



THE POWER OF MINDS

MEETING REPORT AND SURVEY OF SCHOLARSHIP



 **WORLDVIEW** Stanford


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The complex relationship between body, mind and culture has invited intrigue and inquiry since the dawn of civilization. For much of human history, the most successful healers were those who could tap into the power of cultural expectations, spiritual practices, and individual beliefs, and who could convey empathy and trust. Many religious traditions, modern and ancient, feature meditative or contemplative practices that enable greater physical and mental well-being among practitioners. In popular culture, interest in developing growth mindsets in children and employing mindfulness-based stress reduction in adult life is booming. What do these and related practices have in common? Is investing so much power in our own thinking just wishful thinking, or do data support the causal efficacy of our thoughts and beliefs? What do we know about the mechanisms that mediate the interactions between culture, mind and body? And how could we design better interventions to harness the power of minds?

The Power of Minds project collapsed these and related inquiries into a single guiding question that would shape our research, interviews, and conference agenda: How does what we think, feel, believe and cognitively practice influence human health, well-being, and achievement? With this question as our guide, we conducted more than a dozen interviews with scholars across fields ranging from economics to anthropology, neuroscience to public health, and psychiatry to education. We surveyed more than 50 academic papers, popular press articles, and books across a similar breadth of domains, and organized a 2.5 day conference on the Power of Minds at Stanford University in December, 2017 for over 40 scholars and representatives from the two foundations that supported this work. Our interviews are posted in video and/or text at worldview.stanford.edu/media-project/power-of-minds, and our meeting report and survey of the scholarship are presented here.

So what have we learned?

First, scientific findings strongly support the assertion that what we think, feel, believe and cognitively practice has causal influence on human health, well-being, and achievement. The most mature body of evidence – in terms of number of studies and subjects, sophistication and diversity of research designs, insights into mechanisms, and growing clarity about boundary conditions – surrounds the placebo effect and the roles that expectations in general play in the experience of pain. There was also palpable excitement at the conference about brief “wise interventions” in educational contexts, as described by conference participants Greg Walton and Jason Okonofua, which aim to alter mindsets in ways that are psychologically precise and target self-reinforcing behaviors and thought processes that can have long-term effects on academic achievement (and in other domains). These focused interventions that are “wise” to their target populations’ worldviews and lived experiences are proving themselves capable of scaling and translating across more varied contexts, though they continue to be most effective with populations that are vulnerable or marginalized in some way. The literature on mindfulness meditation is mixed, as might be expected in a field fueled by intense popular and commercial interest. However, a number of large randomized, controlled trials suggest that some well-defined mindfulness interventions can reduce physical symptoms of disease, improve cognitive function, and increase quality of life, likely through their capacity to reduce stress, and in some cases, through decreases in inflammatory immune system activity. There is still work to be done on clearly defining mindfulness interventions, and connecting the dots between mindfulness practices, stress reduction, immune system activity, and long-term health effects, but there are some very strong studies in the literature, and the data suggest that further work is warranted.

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Second, the relationships between culture, mind and body are plastic. Interventions that employ hypnosis, hallucinogens or virtual reality provide opportunities to dissociate existing relationships between self and body and then reconstitute those relationships in ways that can diminish pain, fear and anxiety, and alter beliefs and behaviors in sometimes surprising ways. That said, conference participant Mark Hatzenbuehler described other data surrounding the long-term consequences of growing up as a target of social stigma that show that once stigma “gets under the skin,” it primes the mind-body relationship for more intense stress responses that persist even after a person leaves a high-stigma environment for a lower one. Understanding how the architecture of mind-body relationships gets established in early life, and the conditions under which it can be altered through targeted interventions, is a promising horizon for future research, especially as technologies like VR (virtual reality) and AR (augmented reality) become more widely available.

Third, theoretical advances in the way we approach asking questions about the power of minds are opening up new avenues for elucidating mechanisms and designing interventions that have a higher likelihood of success. It helps, said conference participant Nancey Murphy, to understand humans as complex adaptive systems that are constrained by, but not defined by, their biology, and that operate

expectations, etc.) forces. The anthropologists who joined our meeting reminded us that those “top-down” forces often originate outside of a given individual, and that we ought to think of our brains as “encultured” by the social relationships, physical environments, symbols, shared beliefs and behavior patterns that surround all individuals, and of our culture as “embodied,” a process in which human social and cultural experience gets transformed into neural anatomy and physiology.

Fourth, aided by these theoretical advances and the development of new tools and approaches, the search for common pathways and mechanisms underlying the power of minds is bearing fruit. Stress came up again and again as a mediator of the effects of social and cultural experience on the mind and body. Stress has all the hallmarks of a central pathway, in that it has predictable, measureable neural signatures that can be evoked by a wide range of human experience, and in that it can cause changes in activity in the endocrine, cardiovascular, and immune systems, making stress capable of widespread, systemic effects in the body. Stress is also defined by another feature that came up many times throughout the project – recursiveness – that is, the capacity of stress as a mental state to cause perceptible physical changes in the body that then feed back upon the mental state in a way that continues or amplifies the feeling of stress and its effects. Several of our conference participants, including Neha John-Henderson, Anissa Vines, Mark Hatzenbuehler, and Melissa Rosencrantz, discussed their own research, that, taken together, starts to paint a picture of how experiencing racism, social stigma, family conflict, or growing up in poverty or with early trauma can activate inflammatory pathways and exacerbate a range of conditions including obesity, Type 2 diabetes, heart disease, and autoimmune disorders. However, their research also shows that interventions can disrupt the positive feedback cycle of stress, and that individual differences in the way people experience emotion, status, social support, and the beliefs of others can differentially impact their long-term health and achievement.

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on information as much as they do energy and matter. This view directs us away from a search for unidirectional causation, which is especially helpful, said conference co-host Bill Newsome, in organisms whose brain activity and behavior are so clearly shaped by both bottom-up (e.g., molecules, synaptic activity, etc.) and top-down (e.g., goals, beliefs,

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Two other major areas of research activity on pathways and mechanisms deserve to be called out. First, brain imaging coupled with clever experimental design and/or machine learning algorithms that can detect novel patterns is enabling the identification of neural systems involved in mediating the power of minds. Second, some of the most interesting studies we encountered involved the experimental “pulling apart” of complex phenomena. This included Tor Wager’s work on identifying a common “neurologic pain signature” – a brain biomarker of pain that appears to be far more objective than self-report – and Lauren Atlas’s work on the role of expectation in pain, in which she has differentiated a role for the prefrontal cortex in using instructed knowledge (i.e., what you are told) to guide behavior (like avoiding stimuli you are told will be painful), and a role for the striatum and amygdala in helping the brain learn from what you actually experience. Conference co-host Ali Crum’s research further dissects the placebo effect by investigating the roles of two interpersonal factors – perceived warmth and competence – on the mind and body during administration of a placebo; this work can help explain some of the individual and contextual variability in eliciting placebo responses. In our literature review, we learned that hypnosis can elicit different patterns of brain activity depending on the exact instructions, e.g., “your pain will not bother you” versus “you can reduce pain by focusing on a competing sensation.” And in a review on the neural mechanisms of mindfulness meditation, the authors identified its three major cognitive features and the brain regions that likely mediate them: attention control (anterior cingulate cortex and striatum); emotion regulation (multiple prefrontal regions, limbic regions, and the striatum); and self-awareness (insula, medial prefrontal cortex and posterior cingulate cortex and precuneus). These and other studies that are doing the hard work of pulling apart complex phenomena to understand their mechanisms, influences, and boundary conditions will be incredibly valuable in building bridges and designing interventions in the future.

Fifth, we hope that another locus of cross-disciplinary research is emerging to focus on human meaning-making – the conscious narratives and subconscious beliefs and expectations that we all hold, and which have enormous potential to shape our biology, behavior and social interactions. Conference participant Anthony Burrow told us about his work on purpose, which shows that a sense of purpose can provide a buffer against stressors in daily life, and predicts longer lifespans and higher earnings. Amy Krentzman discussed her research on 12-step programs like Alcoholics Anonymous that shows that adopting a narrative of self-forgiveness and forgiveness of others seems to be a critical component in recovery. Rebecca Seligman described her studies of transformation in an Afro-Brazilian religion, in which participants reframed past traumas as spiritual callings, and in which individual and community narratives about rituals they participated in allowed them to experience healing and transformation without violating their core sense of identity. In conversations about wise interventions and the long-term effects of social stigma, we came around again and again to the importance of belonging, and to interventions that aim to increase the sense of belonging, and thereby influence a cascade of behaviors, decisions, interpretations, and internal experiences. More work, especially across disciplines and contexts, is needed to better understand how we develop the narratives about ourselves and others that have the greatest power to affect meaningful outcomes in human health, achievement, and well-being, and to identify the most critical elements in interventions that can re-shape the stories we tell ourselves.

Sixth, interventions at the community level, or at multiple levels that include individuals, families, caregivers or teachers, and communities, show strong promise for conducting mindset interventions at scale - and with potentially stronger effects. In our survey of scholarship, we found relatively few interventions that aimed to improve health, well-being or achievement by intentionally intervening at the community

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level, or at multiple levels including the community. However, several of our conference participants shared stories of community-level interventions that hit upon the same themes that emerged as critical from smaller experimental settings, like belonging, purpose, empathic social interactions, stress reduction, and purposeful reshaping of narratives. The multi-level interventions we describe in the Survey of Scholarship did the same. The inclusion of these themes was not always articulated at the outset by the designers, but the commonalities our participants observed across levels suggest clear paths forward for community-level design.

The Worldview Stanford team started this project as skeptics, and we retain that skepticism about some of the grandest claims about mindset interventions and practices, especially in applied, for-profit settings. However, the body of research we reviewed and the conversations we had one-on-one and at the conference leave us convinced that there is indeed a “there” there in ascribing great power to our thoughts, feelings, beliefs and cognitive practices to influence our health, well-being and achievement. *Perhaps most encouraging was the intense conversation at the conference that focused on ways to expand our knowledge, help us ask better questions, and design better interventions.* These included:

- »Breaking down academic silos, and convening more cross-disciplinary dialogues like the Power of Minds conference, which should also include practitioners in future conversations
- »Working together to create and share better, larger, more diverse datasets that will enable new forms of study design
- »Thinking creatively about how to study populations that have not been included in earlier research, like the millions of people in addiction recovery programs who seem to disappear from much active research after the initial phases of recovery, or about how to conduct natural experiments by analyzing population-level data before and after events like the passing of new legislation or high-profile court decisions

- »Encouraging each other to use more rigorous experimental designs, pre-register experiments, describe interventions in much greater detail, and share raw data
- »Hearing the concerns of experts in some fields, like public health, who are deeply concerned that focusing on mindsets will deflect attention from structural causes of inequality and lead to explanations that blame the victim for their own problems
- »Changing our own mindsets, especially when it comes to the way we think about mental health, which for too long has focused on an impoverished definition of mental health as the absence of mental illness, and ignored the attributes and subtleties of flourishing human lives
- »Working more collaboratively with communities, practitioners, and user experience designers to create studies and mindset interventions that are respectful, wanted, inclusive, effective, and scalable
- »Being more proactive in sharing what we know and what we are learning with public audiences, and in vetting the claims of practitioners and programs who pitch their interventions to the public

We are only beginning to fully understand the power of minds, but we can report that the group of scholars we engaged and many of their colleagues have laid strong foundations for future research and innovative intervention design. We hope the findings reported here will encourage future investment, more research activity, and especially, cross-disciplinary and public engagement about what we know and still have to discover about the power of minds.



The enigma of the conference at Stanford University began with its name: The Power of Minds. Its description only deepened the mystery: “The complex relationship between body, mind, and culture has invited intrigue and inquiry since the dawn of civilization, yet our understanding of these relationships and how to intervene in them for positive ends remain fragmented and disconnected.”

“How does what we think, feel, believe, or cognitively practice influence health, well-being, and achievement?”

And when the invites went out, more than a few of the attendees confessed to wondering: Why are you emailing me?

Things were going exactly as planned.

“I find that every good conference starts with people wondering why they’re there,” said Matt Trujillo, a program officer with Robert Wood Johnson Foundation, which supported the Worldview Stanford-produced convening along with the Templeton World Charity Foundation and the Stanford Neurosciences Institute.

“Oftentimes the conversations around minds, mindsets, community, and social determinants are happening in different rooms, in different silos,” he said. “Our goal is to try and break down the silos.”

It would be a busy demolition project with so many silos present. Attendees came from disciplines that included neuroscience, psychology, anthropology, sociology, epidemiology, public health, social work, psychiatry, pediatrics, internal medicine, divinity, theology, and philosophy.

More than a dozen fields. Nearly 40 scholars. Ten presentations and panel discussions. And one central question: How does what we think, feel, believe, or cognitively practice influence health, well-being, and achievement?

Over two and a half days, the researchers traveled up and down a ladder of truth-seeking that ran from neurons in the brain to the cultural forces of communities that shape who we are.

Their journey began with three presentations on *Culture-Mind-Body: A Scientific Introduction*. Next came panel discussions on *Human Flourishing*, *Innovative Interventions*, and *Exploring Emotions*. The second day opened with four presentations on

Mechanisms of Mind-Body Interactions, followed by panels on *The Roles of Religion and Spirituality*, *Culture and Context*, and *The Influence of Community*. The final morning was spent in conversation, beginning with *Insights from*

Individual Practice. It ended with *Emerging Patterns*, when the scholars tried to weave their wide-ranging conversations into ideas for the next step of investigations into culture-mind-body interactions.

This meeting report leads off with short summaries of the eight sessions that featured presentations and panels. Those served as the catalysts for rich, engaging, and wide-ranging conversations, out of which emerged a set of cross-cutting themes that are highlighted in the concluding section. The appendix includes: the full meeting agenda; participant biographies; a glossary that offers definitions, both in context and from external sources; a list of resources compiled onsite. Also included is a list of media (short scholar videos and written Q&As), produced prior to and during the meeting.

WHY THE POWER OF MINDS?

Brie Linkenhoker, a neuroscientist and director of Worldview Stanford, welcomed the participants to The Power of Minds. The idea for this conference, she explained, reflects an upsurge of academic research and public interest in the connection between mind, body, and culture, driven by a recognition that today’s significant challenges in human health and well-being cannot be addressed by biomedical advances alone.



"For the next two and a half days," Linkenhoker said, "we are gathered to explore the causal nature of our thoughts, feelings, and beliefs and the interventions and practices that can harness their power to positive ends. Our goal is to share what we know, what we don't know, and what we want to know; to discover surprising connections across disciplines and scale; and to identify new and promising avenues for future inquiry."

Bill Newsome, a professor of neurobiology and director of The Stanford Neurosciences Institute, explained why he signed on to co-host the meeting. Having practiced "reductionist neuroscience" in the lab for 40 years, Newsome has become increasingly convinced that we are both top-down and bottom-up creatures, influenced by neurons and beliefs alike. "Understanding the nature of this integrated view of human beings and ultimately how it gives rise to freedom and responsibility, is, I think, the most important problem facing the neuro-behavioral sciences," he said.

MIND-BODY-CULTURE

Alia Crum, assistant professor of psychology at Stanford and the third conference co-host, led off a

set of presentations designed to frame the domains of mind, body, and culture. Crum's research focuses on how and why a change in mindset can affect health, achievement, motivation, and other outcomes. She began with the story of Lupe, an overweight hotel maid with hypertension, who had been advised by her doctor to lose weight and to exercise. In Crum's study, Lupe and more than 80 other maids, were given an intervention that reframed their work as good exercise. After this shift in mindset, the maids reported getting more exercise (without any change in behavior) and registered significant drops in weight, body fat, and blood pressure.

In another study, participants were given milkshakes with the exact same caloric and nutrient content. Half were told that their shakes were sensible and low calorie, while the other half were told that their shakes were rich and "indulgent." The participants who believed they had consumed the indulgent shakes experienced a significant reduction in gut peptide ghrelin, which regulates hunger and metabolism. Crum is currently researching how mindsets about the debilitating (vs. enhancing) nature of stress become self-fulfilling and how physician behavior (e.g., showing high or low warmth and competence) affects patient outcomes.

In summary, Crum explained, just as mindsets shape our motivation, attention, affect, and physiology, so are mindsets shaped by cultural norms and practices, institutions, social interactions, and language. Both as a scientist and as a co-host of the meeting, Crum identified three important questions that she hoped the meeting would explore: "Where do mindsets matter?



If we see it in medicine, where else? How does it work? What are the mechanisms? And perhaps most importantly, what can we do as individuals, as doctors, as cultural scientists to leverage the power of minds to improve our health and well-being?"

Tor Wager, professor of psychology, neuroscience, and cognitive science at the University of Colorado, Boulder, opened up a vast body of research on pain and placebo (a substance or treatment with no therapeutic effect). Wager is trying to tackle two problems related to the power of minds: 1) How do we objectively measure something like pain that is fundamentally subjective, when each of us can only access our own experience and the self-reports of others? And 2) how can we tease apart aspects of an experience like pain that are more bottom-up (defined by the movements of electrical signals from receptor to brain) from the aspects that are malleable (influenced by top-down beliefs and expectations)? If we are to design effective interventions that take advantage of the power of minds, we need to be able to separate and understand these contributions to a unified experience and their interactions.

Wager described an approach that utilizes machine learning to look at large sets of brain imaging data captured during the experience of pain in the laboratory. He used this approach to define the "neurologic pain signature," which is an attempt to define a biomarker of objective pain that can

be assessed across subjects and used as a dependent measure of the effectiveness of a wide variety of interventions to reduce pain. "We need better targets for testing placebo effects, psychological interventions, drug interventions, and social interventions," he said. "If we just say the anterior cingulate cortex was affected, that could mean anything. We need to find something that tracks pain intensity, for example, very closely, and doesn't respond to emotional manipulations – it needs to have a very narrow physiological profile or psychological profile in terms of what it's tracking."

Mark Hatzenbuehler, associate professor of socio-medical sciences and sociology at Columbia University's Mailman School of Public Health, talked about his research on the impacts of growing up as a stigmatized individual within society because of race, ethnicity, or sexual orientation, and how that experience gets "under the skin" to affect long-term health. Stigma is structural in that it's promulgated and reinforced through our social institutions and laws. Yet stigma is more than a feature of public policy or even the sum of the experiences a stigmatized person has. It is especially pernicious because of the way it activates and maintains individual mindsets, which can then feed back into a vicious cycle that further internalizes stigmatizing ideas and self-concepts.

Hatzenbuehler's unique take on studying stigma uses a wide variety of methods, which could be a good guiding principle for studying the power of minds. Drawing on population-level data sets on morbidity, mortality, and mental health, he uses quasi-experiments to look at the impact of a significant event. For example, how does the passage of state legislation banning gay marriage affect the health and well-being of gay people before and after passage, and how do those effects compare to those of matched groups in other states in which no legislation was passed? In the laboratory, he also compared students who had grown up in high-stigma environments to those who had grown up in low-stigma environments (all of whom were living in low-stigma environments at the time of the experiment) to examine their responses to a classic laboratory stress test. These and other studies offer

“Where do mindsets matter? If we see it in medicine, where else? How does it work? What are the mechanisms? And perhaps most importantly, what can we do to improve our health and well-being?”

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strong evidence that “The stress of growing up in these high structural stigma environments may be exerting biological consequences similar to other chronic life stressors,” which can increase morbidity and mortality.

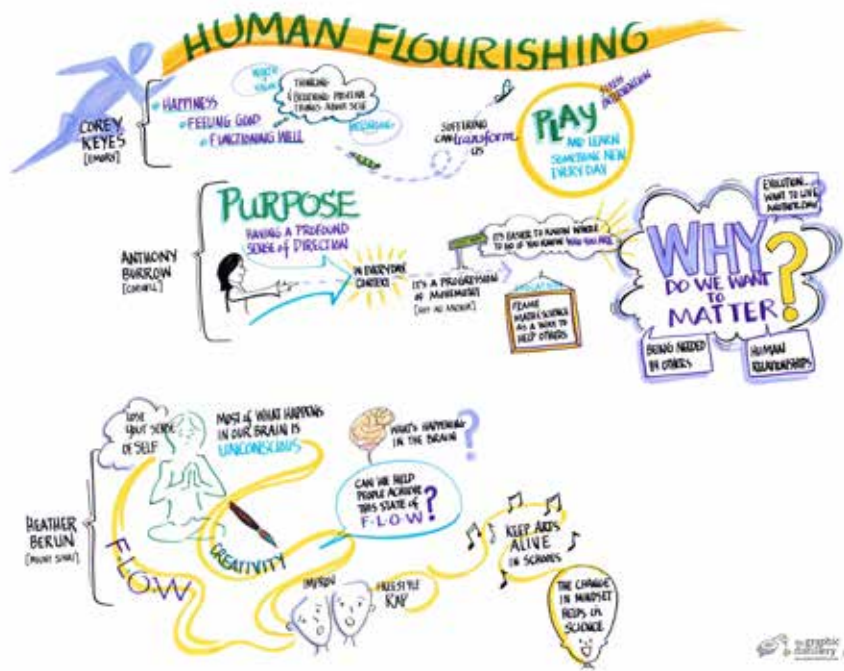
HUMAN FLOURISHING

Corey Keyes, professor of sociology at Emory University, started this panel discussion with sobering statistics on the rise of mental illness globally and his

problem category, which is where more of the world exists. That is, they're not flourishing, they're not depressed, they're not mentally ill. In our studies, those are the people who are at the greatest risk of missing more days of work, becoming mentally ill, and dying prematurely.”

Psychologist **Anthony Burrow**, associate professor in the Department of Human Development at Cornell University, studies the role of purpose. If you have a sense of purpose, he says, even if that purpose is not completely clear, it can provide direction and make you more future-oriented. “Simply being asked questions about purpose has value, but somebody who lacks a consolidated sense of identity could be very frustrated by it.”

Purpose can also provide a buffer against the daily stressors of living in a diverse world. In studies Burrow conducted in Chicago, subjects were given a brief, life-purpose writing exercise followed by questions about mood as they rode around the city on trains on which the ethnic diversity of passengers varied. “We live in an increasingly diverse society, which most of us tend to value,” Burrow said. “But psychologically, it's not an easy context to navigate. The world starts to break down a little bit. We lose social capital. We lose trust. We psychologically unravel in those spaces. This might be a context in which something like a sense of purpose could have real power and real value.”



own personal experience with depression. Flourishing, he said, “is not about the absence of illness or mental illness; it’s an alternative to treatment.” It’s about being part of a community, contributing things of worth and value, and believing you can do so. Yet scientists and medical practitioners pay far too much attention to the lack of human flourishing, and not nearly enough to what flourishing itself looks like. That is why Keyes has simply flipped the 11 DSM symptoms of depression to describe its flourishing opposite. “The things that lower the bad do not necessarily increase the good,” Keyes warned. “If we cure everybody with depression tomorrow, what we may have only done is move them into another

Heather Berlin, a cognitive neuroscientist and assistant professor of psychiatry at the Icahn School of Medicine at Mount Sinai, talked about understanding the experience of creativity and flow. Her current research involves freestyle rappers and comedy and jazz improvisers. “When people are in these flow states they feel like they lose their sense of time and place and self, like it's coming through them from somewhere else. It's associated with very positive emotions. People strive to get to these states. It's about letting go of that sense of self-awareness, decreasing dorsolateral prefrontal cortex activation, allowing for that flow of information. Like there's a neural signature for pain, is there a neural signature for improvisation, for creativity, or flow state, whatever you want to call this?”

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Understanding what happens in the brain during flow states could allow us to design interventions to evoke these states, and to better understand how and why they contribute to human flourishing. In a similar vein, Berlin studies individuals who are able to achieve extraordinary things – like holding their breath underwater for lengthy periods or withstanding extreme amounts of pain – and measuring their neural and physiological effects in the process. She is intrigued by how much we still don't know – or know how to unleash – about human potential

INNOVATIVE INTERVENTIONS

Greg Walton, associate professor of psychology at Stanford, talked about the uniqueness and im-

portance of wise interventions, which he described as being “wise to the meanings that people make about themselves, about other people, about social situations, that then have powerful effects on how people behave in those particular situations... That's different from many other kinds of approaches to social reform that are predominant in our society, which often focus on objective qualities of people, like their abilities or their self-control, or on objective qualities of social situations, like resources and incentives.”

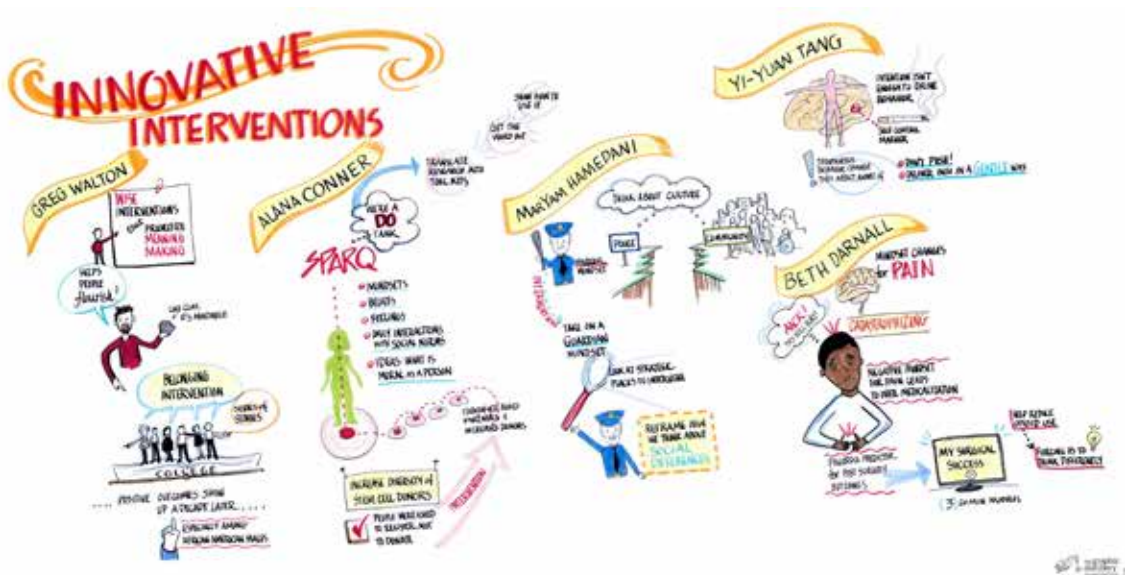
Cultural psychologist **Alana Conner** is the executive director of SPARQ (Social Psychological Answers to Real World Questions), which she described as a “do tank,” not just a think tank. Conner raised fundamental questions about how to translate research in academic settings into usable, practical

interventions – the last mile problem. She described one early SPARQ project that changed the culture and narratives of a stem cell donor registry. “At the institutional level they were not interested in the outcomes that were actually relevant to saving people's lives,” she said. “The mission was about policies, procedures, and processes. Very little attention was being paid to getting people to the finish line.” SPARQ help them to shift focus from simply registering people to encouraging follow

through, based on understanding and tapping into the reasons why people want to donate stem cells in the first place.

Conner emphasized the value of identifying questions to study through dialogue with real world practitioners, like teachers or police officers or managers, and then making the results actionable and scalable through “tool kits” and other mechanisms.

Yi-Yuan Tang, professor of psychological sciences and internal medicine at Texas Tech University,



portance of wise interventions, which he described as being “wise to the meanings that people make about themselves, about other people, about social situations, that then have powerful effects on how people behave in those particular situations... That's different from many other kinds of approaches to social reform that are predominant in our society, which often focus on objective qualities of people, like their abilities or their self-control, or on objective qualities of social situations, like resources and incentives.”

discussed his use of integrated mind-body training – “helping participants, including those in healthy populations, enter a special brain state” – to address problems like obesity, hypertension, depression, and addiction. In particular he is interested in interventions that not only change behavior but also change brain states and reshape brain networks.

In a mindfulness intervention with students who smoked, the intervention did not focus on smoking at all. “Based on many studies,” he said, “indicating the intention itself may not be enough to change behavior.” Instead, the intervention aimed to evoke a state of awareness of body, breathing, and receptivity to external instructions. He hypothesized that in situations in which behavior change is perceived as very challenging, it may be most helpful to design interventions that generally increase the capacity for self-regulation without a focus on the behavior in question. After 10 sessions, 60% of the participants smoked less and 30% quit totally, without awareness or an explicit motivation. “That suggests we can change the body-mind state and induce spontaneous behavior change.”

MarYam Hamedani, senior research scientist at SPARQ, discussed several multi-level “culture clash” interventions. The first, based on ongoing work with the Oakland, CA police department, is aimed at helping police officers “take on more of a guardian mindset or a protector mindset than a warrior

mindset. How do we also get them to think about how these issues are rooted in their communities, and how they can be a part of their communities, not simply an entity that’s separate and apart?” Changing these mindsets – and being trained in specific behaviors that support it – can improve interactions between officers and community members, and enhance everyone’s safety.

In other research with first generation college students, reframing social difference as an asset, not just a challenge, closed the achievement gap. Knowing how to intervene is one challenge, Hamedani said, but knowing when to intervene is equally important.

Beth Darnall, a clinical professor in the department of anesthesiology, perioperative, and pain medicine at Stanford, discussed the phenomenon of “pain catastrophizing” and the interventions she has designed and scaled to change people’s expectations and experiences of the realm of pain management. Pain is one the most powerful predictors for post-surgical outcomes, and it’s also fueling the ongoing opioid epidemic in the U.S. “When a person is catastrophizing they’re literally begetting the thing they fear,” she said. But by changing patients’ mindsets— their thoughts, beliefs, and expectations— about pain, they are better able to manage pain, and experience improved surgical outcomes.

Darnall’s brief, low-cost mindset intervention programs have proved successful with breast cancer surgery patients and are now being tested in orthopedic trauma cases, with the hopes of reducing opioid use and dependence. “We know that when we treat brain catastrophizing using psychological treatments that we can reverse these changes in the nervous system,” she said. “We can literally increase volume in regions of the brain associated with pain control. The mechanistic science is there. The question is how do we make these treatments accessible and scalable and how do we optimize them for the general public?”

“When we treat brain catastrophizing using psychological treatments we can reverse these changes in the nervous system... The mechanistic science is there. The question is how do we make these treatments accessible and scalable...”

EXPLORING EMOTIONS

Adam Anderson, associate professor of human development at the Human Neuroscience Institute at Cornell University, discussed his neuroscience research on emotion in the context of the very personal – and emotionally wrenching – experience of having cancer. This experience, he says, forced him to ask new questions about what the brain can know about the body, and how we can consciously

Oz Ayduk, professor of psychology at the University of California, Berkeley, discussed the ways we deal with negative experiences, especially relational ones. “So we have this paradox. Under certain conditions, self-reflection – focusing on your emotions – is good; under other conditions, self-reflection is clearly bad. What are the determinants that tell us when it's good and when it's bad?” Ayduk studies the strategies we can use to acknowledge and learn from our emotions without excessively

ruminating on them. “Rumination is this passive cycle of thinking about the reasons and causes of your emotions, or emotional states, which precipitates and maintains depression,” she explained. “When people ask ‘why?’ that’s when they go abstract, they overgeneralize, and that’s what causes depression.”

On the other hand, self-distancing – stepping back and thinking of selves that



access more of that knowledge. Our “objective” forms of information about our bodies and the world exist alongside our “subjective” information – including our feelings and emotions.

Anderson asked us to understand emotions not just as brain-body states or as a consequence – as in, I see something in the world, and then I feel something – but as a set of cognitive phenomena that can influence other critical cognitive processes like perception and attention, both of which can directly impact how we see and experience the world. “Coming from two perspectives,” he said, “I’ve done work from the brain down – mindfulness training, attentional training – trying to understand how we come to know our bodies, and from the bottom up too. I’ve become more and more interested in the body and how that information is represented in the brain.”

are different from the current self – can down-regulate negative emotions and produce measurable psychological and neural effects. This may take several forms: visual (e.g., being a fly on the wall); temporal (e.g., imagining yourself 20 years in the future); linguistic (e.g., referring to yourself in the third person). All of these help highlight emotions’ temporary and impermanent nature, and can help people move on from negative experiences.

Erick Ramirez, professor of philosophy at Santa Clara University, talked about his work on empathy and shame. In part, this work came out of his early research on psychopaths and emotions. Both empathy and shame, he said, are rooted in moral concepts that “are not only social, but affective, emotional.” Ramirez explained that “shame can do something that no other moral emotion – guilt,

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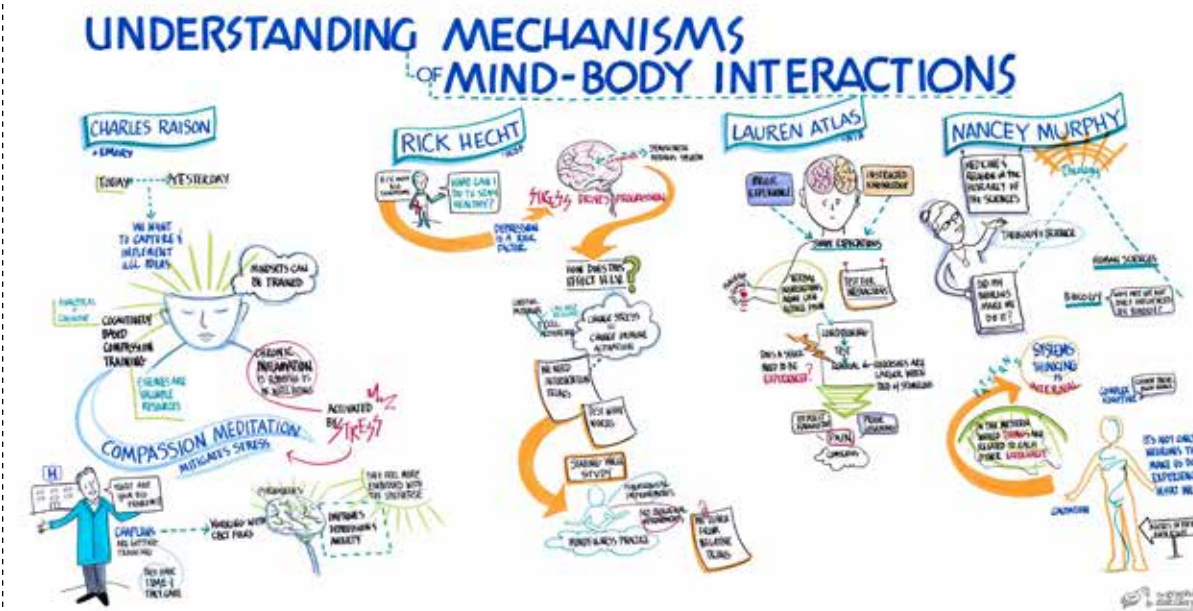
anger, disgust – can do, and that's focus on our character."

He described how the experience of shame can be helpful or harmful, depending on what aspect of one's self is the object of shame. Shame targeted at characteristics that you can't change – like race, gender, economic background – is not helpful compared to shame targeted at malleable features of character, like being a jerk, which can be changed. This type of reintegrative shaming was a key component of South Africa's Truth and Reconciliation Commission following apartheid and is being used successfully in criminal and juvenile justice settings. Said Ramirez, "it gives both victim and offender a chance to deal with each other as

sin-Madison and director of research in spiritual health for Emory University Healthcare, began by asking questions prompted by the previous conversations: "How can we induce natural, spontaneous, positive change in the brain and body by 'freeing' up the brain, perhaps by deactivating frontal regions to let deeper brain activity emerge?" Raison said he was struck by the powerful causality in existing systems within the body that new interventions could target, especially if they were informed by ancient mindfulness and meditative practices that may function as deep brain stimulators.

He went on to discuss the critical role that inflammation – especially long-term chronic inflammation – plays in a host of maladies, including

depression, and the strong links between stress and inflammation. Early life abuse or neglect seems to train the body to have outsized stress responses long into adulthood. Yet findings from a study of a CBCT (cognitively based compassion training) intervention with college students suggested that practice can train the body to reduce stress responses. Raison and his colleagues at Emory are now developing a set of CBCT



human beings, unlike our traditional, guilt-based, retributive justice system."

MECHANISMS OF MIND-BODY INTERACTIONS

The second day of the conference opened with a quartet of brief presentations on mechanisms.

Chuck Raison, professor of psychiatry in the School of Medicine at the University of Wisconsin-

Madison and director of research in spiritual health for Emory University Healthcare, began by asking questions prompted by the previous conversations: "How can we induce natural, spontaneous, positive change in the brain and body by 'freeing' up the brain, perhaps by deactivating frontal regions to let deeper brain activity emerge?" Raison said he was struck by the powerful causality in existing systems within the body that new interventions could target, especially if they were informed by ancient mindfulness and meditative practices that may function as deep brain stimulators.

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forest fire,” involving the restructuring of narratives, neural circuits, and the lenses through which we see the world.

Rick Hecht, research director at the Osher Center for Integrative Medicine and professor of medicine at the University of California, San Francisco, also emphasized the critical role of stress in mediating interactions between the brain, body, and world. His interest was sparked as a young medical resident in San Francisco right after the first HIV test was developed. A former IV drug user asked Hecht, “What do I do to stay healthy?” Hecht could name the drugs to address the symptoms of AIDS, but not the practices that would actually work to keep this patient healthy.

Hecht presented data from a series of studies demonstrating that stress, even more than depression, predicted more rapid progression of HIV as tracked by the loss of CD4 T cells. In searching for the mechanisms by which stress could change T cell counts, he found that the HPA (hypothalamic-pituitary axis) plays a key role in regulating cortisol, a potent immunoregulatory hormone. He also noted direct anatomical connections between the brain and our lymph nodes, which could mediate very fast neuro-immune interactions. Hecht now thinks that constant stress “burns the immune system out,” making it less and less able to replace CD4 T cells as they are lost to HIV.

Hecht concluded by talking about the Staying Well intervention study, which he co-authored. HIV-positive men who still had relatively high T cell counts were assigned to an MBSR (mindfulness-based stress reduction) intervention group, or to a health education group with a strong facilitator and similar levels of attention and social interaction. The MBSR group showed reductions in experienced stress and depression relative to the education group (as hypothesized), but no difference in CD4 T cell counts. Hecht said this study serves as a reminder that translating knowledge about mind-body interactions into interventions remains challenging. “We have to think that negative trials are okay,” Hecht said. “We need to learn from them. We have to expect that we’re going to get them.” It’s also

critical that researchers define their hypotheses and dependent variables ahead of the study as a means to collecting stronger data to share with the field.

Lauren Atlas, an investigator at the National Center for Complementary and Integrative Health, uses fMRI imaging to examine the role of expectations in mediating the placebo effect. Specifically, Atlas aims to pull apart the roles of prior experience and instructed or explicit knowledge in shaping our expectations so that we can better design interventions that will work for different patients. She described an emerging “dual process model” in shaping expectations, in which the prefrontal cortex plays the major role in maintaining higher order knowledge like rules and in guiding behavior based on conceptual knowledge. Meanwhile, the striatum and amygdala mediate reinforcement learning about which cues predict which outcomes. Both of these systems, she says, show increased activation with placebo. Previous studies have shown that instruction can override experience in shaping the pain the subject reports, while experience seems the more potent influence on cortisol and growth hormone, suggesting that there may be distinct conscious and subconscious effects of the placebo effect.

Atlas presented findings from her own study on the relative roles of information and recent experience in shaping expectations and experience of induced pain. She showed that the striatum and the ventromedial prefrontal cortex showed consistent, appropriate reversals upon instruction, but the amygdala responded with a pattern suggesting that it needs actual reinforcement experience in order to update its model of what to expect. “Understanding and trying to tease apart these potential interactions helps us gain some insight on how things like exposure-based therapies versus cognitive therapies might be working to help different types of patients in the clinic.”

Nancey Murphy, professor of Christian theology at Fuller Theological Seminary, offered a more theoretical approach to understanding the mechanisms that underpin the interactions between culture, mind, and body. Murphy described advances in

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her thinking (with her colleague, Warren Brown) about a non-reductive account of human experience that integrates bottom-up drives and associative learning, as well as the top-down influences of our own beliefs and desires. Her understanding has been shaped by Alicia Juarrero's book, *Dynamics in Action: Intentional Behavior as a Complex System*, which asks a key question about human agency: "How are we to explain why we're not just passive players influenced from 'below' by our biology and from 'above' by our environments?"

The answer lies in complex-systems theory, which asks us to shift from thinking about humans as being made of things (atoms, organs, etc.) to being made of systems and processes. Going one step further takes us to *complex adaptive systems*, which have the capacity to select their own goals and adapt to new circumstances. "Humans," Murphy said, "are complex, self-organizing, dynamic, adaptive systems — and are partially decoupled from

in their own right." These systems operate on information as much as energy and matter; moreover, relations between parts of the system operate probabilistically within constraints, rather than as efficient products of unidirectional causation. Adopting the complex adaptive systems model, Murphy says, can help us ask better questions about mechanisms and causation at the intersection of mind, body, and culture.

ROLE OF RELIGION AND SPIRITUALITY

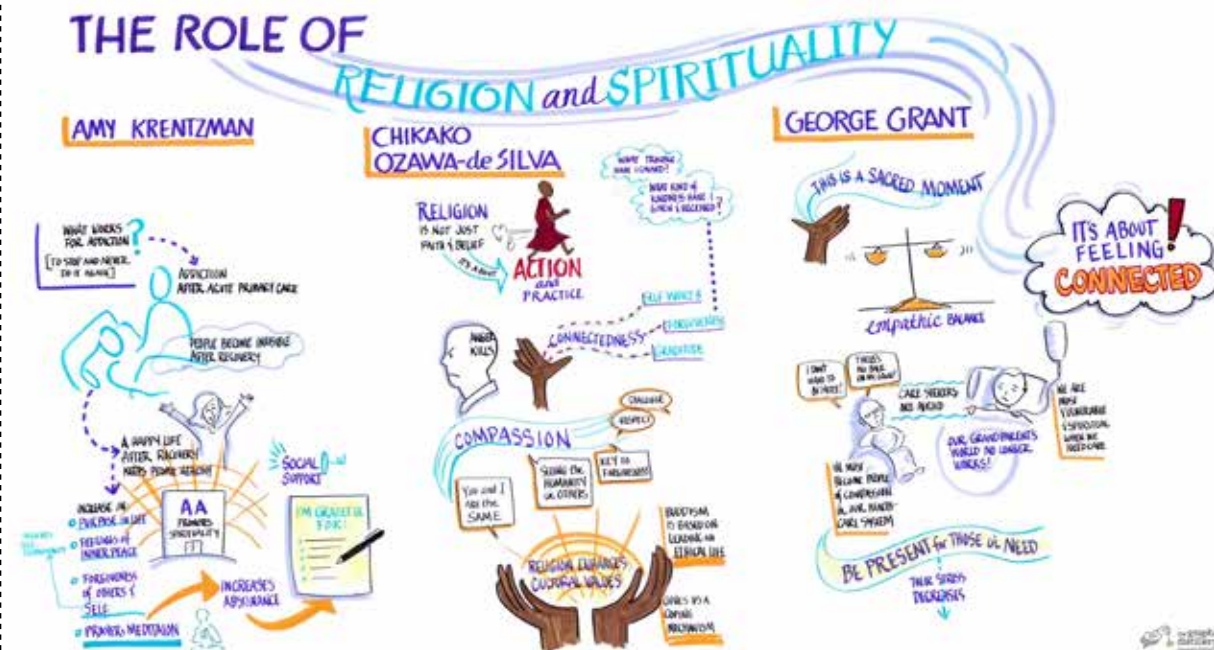
Amy Krentzman, assistant professor at the School of Social Work and at the Center for Spirituality and Healing at the University of Minnesota, studies addiction recovery, especially alcohol use disorders. She sees recovery as a life of flourishing; "I use the Betty Ford consortium definition, which is,

'Abstinence from the addictive behavior, plus increases in quality of life, and other life activity.'" When people are happy and fulfilled, they are less likely to relapse, which is where spirituality and religion become relevant. The peer recovery program Alcoholics Anonymous, for example, is spiritual and theistic (acknowledging a higher power), but not religious (choose any higher power).

In Krentzman's three-year study, people in recovery from alcohol-use disorders experienced significant

their biology. They attend selectively to environmental constraints, and thus are able to become agents

increases in spirituality on average while a majority decreased in religiosity. Her research has also



found that people in recovery experienced increased spiritual changes, such as greater purpose in life, forgiveness of self and others, and practices of prayer and meditation. Among those in AA, two factors were significant in mediating drinking and maintaining abstinence: social support of those in abstinence, and prayer and meditation. Gratitude also appears to make a difference; people in treatment who were assigned a “Three Good Things” daily gratitude exercise experienced increases in unactivated positive affect, feeling calmer, and more at ease.

Chikako Ozawa-de Silva, associate professor of anthropology at Emory University, studies the cross-cultural experience of mental illness and well-being. Religion, she says, is not just a function of beliefs in the mind, but of action and practice. Buddhism, for example, “is a practice of mental hygiene,” based on understanding the nature of the mind and of human suffering and its alleviation. Buddhism’s focus on compassion and forgiveness has been adapted as a secular intervention in CBCT (cognitively based compassion training). “Compassion,” said Ozawa-de Silva, “is often considered

an emotion; it is actually a set of conceptual skills that needs serious cultivation.” That’s why CBCT has eight different steps that highlight human interdependence, foibles, and shared motivations that help practitioners relate to the humanity of others. In Ozawa-de Silva’s research with suicidal people, both CBCT and the Japanese introspective practice of Naikon increased the sense of connectedness, self worth, and forgiveness.

Religion is not strictly an individual affair, she said. Neither persecuted Tibetan communities nor Japanese earthquake survivors have experienced high levels of PTSD, depression, or despair. Their shared moral values and mindsets, which emphasize acceptance over anger, provide different coping mechanisms. “If religion can lift up the social and cultural values facilitating more resilience and mental well-being,” she said, “compassion could be a key to more dialogue, respect, help, and forgiveness.”

George Grant is a psychologist and the executive director for spiritual health at Emory University. A self-described “post-religionist renegade,” he is revolutionizing the hospital chaplaincy in what is a very distressing and lonely health care delivery system. This has meant flipping the traditional chaplaincy model to one that’s now 25% religious care and 75% care of emotional distress. Accepting what’s happening and being fully present for and accepting of each patient, their needs, and their power requires a new, compassion-based discipline of both self and others, which is why Grant trains everyone in CBCT.

“If I can sum up my work in one quote,” he said, “it is ‘Discomfort with discomfort is discomforting.’” I take seriously that people working in healthcare delivery need to be engaged with their own narratives, their many mindsets. We need to incorporate our own sense of self and become people of self-compassion so that the other person can feel figuratively held, and not succumb to their own fears, but actually embrace coping from within.

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CULTURE AND CONTEXT

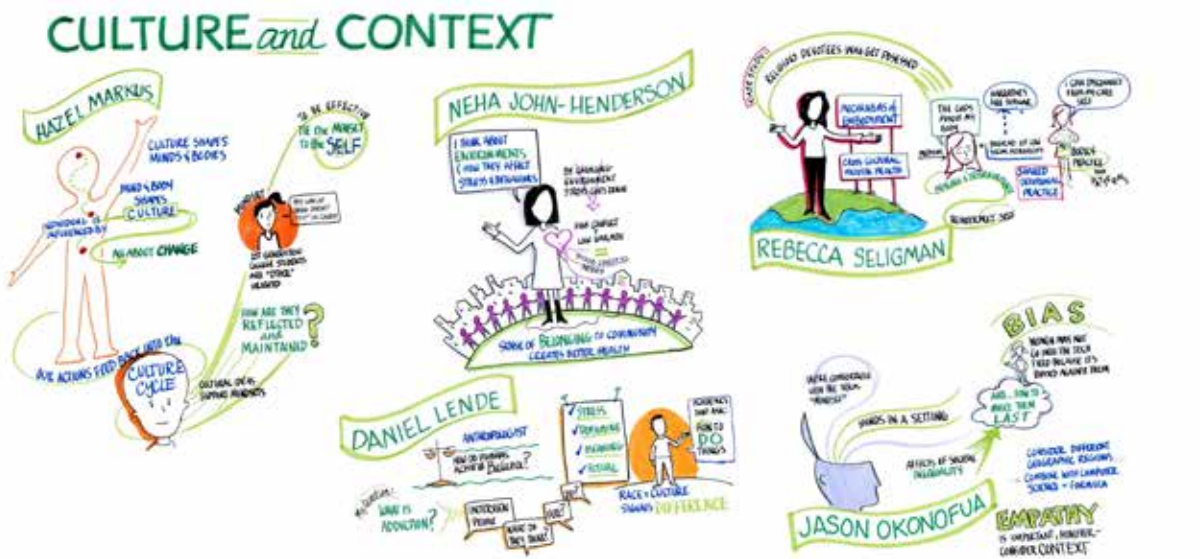
Hazel Markus, professor of psychology at Stanford, focuses on how cultures shape minds and bodies and in turn, how minds and bodies create and shape cultures. The best way to create or change a mindset, she said, is by having that mindset scaffolded by the culture cycle and maintained collectively. Markus cited two studies to illustrate this dynamic. First generation college students often struggle because they arrive with an “interdependent” other-oriented mindset, seeing themselves as part of a whole (e.g., family or community). That clashes with

financial independence” or better yet, “to help your family and people you care about most” – the grants were accepted and also spurred enrollment in financial literacy classes.

Daniel Lende, associate professor of anthropology at the University of South Florida, aims to integrate neuroscience and anthropology to address anthropological questions. This “brains in the wild” approach uses field-based data to compliment and critique data coming from the clinic and labs. His own research focuses on addiction, which he sees as having four components: “stress, dopamine,

meaning, and ritual.” Building rich data sets based on participant observation and deep interviewing about what people in addiction think, feel, and experience have enabled Lende to augment neuroscience models of addiction focused on wanting and seeking drugs.

Lende also emphasized the importance – and difficulties – of translating academic research into public impact and value, and proposed that



the prevailing “independent,” self-contained mindset held by the vast majority of students. While the first gen students can learn independent skills and strategies, they are more successful if the university also supports interdependent approaches.

Another study in Kenya aimed at poverty reduction gave families “basic income” grants. Resistance was high when people were told the grants were to alleviate their poor, sad situations – a rationale that was socially stigmatizing in the community. But when the money was offered for non-stigmatizing purposes – to “think about your goals to achieve

the power of minds at the conference take up that challenge. "We want to create systems whereby we can go that final mile, by which we can build up from the mechanisms to make a difference in the world."

Neha John-Henderson, assistant professor of psychology at Montana State University, examines how social interactions combined with economic and family environments early in life affect how minds and bodies react to stress. Her early studies showed that people raised in low SES environments have exaggerated inflammatory responses and

heightened vigilance to stress – effects that can be mitigated by social support. In addition, adults raised in high-conflict, low-warmth environments had thicker carotid artery walls – an early indicator of heart disease risk.

Her current research focuses on the Blackfeet Tribal Community, which experiences disproportionate rates of trauma, disease, and suicide. Individuals with high early life trauma showed higher levels of chronic inflammation, but those who felt strongly connected to the community had significantly lower levels. That sense of belonging to the community appears to be protective for tribal students coming to larger universities as well, resulting in “lower levels of inflammation; better sleep, social interactions, and perceptions of university at large; and less perceived discrimination...these factors in the environment and context can really shape these outcomes in ways that can affect health.”

Rebecca Seligman, associate professor of anthropology and global health at Northwestern University, described fascinating research on the health and social impacts of spiritual possession. She studied people in Brazil who believed they had become possessed by deities from a higher spiritual plane. “These mediums, most of whom had backgrounds of significant psychological and physical distress, reported having a profound experience of healing

and self-transformation in relation to this practice,” Seligman said. “One of the most important parts of the phenomenon to me is the revelation that a cultural system – this religion – is a repository of mindsets.”

Many elements suffused the ritual with transformational power, Seligman noted. Participants reinterpreted past traumas as signs of a spiritual calling, a change that could be described as a shift in mindset. They dressed distinctly and incorporated many other regular bodily practices into the ritual. By attributing their behavior to possession by the gods, the mediums experienced self-distancing that allowed them to act in ways that veered from their core sense of identity. And they didn’t do it alone. Critically, the community believed in the power of the ritual and supported those who went through it. “There was a mutually reinforcing relationship between the conceptual meanings, like the new narratives the mediums took on, the bodily practices of feeling different, and the shared meanings that were socially reinforced.”

Jason Okonofua is an assistant professor of psychology at the University of California, Berkeley. He studies the socio-cultural effects of societal inequality in criminal justice, business, and education and designs scalable interventions. Okonofua focused on his nationally acclaimed work in education, which examines how teacher bias – conscious or subconscious – affects student behavior and performance. “By shifting the teacher’s mindset to be more humanizing of students from various backgrounds, that can lead them to treat students in a different way. In turn, that can lead students to have a mindset that they can be respected in that context, and then to want to behave and perform better in that context.” Over time, these empathy-based interventions showed a 50% reduction in school suspensions. That research is now being replicated in larger and more geographically diverse districts across the U.S., with the intention of creating huge data sets and a computer-based system that can match interventions to different contexts. Designing interventions for teachers that tap into their empathy is one thing, he noted, but prison guards are another matter. “There’s not

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any magic bullet for these things so we need to be flexible based on context."

INFLUENCE OF COMMUNITY

Lourdes Rodriguez is associate professor and director of the Center for Place-Based Initiatives at Dell Medical School at the University of Texas, Austin. She became interested in the role of place while helping people heal from 9-11 in New York City. Next, she developed CLIMB – a CDC-funded, multi-year intervention aimed at preventing youth violence by mobilizing communities to reconnect with and reclaim community parks.

can bring together a diverse array of local people and resources to solve local population health problems.

Anissa Vines, assistant professor of research in epidemiology at the University of North Carolina at Chapel Hill's School of Global Public Health, studies racial and ethnic health disparities that arise from inequities. Discovering unexpectedly high miscarriage and post-natal complication rates among college-educated African-American women led her to analyze the relationship between racism, discrimination, and stress – and their effects on health. Using both qualitative and quantitative methods, her research on the lives of black women

has yielded multiple insights: stress among mothers was strongly triggered by concerns about raising children in a race-conscious world; passive emotional responses to discrimination were widespread, but feeling "determined" could have protective effects; white women and black women experience critical life events (e.g., having children) very differently, which shapes their stress responses; and black



That's when Rodriguez discovered the power of the potluck. "In the context of very limited resources, how do you create community mobilization for health wins? When we use the community potluck to organize, we value everybody's contribution equally, whether you are a stay-at-home mom, a middle-class white woman or a retired African-American senior. We create opportunities for them to realize that the things that they do together cannot happen if they don't do it together." Since 80 percent of our health is determined by interventions outside of clinical settings, Rodriguez said, the potluck approach

women experience different contextual stressors (e.g., instability in housing) than their white counterparts.

What's become especially important to Vines as both an epidemiologist and an educator is that "you really have to understand the population you're studying – the history, the context, the culture." Vines emphasized that community involvement in public health research is essential, and that interventions need engage and motivate the community.

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Larry Wallack, a professor at the Oregon Health and Science University/Portland State University School of Public Health, brings 40 years of experience as a researcher and leader in public health communications. A key piece of his work involves framing individual behavioral issues as social, economic, and political issues. In doing so, he's tackled a wide range of issues including guns and violence, affirmative action, housing, alcohol, cancer, and currently, epigenetics. "Individualism," he said, "may be the first language of America, but community is the first language of public health." When faced with a problem, we immediately ask "What can I do?" instead of "What can we collectively do and what is my contribution?" This plays out in various

ways: scaling understanding and interventions from the individual to the population level; framing public health as social justice vs. market justice (e.g., who is responsible?); and recognizing that "no one is a blank slate" when it comes to how we frame, interpret, and communicate about issues and possibilities.



FROM LEFT TO RIGHT: ALANA CONNER, YI-YUAN TANG, ALIA CRUM, LARRY WALLACK, HEATHER BERLIN



MAKING CONNECTIONS

Throughout the conference and during the final morning, the participants engaged in wide-ranging conversations to push and connect their ideas and insights. Amid the four themes that emerged, one idea persisted: understanding and unleashing the Power of Minds can't be accomplished alone.

So long, silos: One of the hardest parts of trying to understand how to leverage the power of minds is the multi-level nature of the question. How will researchers connect activity in the brain to the mindsets that change the body and behaviors to the places and cultures that shape the mindsets? How will those research areas break out of their silos?

The conceptual tool of complex adaptive systems, presented by philosopher Nancey Murphy, proved particularly helpful in framing the bigger task. That could also shed light on the idea of a mindset being a "higher-order configuration of brain circuits," noted Bill Newsome, director of the Stanford Neurosciences Institute.

Even with a way to grasp the enormity of the challenges, how will researchers actually collaborate, not just with each other but with the real world outside academia that they're trying to inform and improve? The conference provided many ideas for breaking out of the systems of solitude that could constrain progress.

Common language: Different disciplines have different definitions for the same terms. How can neuroscientists, psychologists, epidemiologists, medical doctors, anthropologists, and others find a common meaning for words such as self, compassion, mindset, or even mind? Many other terms may also prove useful when trying to collaborate on connecting body to mind to culture. Those mentioned at the conference include: wise interventions, reintegrative shaming, structural stigma, community-based participatory research, multiple realizability, mutual manipulability, therapeutic alliance, and others. More broadly, what stories and words about power of minds research will reflect its multi-level ties from the brain all the way up to social structures?

When we're talking broadly about the power of minds and how minds influence bodies, and cultures influence minds, which influence bodies, which influence cultures — that's a different thing altogether. I wouldn't just call that mindset; it is just one piece of an interwoven system. Coming up with names that describe the interconnectedness of minds and mindsets, and the cycles that go on there, is what we need.

— ALIA CRUM, STANFORD UNIVERSITY

We shouldn't be reductionistic by just thinking about the level of the individual. We should also give agency to individuals within the context. What terms, concepts, images, or metaphors might help?

— MARK HATZENBUEHLER, COLUMBIA UNIVERSITY

From a public health perspective, the term 'mindset' doesn't work, and it may be counter-productive. It tends to focus disproportionate responsibility on the individual. The failure of someone to overcome something won't be viewed as connected to a social context. That individual will instead be blamed for the poor mindset he or she has.

— LARRY WALLACK, OREGON HEALTH AND SCIENCE UNIVERSITY/PORTLAND STATE UNIVERSITY SCHOOL OF PUBLIC HEALTH

CBCT (Cognitively Based Compassion Training) includes a component focused on self-compassion and achieving equanimity, so as to provide consistent care from patient to patient. We need to have a common frame of reference for forgiveness among healthcare providers. That way, patients can have a sense that no matter who's in the [chaplain's] blue coat and regardless of the religious background, they get the same treatment.

— GEORGE H. GRANT, EMORY UNIVERSITY

This way to the bridges: Some phenomena seemed to show interesting results at one, two, or all of the body-mind-culture levels that could make them

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good candidates for collaborative research. These included inflammation, stress, sleep, expectations, attention, attributions, purpose, concepts of the self, compassion, forgiveness, empathy, shame, and anger, among others.

Neuroscience can establish the bridging mechanisms between different levels of research. It can explore phenomena like a direct brain-immune interaction. It can understand the mechanisms behind interventions, to make them more precise and useful in different contexts.

– BILL NEWSOME, STANFORD UNIVERSITY

There's increasing evidence in my opinion, to suggest that, in really powerful ways, what we are as sentient beings is truly dispersed. Certainly it's dispersed beyond the brain.

– CHUCK RAISON, UNIVERSITY OF WISCONSIN, MADISON AND EMORY UNIVERSITY

Mind and body can only be considered in context, and context includes many different aspects and levels. Each of us are nodes in an intersecting culture cycle. We're all complex. We're all multicultural.

– HAZEL MARKUS, STANFORD UNIVERSITY

Data design: Researchers from different fields collect different kinds of data and organize them in specific ways. How can they create structures that facilitate sharing their findings across disciplines? Could researchers add new data-collection steps to their work so as to make it accessible to others? For example, could a social psychologists add in biomarkers and ZIP codes? How can practitioners and communities inform the collection and interpretation of data? And is trying to prove something beyond the shadow of a doubt with "perfect data" always the best research approach when pressing real world problems need to be fixed now?

In an ideal world, we would have this integrated data set that goes all the way from cells to society. Maybe that's too hard. Maybe we do multi-set tests of mindset interventions?

– MATT TRUJILLO, ROBERT WOOD JOHNSON FOUNDATION

Anthropologists can work with neuroscientists, psychologists, and others by providing field-based data to complement and critique data that's coming from the clinic and from the laboratory.

– DANIEL LENDE, UNIVERSITY OF SOUTH FLORIDA

In the interest of doing our work and proving things beyond a shadow of a doubt, we're going to lose the sense of urgency. I want us to be okay with data being good enough, not perfect.

– LOURDES RODRIGUEZ, UNIVERSITY OF TEXAS, AUSTIN

Part of what I'd like to see next is independent data collection, where you get measures of social relationship, social integration, and social support, and see how that differs across contexts, and how the context affects those interpersonal processes. None of these data have specific measures of these particular stigmatized groups to answer that.

– MARK HATZENBUEHLER, COLUMBIA UNIVERSITY

Connecting with communities: Researchers tend to view practitioners and communities as subjects rather than collaborators on scientific inquiries. How can studies be improved by working more closely with people living the problems?

In epidemiology, we're thinking about the determinants that are shaping the health of the population. What is predicting those unusual patterns? It's not just an exposure. It is positioning that exposure within its social, political, and historical contexts. It is critical to engage the community to understand what our research questions really mean. We need

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to help them understand researchers' role and the data. If community members can understand the data, they can help us interpret it.

— ANISSA VINES, UNIVERSITY OF NORTH CAROLINA, CHAPEL HILL

A lot of times, we'll come up with great ideas in the lab that won't work in the field. You can spend your life in the lab trying to solve problems that no one actually has. Practitioners also understand how to motivate people to use interventions. They can point to the metaphors and narratives that sell the ideas.

— ALANA CONNER, STANFORD UNIVERSITY

People in communities have an innate understanding of the structural nature of the problems they face. They don't see them separated into distinct topics — psychology, economics, sociology — like we do in academia. At the Berkeley Media Studies Group, our goal was to not solve problems or tell people the solutions, but to provide people with research-based skills to frame their solutions and their understanding of the problems. It worked in a lot of communities over time.

— LARRY WALLACK, OHSU-PSU

From one to many: Many of the interventions and treatments discussed at the conference focused on helping individuals. How does that scale to the level of public health? How do interventions account for the variety of histories, mindsets, relationships, and health concerns of thousands or millions of people? Are there interventions at the community level that would produce wellbeing improvements at the individual level? Which public policies benefit or harm people's well-being the most? How can scientists structure their research to find out?

Everybody in this room is significantly changing individual lives. The issue is linking that to bigger social change. How do we make a difference in the short term, but link it to a collective social movement? We could be successful as professionals, but still not achieve our goals to create a better society.

— LARRY WALLACK, OHSU-PSU

It's often difficult to tease apart whether it's the policy versus the attitude. There are data showing that both laws and policies not only shape attitudes, but attitudes of course shape policies. Disentangling those two is difficult. This work needs to develop more comprehensive indicators of structural stigma across multiple different components.

— MARK HATZENBUEHLER, COLUMBIA UNIVERSITY

Do you change the individual, or do you change the policy? The answer is, well, both. Ultimately individuals are changing policies, so we need to work at both levels. And what is the mindset, conscious or subconscious, that these policies activate? We have to think about the core mindset or cognitive or psychological state that a policy activates. That then leads to the changes that we see in behavior, mental health, stress engagement, and other aspects.

— ALIA CRUM, STANFORD UNIVERSITY

What type of considerations do we need to make if we want to apply an intervention not just in one individual, not just in one setting, but across multiple settings, across multiple states, across multiple instances of whatever domain may be involved? I'm looking at using computer science to make an automated system that provides different versions of an intervention that are particularly beneficial for a certain context. The combination of thinking about the context and thinking about the individual's mindset when we're scaling things up does bring about the largest and most lasting effects.

— JASON OKONOFUA, UNIVERSITY OF CALIFORNIA, BERKELEY

The question and the challenge for all of us to discover is for whom rapidly scalable, low-burden, low-cost, even free interventions are effective?

— BETH DARNALL, STANFORD UNIVERSITY

Confronting the Culture of Science: Making change in the world sometimes starts with changing our own assumptions. What cultural norms of the academic community might interfere with the collaborative nature of understanding the power of minds? The Allen Institute, MacArthur Foundation

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Research Network on Successful Aging, and the Midlife Development in the U.S. study may provide clues on how diverse disciplines can work together on complex, long-term problems.

Reductionism and holism: Researchers like to understand the world by reducing systems to their smallest parts, but they often fail to assemble those pieces back into a whole system that builds on the interconnections and describes the big picture.

How do scientists study complex patterns and interventions in rigorous and replicable ways that don't destroy the phenomena they seek to understand?

— CHUCK RAISON, UW-MADISON AND EMORY UNIVERSITY

As a tribe, I think neuroscientists are very good at taking things apart. But frequently we're not so good at putting them back together, and that influences the way we talk about the brain and the way we talk about humans in public.

— BILL NEWSOME, STANFORD UNIVERSITY

When I studied philosophy of science at Berkeley, there were increasing doubts about scientific reductionism. But no alternatives were presented. Only when I studied theology, and became involved in discussions of positive relations between theology and science, did I begin to find resources.

— NANCEY MURPHY, FULLER THEOLOGICAL SEMINARY

Less me, more we: Western cultures and the academic institutions within them emphasize individual achievement (and failures) and dispense awards (and punishments) according to those values. Those values also color the selection and interpretation of data. How can researchers identify their cultural biases and overcome them?

How can we understand and possibly mitigate the hyper-individualism that permeates our culture and interferes with the benefits of strong communal ties and collaboration? In academia, for example, could we have more interdisciplinary departments and

stop rewarding people only for being a paper's first author? Can we change the incentives?

— HEATHER BERLIN, ICAHN SCHOOL OF MEDICINE, MOUNT SINAI

This is like a gravitational pull in our society — the individual-level explanation for understanding and assigning blame for a broad range of social and public health problems.

— LARRY WALLACK, OHSU-PSU

How do we design interventions for people who are vastly different from us? How do we actually have empathy, sympathy, compassion for, and insight into, most of the world's population, given that they are not WEIRD (Western, Educated, Industrialized, Rich, and Democratic) like us?

— ALANA CONNER, STANFORD UNIVERSITY

Replicability and rigor: Given the media spotlight that falls on mindsets and their potentially significant societal impact, do researchers have an even more pronounced responsibility to ensure the data adhere to the highest standards?

When we do certain types of clinical trials and pre-specify the outcomes before we know what the data look like, to me that is one of the more rigorous tests of whether our hypothesis are really confirmed or not. And that in turn enhances reproducibility.

— RICK HECHT, UCSF

Would the field of physics and its move toward a model of blind analysis of data serve as a guide for research on the power of minds?

— JOHN CAMPBELL, UC BERKELEY

We should be sharing data a lot and giving ideas about dispersal of the data with simple things like error bars and statistical tests.

— BILL NEWSOME, STANFORD UNIVERSITY

CONFERENCE REPORT

Paralyzing perfection: The world needs help now, but scientific research can drag on for years in search of perfection.

If we apply the same standards that we apply to evidence-based interventions to technology, we would still have rotary phones. And when we think about the development of evidence-based interventions, we tend to want to freeze things in time and say they'll never change, because that's heresy in science, right? I would like for us to think about our work as an iterative process as opposed to one where we build the evidence and then freeze it in time.

— LOURDES RODRIGUEZ, UNIVERSITY OF TEXAS, AUSTIN

I work with a group of epidemiologists on developmental origins. When they talk about their research agenda individually, it all sounds good, but if you put together the timeline, it would be 85 years before they felt comfortable going to the state legislature to say something about housing.

— LARRY WALLACK, OHSU-PSU

If you do a potluck right now in New York City and everybody's helped, well, who cares if 10 years later in Atlanta it doesn't work? That's not really to the point. You want to go on and do the thing now. On the other hand, if what you're interested in is establishing causality, then 15 years seems to be a perfectly reasonable time scale. How do we recognize those two ways of looking at interventions and incorporate them into our research and real-world applications?

— JOHN CAMPBELL, UNIVERSITY OF CALIFORNIA, BERKELEY

People want to know, 'What can I do now to make my life better?' We have a choice. We can either weigh in on that with the best of what we know, with the appropriate caveats, or we can say, 'No, we're going to wait until the data get really, really, really, really good.' But just because we wait does not mean the world waits for us. People will try to solve their problems however they can, and we won't be there to help them. It's important to go for rigor in

what we understand and share with each other, but it's also important to acknowledge that knowledge is iterative.

— BRIE LINKENHOKER, STANFORD UNIVERSITY

Get out of the ivory tower: Doing great research is necessary, but not sufficient. How might scientists break out of the bubble of academia, help make progress on real-world problems, and connect with broader audiences?

Academics are really good at developing knowledge, less so at getting it into the real world. But we need to do it. It could also help create the jobs and institutional transformations that would support more of the people we train at a time when academia is vulnerable.

— DANIEL LENDE, UNIVERSITY OF SOUTH FLORIDA

Much of the research published in prestigious journals ends with a couple of sentences to the effect of, 'These findings should inform future interventions and public policy.' However, there is rarely specific instructions on how, why, or what to expect when you try to integrate science with the real world.

— JASON OKONOFUA, UNIVERSITY OF CALIFORNIA, BERKELEY

Journals aren't the only repository of valuable information. What about the insightful, interdisciplinary conversations we have with university colleagues? Can we share those with a broader audience?

— BRIE LINKENHOKER, STANFORD UNIVERSITY

Locating the levers: Can spiritual possession heal? In Brazil, it can, according to the aforementioned research from Rebecca Seligman of Northwestern University. Could the medium's experiences point toward questions that would reveal the psychological, bodily, cultural, and communal levers that activate the power of minds?

Maybe. Maybe not. Regardless, there are many other conceptual pulleys to consider that emerged from the conference.

Self, other, and the bonds between: If Socrates had attended the Power of Minds conference, he might have wanted to change a famous quote often attributed to him to, "To know thyself – and your relationship to others – is the beginning of wisdom."

Can people's understanding of the self and its relationship to broader communities – or even higher spiritual powers – be altered and used to facilitate positive social change? How would it be altered? What's going on in the brain when it comes to the self and its relationship with others?

What if the 'self' disappeared in some way, so we don't have any label? What would happen, behaviorally and psychologically, at the brain level? If we change our conception of 'self,' how would our understanding of others also change?

– YI-YUAN TANG, TEXAS TECH UNIVERSITY

Why do we want to be beyond this time, and beyond this place, and even beyond this body or beyond this consciousness?

– ALANA CONNER, STANFORD UNIVERSITY

What's the best kind of therapy? Is it CBCT (Cognitively Based Compassion Training), is it ACT (Acceptance and Commitment Therapy), is it psychoanalysis? Comparative studies show that regardless of the treatment type, there's this thing called therapeutic alliance. That's where the main effect is. I conceptualize that as connection. That's what George Grant has been describing in terms of empathizing with patients. When we talk about healing loneliness, it's not just a feeling that you have this one supportive person, but also that you create a connection to an imaginary, supportive figure, whether it's God or another entity. That's another form of connection, which I think reduces stress and can have all those positive physiological effects.

– HEATHER BERLIN, ICAHN SCHOOL OF MEDICINE, MOUNT SINAI

If you tune the body and the brain at same time... you find your mind, for the first time, can have distance from your own thinking, your emotions, your feelings. Most of time we think of our mind, our thinking, our emotions, as our 'self.' This why depression patients always think they cannot do anything.

– YI-YUAN TANG, TEXAS TECH UNIVERSITY

People who go through CBCT (Cognitively Based Compassion Training) and Japanese Naikan practice experience an increased sense of connectedness with others. They realize through the web of interdependence how much they have been accepted and loved by more people than they expected. That seems to lead to a better sense of self-worth and an improved capacity for forgiveness.

– CHIKAKO OZAWA-DE SILVA, EMORY UNIVERSITY

What new tools can help us ask questions about a person in context? How can we shift somebody's identity or take on different pieces of the self in context while trying to still look at mechanisms within an individual? And what are the optimal points in time for interventions, in terms of developmental trajectories and shifting identities?

– LAUREN ATLAS, NATIONAL CENTER FOR COMPLEMENTARY AND INTEGRATIVE HEALTH

I can give any of us a way to think about the self, and it can have some power, but it's going to have its greatest power if it is well-represented in people's cultural context.

– HAZEL MARKUS, STANFORD UNIVERSITY

When we ask about 'why' when it comes to problems we encounter, implicitly it is, 'Why me?' That's the self-oriented perspective. But if you move towards other-oriented perspectives, you become more resilient to your personal suffering.

– CHIKAKO OZAWA-DE SILVA, EMORY UNIVERSITY

Sharing cultures to create community and strengthen bonds seems to provide many benefits. What do we need to provide people so they share their cultures more often and more easily? Is it a sense of psychological safety in the community? What is the right mindset? Do they need sense of self that's rooted in their own culture before being exposed to other cultures?

— KARI LEIBOWITZ, STANFORD UNIVERSITY

The sense of being needed, being in a really good relationship itself, actually fulfills a sense of being, some sense of direction or purpose in life. And I think that can be a fascinating component that we tend not to pay much attention to. When we start asking people what they mean, what's their meaning or goal in life, oftentimes we seem to be thinking in a relational context.

— CHIKAKO OZAWA-DE SILVA, EMORY UNIVERSITY

Emotional instruments: As Erick Ramirez from Santa Clara University told us, shame gets a bad rap. It is an under-utilized "source of moral character improvement" that can help people, especially juveniles, change for the better and rejoin their communities as part of a reintegrative shaming process.

What other emotions, negative or otherwise, might help change the trajectory of people's health? How do they register in the brain? How do interventions target them and why? And how does culture tame, frame, and game the feelings that people have?

Our visual experience of the world does represent how we feel about it. Subjective judgments, such as our feelings about whether we look good in a dress, are embedded in the sensory cortex. It's like the lens through which you're looking at the world has information about your feelings right next to these other so-called objective features of reality, such as the color of the dress. It highlights the power of the mind to warp even the things that should be most objectively represented in our brains.

— ADAM K. ANDERSON, CORNELL UNIVERSITY

Emotion and reason need to go hand in hand, because emotions give information about the state of the world. Those prepare us to take certain types of actions. We don't necessarily want to eliminate emotion, but we also don't want to get overwhelmed by emotions so that we can't actually see what is going on beyond them. I think the issue is titrating emotions.

— OZ AYDUK, UNIVERSITY OF CALIFORNIA, BERKELEY

The Robert Wood Johnson Foundation wants to create a culture of health. Do we make emotional appeals? Do we make rational appeals? Emotion, reason — do they get along? Which one should we focus on?

— MATT TRUJILLO, ROBERT WOOD JOHNSON FOUNDATION

In cases where it is better for us mentally and physically to change our emotions, what are some of the techniques, the way we think about the world, or think about our experience that can actually foster adaptive emotional regulation?

— OZ AYDUK, UNIVERSITY OF CALIFORNIA, BERKELEY

Forgiveness is a very difficult thing. To this day, there is no consensus on what it means. Often people talk about forgiveness in terms of forgetting someone, which isn't genuine forgiveness. Naikan practitioners and seemingly neuroscience show that people are good at remembering harm done to them, but not kindnesses. The Naikan 'kindness mindfulness' practice boosts people's sense of gratitude, interdependence, and appreciation for support from others. That leads to self-acceptance, and that then makes it easier for people to forgive others and potentially generate positive impacts on health.

— CHIKAKO OZAWA-DE SILVA, EMORY UNIVERSITY

In moderation, all emotions are adaptive. If we can take that perspective and use them – ask why, what are they telling us – instead of trying to accentuate the positive all the time, I think that could be a useful framing.

– ADAM K. ANDERSON, CORNELL UNIVERSITY

Gods and rituals: Spirituality, religion, ritualistic practices associated with higher-power belief systems, and mystical experiences have helped people transform their relationship with trauma and improve their health. How can we understand the power of these phenomena and leverage it for good?

This is Kenneth Pargament's definition: Spirituality is search for the sacred. Religiousness is search for significance in the context of established institutions designed to facilitate spirituality.

– AMY KRENTZMAN, UNIVERSITY OF MINNESOTA

If a person has utilized religion in a negative way – non-reintegrative shame, for example – then that might be debilitating. If it can be used positively to make people feel more connected and comforted by an outside spiritual force, then healthcare providers should respect that. And that respect makes the patient feel supported in what can be a stressful environment.

– GEORGE H. GRANT, EMORY UNIVERSITY

Psychedelics produce a complex pattern of connections between parts of the brain. Things go everywhere, and parts of the brain don't usually get to talk to each other stand up and have their day in court. And that seems to have powerful effects. A huge percentage of people have profound antidepressant responses that are apparent within a day, and are fully in place six months later. The amount of improvement in depression, anxiety, or even

smoking, is powerfully correlated with the amount of powerful peak, or mystical, or non-dual experience, that people have during treatment. It's an example of how inducing that state, in ways we don't understand yet, seems to have this real benefit in the modern world.

– CHUCK RAISON, UW-MADISON AND EMORY UNIVERSITY

Path to the peak: Throughout the conference, conversations repeatedly turned toward identifying best practices and the most pressing problems. What does it mean to be healthy? What can we learn by flipping around diagnostic guidelines for illnesses, such as Corey Keyes of Emory University did with depression to understand flourishing? How are interventions most effective and socially just? What issues pose the greatest threats? And how should people working for change communicate about it?

Focus on flourishing: Health is more than the absence of illness. To be healthy is to flourish, not just survive. But scientists and care providers tend to focus on people's nadirs over their acmes. That has serious implications.

The things that we choose to study are the things that sometimes are easier to articulate in a scientific setting, but there's a lot of things that don't get studied that are important. And we don't always take a moment to look at it from the flip side.

– LOURDES RODRIGUEZ, UNIVERSITY OF TEXAS

We know what active addiction looks like; we have a picture of that visually. But we don't know what recovery looks like because people become invisible when they come into recovery.

– AMY KRENTZMAN, UNIVERSITY OF MINNESOTA

CONFERENCE REPORT

Inspiration is hard to study. It's not the thing that you're most likely to get a grant to pursue. But it's just as important as shame, depression, and other negative phenomena that inform health.

– BRIE LINKENHOKER, STANFORD UNIVERSITY

Fault lines: How do people studying and working for change avoid the trap of victim blaming? Which problems are institutional or communal, and which are personal? Who is making those distinctions? Why?

Talking about emotions, I have a little bit of fear that we go into a mindset thinking that we're giving oppressors a pass. We should be cautious about asking suffering people to change, rather than asking those who are creating conditions that lead to illness, mental stress, and other problems.

– LOURDES RODRIGUEZ, UNIVERSITY OF TEXAS, AUSTIN

I think stigmatized groups get the message that they're defective, morally or biologically, and the question is whether you believe the problem really is inside of you, or whether the problem lies with society.

– COREY KEYES, EMORY UNIVERSITY

How can educational institutions and other powerful organizations be more welcoming to interdependent mindsets, so to make valuable life experiences more accessible to more people?

– HAZEL MARKUS, STANFORD UNIVERSITY

How does a cultural mindset about the purpose of life affect children in an educational context and potentially cause greater rates of depression and anxiety?

– COREY KEYES, EMORY UNIVERSITY

There are so many factors in the healthcare system that maintain maladaptive perceptions and mindsets. Who and what are the maintainers of specific mindsets in our culture? How do we intervene with healthcare professionals to transform their culture of

care? How do we get them to talk about pain in a way that empowers patients rather than discourages them? We need a common language so that we're continually reinforcing the healthful pathway.

– BETH DARNALL, STANFORD UNIVERSITY

Threats and responses: On the long list of the world's problems, which should researchers, practitioners, and communities prioritize? Critical targets that conference attendees mentioned include chronic stress, obesity, pain, opioid addiction, inflammation, structural stigma, childhood trauma, depression, and anxiety. And as Anthony Burrow from Cornell University noted, the world's increasing diversity – something that many people value – creates notable social pressures. How should researchers take on these challenges given the inherent complexity of these issues?

The stress of growing up in these high structural stigma environments may be exerting biological consequences similar to other chronic life stressors.

– MARK HATZENBUEHLER, COLUMBIA UNIVERSITY

What social, political and economic forces have interests other than social harmony? Can we identify and contain them?

–ERIK RAMIREZ, SANTA CLARA UNIVERSITY

If you believe that stress is debilitating, what's your motivation? The motivation is to avoid or counteract the stress response. Your attention then becomes either avoidant: you don't want to deal with it or are overly vigilant. Your affect is either predominantly negative or it's blunted, and your physiology responds by being hyperactive or hypoactive. If you think about this, it makes logical sense: If you change the mindset from viewing stress as something that's debilitating, to viewing it as something that's enhancing, the whole game changes. So now what's the motivation? It's not to avoid stress, it's to utilize stress to achieve the underlying goal.

– ALIA CRUM, STANFORD UNIVERSITY

CONFERENCE REPORT

When treating depression, antidepressants and cognitive behavioral therapy together are better than either alone. That says humans really are bottom-up creatures — those receptors and those transmitter systems really do matter for our behavior and our high-level cognition and our healthy interaction with the world. But it also says that we are top-down creatures, and it says that beliefs matter.

— CHUCK RAISON, UW-MADISON AND EMORY UNIVERSITY

When we heard the discussion about self-distancing versus distraction to manage emotions, I immediately thought of what's going on in everyday life now with social media, where we don't do a lot of self-distancing. It's all distraction. Capitalism works to do that a lot. And then, boom, there's an explosion of emotion, which often gets manipulated.

— DANIEL LENDE, UNIVERSITY OF SOUTH FLORIDA

The frame game: How researchers communicate about social problems and their potential solutions can deeply influence their collaboration with each other, relationships with the people they're trying to help, and the likelihood of success.

People do not bring blank slates to their understanding of science or potential responses to interventions. They interpret everything through their own point of view. How do we communicate about science so people understand it?

— LARRY WALLACK, OHSU-PSU

How do we tell the stories of communities in a way that empowers them with individuality while motivating change, without ignoring the importance of interdependence?

— ALANA CONNER, STANFORD UNIVERSITY

How can we adapt interventions to specific cultures and religions because of the importance of different understandings of critical words, such as forgiveness?

— DAWID POTGIETER, TEMPLETON WORLD CHARITY FOUNDATION

How do we actually reframe how we think about social difference, and if we communicate that message to students, can that actually help them succeed?

— MARYAM HAMEDANI, STANFORD UNIVERSITY

We do want the rigorous science, but it has to be balanced with the public engagement. It doesn't have to be an either/or. How do academics do a better job of getting their work out there? I started doing a lot online when I realized my students went there first. If anthropology wasn't there, they didn't get anthropology.

— DANIEL LENDE, UNIVERSITY OF SOUTH FLORIDA

One of the basic problems we have in science communication is communicating uncertainty, because science is about probabilistic events and uncertainty. There are a lot of things that we can do better, but you're still left with the uncertainty. That's something that is going to be a constant disadvantage.

— LARRY WALLACK, OHSU-PSU

While researchers chase after perfect data before talking about their work, crackpots are making engaging content that influences people on social media.

— BRIE LINKENHOKER, STANFORD UNIVERSITY

The art of change: Improving human health, well-being, and achievement requires a scalpel, not a cleaver, or at least the awareness of which tool is best for a particular issue. What nuances should researchers keep in mind when designing or applying studies, treatments, and interventions?

One of the prerequisites for change is being willing to alter what you already know and be vulnerable to something new. What are the causes and conditions of vulnerability? How do we allow ourselves to challenge our self-concept and what we think we know and how we do things? And how can we be vulnerable with other people and allow them to challenge who we are, what we think we know?

— MELISSA ROSENKRANZ, UNIVERSITY OF WISCONSIN-MADISON

Telling people to change can backfire because we're a complex system. When we tell people, 'This is the way for you to change,' we're actually asking them to change their self-concept. They start to feel less authentic, for example, and we know authenticity has a lot of implications for wellbeing.

— OZ AYDUK, UNIVERSITY OF CALIFORNIA, BERKELEY

For me, what creates change is realigning the things that are good for us with the things that are fun for us.

— ALIA CRUM, STANFORD UNIVERSITY

If your world's falling apart, maybe your sense of meaning and direction could put them back together, particularly as it pertains to contributing to a society around you. That purpose — this grandiose idea that has ancient traditions — may have real purchase in terms of the everyday context that we have to navigate.

— ANTHONY BURROW, CORNELL UNIVERSITY

When you think about interventions, the more you try to do it, it almost can be anxiety provoking. What's your purpose? What's your meaning? For a lot of people who have it, it's an unconscious drive.

It's an innate thing. Where did it come from, we don't know. How we can consciously help people get to these places, when a lot of it is happening unconsciously?

— HEATHER BERLIN, ICAHN SCHOOL OF MEDICINE, MOUNT SINAI

Inspiration could be considered a more positive way to encourage people to change. It is a combination of bottom-up emotions coming together with top-down reason. It sets off a mindset that anything's possible. It is another way in which you can get people to address their character, but from a different perspective: I'm already good, but I could be better. Are there any neuroscientists studying inspiration? What is it? What triggers it? What emotions go into it?

— COREY KEYES, EMORY UNIVERSITY

The underlying biological differences between people are important to consider when asking them to change. Some people can more easily meditate or to be mindful than others. People can change, but there are limitations.

— HEATHER BERLIN, ICAHN SCHOOL OF MEDICINE, MOUNT SINAI

If we look at crisis as this opportunity for population intervention, then it gets a little bit dicey because everybody in that community is at various stages. If we think we know what ought to happen, that's a trap.

— DAVID BECKER, UCSF Osher Center for Integrative Medicine

To me, crisis is the beginning of social movements. It's not about infringing on the community. It's about enriching and providing power to the community. Is social crisis an opportunity for taking mindset to scale and shaping new mindsets to do something about these problems? How do we frame research and interventions from a social justice perspective? How can we tap into communities' entrepreneurial spirit and businesses to tackle social problems?

— LARRY WALLACK, OHSU-PSU

CONFERENCE REPORT

A lot of the conversations we have about behavior change focus on a target: how do we make this person change his or her behavior? It's important to also explore how we act on the people around the individuals whom we want to change.

— ALANA CONNER, STANFORD UNIVERSITY

When we think about interventions, we should think about all the mindsets of the people who are involved, from those who are suffering to those causing the suffering, and how those mindsets interact.

— JASON OKONOFUA, UNIVERSITY OF CALIFORNIA, BERKELEY

How do you help people identify and feel motivated to enact the changes they want without coming in as a self-proclaimed expert and telling them what to do, which can be off-putting?

— RICK HECHT, UCSF OSHER CENTER FOR INTEGRATIVE MEDICINE

For interventions connected to flourishing, purpose, and creativity, are you helping people tap into something that was already in them, or is it something that is being introduced to them? Is it important for them to have certain experiences before getting this intervention? Do you want this intervention to inform what they've already been through?

— JASON OKONOFUA, UNIVERSITY OF CALIFORNIA, BERKELEY

Initially, changing behavior is hard. So is maintaining those changes, though it gets easier over time. How do we not only begin interventions that make society better, but keep them going?

— AMY KRENTZMAN, UNIVERSITY OF MINNESOTA





REFLECTIONS

How do you close a conference so rich in complexity and inquiry across disciplines and domains? That was the task of the final panelists, who were asked to reflect on what they had heard over the previous few days.

Alia Crum, co-host and psychologist, was thrilled by the interweaving and interconnectedness of all the forces discussed, from the biological to the structural to the personal to the physical, even to the metaphysical. "At the outset, she noted, participants were warned that they'd be frustrated by the breadth and lack of time to go deep. "That's a mindset, right?" said Crum. "That was a nudge that shaped the whole conference. Subtle things in the structure gave way to other mindsets; the fact the everyone was encouraged to speak created a mindset that we're all valued and that each perspective was important." For her the most important mindset that emerged was the sense that "we're onto something here, that there's something inherently right and useful in this interdisciplinary approach."

Crum urged the participants to start changing the system by making research teams, formal and informal advisors, and incentives more interdisciplinary. She ended with another call to action: "Why are we still surprised that our minds influence our bodies? We experience this every day. Why are we still stuck in this dualistic view? It's time to shift our own mindsets about the mind-body connection."

David Becker, a pediatrician who specializes in integrative medicine at the University of California, San Francisco reiterated the value of bringing together diverse talents, backgrounds, and viewpoints – and the challenges ahead. Although those who have latched onto the idea of integrative medicine talk a lot about mind-body practices, he said, "in general medical community, the understanding of those practices is really rudimentary."

"We are at a loss for tools," Becker added. "And we're trying to hold on to our physiological and pathophysiological understanding in the context of everything else that informs it, including nutrition, physical activity, toxic exposures, adverse childhood experiences. What I'm hoping to take out of this are additional ways of framing, thinking about, and then communicating to that medical community. As challenging as it seems, it's doable and it's vital."

John Campbell, professor of philosophy at the University of California, Berkeley, admitted that the level and scope of mind-body-culture interactions he encountered at the conference did come as a surprise. Hearing about how mindsets affect things like blood pressure and body fat "seemed like a kind of magic, and it's there in the title of the conference. How can the power the mind do that?"

Yet, Campbell noted, the evidence that mindset can directly affect physiology came up again and again, drawing on many scientific studies. Probably the hardest worked concept at the conference was stress, which, he said, "functions as a kind of bridge concept, connecting the social/structural to the psychological to the physiological. This is how the magic was done. This was how the bridge was crossed." Perhaps inflammation, sleep, pain, anger and emotions are also complex bridging concepts.

Why are we still surprised that our minds influence our bodies? We experience this every day. Why are we still stuck in this dualistic view? It's time to shift our own mindsets about the mind-body connection.

CONFERENCE REPORT

Stanford neuro-biologist and co-host **Bill Newsome** ended with the same question he posed at the start of the conference: What can neuroscience add to the conversation about the power of minds? "The behavioral data that were presented have validity and applicability even without an understanding of neural mechanisms," he said. "One answer is that neuroscience can establish the bridging mechanisms" and perhaps increase the predictability of outcomes in different contexts. "I feel like I've been exposed to a whole world that I barely knew existed."

A school of fish and a dragon: The final set of reflections reinforced that this could be just the start of a much longer, deeper exploration. The complexity of the conference's conversations highlighted the difficulty—and the potential—of holistically understanding, improving, and maximizing people's health, well-being, and achievement. Questions and answers went from the level of brain mechanisms to the manipulations of mindset to the containers of cultures, swirling as one and many in all directions

like a school of fish trying to navigate the ocean.

Which way should the mission swim next? The answer may remain unclear, but the collaborative nature of the journey seemed apparent after two and a half days of discussion. As Larry Wallack put it (with the help of another piscine metaphor):

A story about carp speaks to our challenges as people trying to change the world. After swimming upstream, the carp comes to a waterfall. It's tired, almost fatally so. Right then it transforms into a dragon that soars over the waterfall. It dawned on me that we're asking the wrong questions. It is not, 'What can I do?' or 'What can my organization do?' Thinking about the carp, the real question is, 'What will it take to get over that waterfall?' The answer is collective, and each of us needs to ask how we can contribute. Getting over the waterfall will take all of us working together. ✨



FROM LEFT TO RIGHT: KATE TURETSKY, ANISSA VINES, MATT TRUJILLO, LOURDES RODRIGUEZ, DAWID POTGIETER



One of the foundational objectives of the Power of Minds project was to perform a high-level survey of scholarly work across disciplines and fields to discover bright spots of ongoing or emerging research, to identify areas ripe for more interdisciplinary investigation, and to begin to identify patterns, outstanding questions, contradictions and emerging themes across research domains. We sought to include topics that are of interest to academic researchers and the broader public, and in doing so, survey both scholarly publications and some of the best popular writing about culture-mind-body interactions.

We aimed to survey 50 books, studies and articles and ended up adding reviews of nine books written primarily for public audiences. Rather than summarizing each publication, we've grouped the scholarly work into "clusters" that inform a cross-disciplinary question or yield insight into where research in a particular field is heading. These of 5-10 papers cannot, by definition, provide comprehensive overviews, especially in areas of intense research activity, like "Pain and Placebo" or "Mindfulness." But in nearly every cluster, we've included excellent reviews comprising more comprehensive references and "state of the field" reports. Some clusters are quite focused; for example, many of the same

authors are listed on multiple papers in the "Wise Interventions" cluster, and the papers share common terminology and theoretical foundations. In other cases, like "Eating: A Mind-Body-Culture Nexus," the choice of papers across vastly different fields is meant to highlight connections that could emerge from more cross-disciplinary research. In choosing research papers, we considered impact on the field, as measured by how and how often papers have been cited, especially within the last few years; rigor, as reflected in study size and methodological approach; appropriateness to the guiding question of the Power of Minds project; unusual clarity in identifying important themes or theoretical underpinnings or offering new ways to frame a problem; and in some cases, controversy, as indicated by public exchanges between scholars and the commentary of science writers in the popular press.

We easily could have included several other clusters in areas like empathy interventions, stress and inflammation as common pathways in mind-body interactions, the role of mindset and mindset interventions in addiction and addiction recovery, or the role of advertising and media campaigns to shape and shift mindsets, but we had to set some limitations on scope. The good news is that research on the connections between mind, body and culture is flourishing, with the promise of much more to come.

CHANGING THE MIND ABOUT THE BODY

Spiegel D (2013). Tranceformations: Hypnosis in brain and body. *Depression and Anxiety* 30(4): 342-52.

Pollan M (2015). The trip treatment. *The New Yorker*, 02/09/2015.

Ross S, Bossis A, Guss J, Agin-Liebes G, Malone T, Cohen B, Mennenga SE, Belser A, Kalliontzi K, Babb J, Su Z, Corby P & Schmidt BL (2016). Rapid and sustained symptom reduction following psilocybin treatment for anxiety and depression in patients with life-threatening cancer: a randomized controlled trial. *Journal of Psychopharmacology*, 30(12): 1165-80.

Griffiths RR, Johnson MW, Carducci MA, Umbricht A, Richards WA, Richards BD, Cosimano MP & Klinedinst MA (2016). Psilocybin produces substantial and sustained decreases in depression and anxiety in patients with life-threatening cancer: A randomized double-blind trial. *Journal of Psychopharmacology* 30(12): 1181-97.

Foell J, Bekrater-Bodmann R, Diers M & Flor H (2013). Mirror therapy for phantom limb pain: Brain changes and the role of body representation. *European Journal of Pain* 18(5): 729-39.

Rosenberg, R.S., Baughman, S.L., Bailenson, J.N. (2013). Virtual superheroes: Using superpowers in virtual reality to encourage prosocial behavior. *PLOS ONE* 8 (1): e55003.

Fox J, Bailenson JN & Tricase L (2013). The embodiment of sexualized virtual selves: The Proteus effect and experiences of self-objectification via avatars. *Computers in Human Behavior* 29, 930-38.

David Spiegel, a psychiatrist at Stanford, has treated hundreds, if not thousands, of patients with cancer over the course of his career. In our interview, he spoke about the mind-body relationships of these patients:

"[One of my patients said] 'I used to think of my body like a dog. Get up, sit down, be quiet, go over there, you know. And all of a sudden it stopped obeying me.' She had to kind of reconstitute her relationship to her body. If you have heart disease or liver disease, an organ is not doing its job. It's letting you down. But with cancer it's different. Patients think, 'I've got a terrorist inside my body. It's trying to kill me.'"

Asked about how his therapeutic approach aims to change that relationship with the body, Spiegel said, "I often like to use the image, if what was happening to your body were happening to your young child, how would you treat it and how would you feel about it? [Patients say] of course, it would be totally different. 'Oh, well I'd nurture, encourage her, and I'd tell her not feel so bad.' And I'd say, 'But look how you're treating your body.'"

Spiegel continued, "I find in using hypnosis with people, that it's a very helpful thing to get them to just picture their body and think about how they feel. Often they'll start to cry. They say, 'I'm so angry at it. I'm so frustrated. It's just not letting me live the way I want to live.'" The goal of hypnosis, he says, is to help a person experience dissociation from his or her body so that it becomes easier to forge a new kind of relationship with the body.

Spiegel explores this and other applications of hypnosis in "Tranceformations," his excellent review on hypnosis published in 2013. He defines hypnosis as a "state of highly focused attention, coupled with dissociation of competing thoughts and sensations

toward the periphery of awareness, and enhanced response to social cues." Among the experimental findings that Spiegel surveys are:

»Hypnotic instruction can reduce the experience of pain, but interestingly, it seems to operate through different neural networks than the placebo effect. The latter seems to be largely mediated through endogenous opiates, whereas blockers of endogenous opiates do not block the pain reducing effects of hypnosis. Brain regions involved in the hypnotic suppression of pain vary according to the instruction the subject receives ("your pain will not bother you" versus "you can reduce pain by focusing on a competing sensation.")

»Hypnosis can have quantifiable benefits. Patients undergoing renal and vascular procedures in a clinical trial were assigned to a group with sympathetic nurse support or a pain-reducing hypnosis intervention. The patients who received hypnosis used half the self-administered pain medication, reported significantly less anxiety and pain, had fewer complications, and had shorter procedure times (17 minutes less on average).

»In another pair of studies, hypnotic instruction could dramatically increase gastric acid production relative to control when subjects were asked to think about eating delicious meals, and decrease gastric acid production when asked specifically not to think about food or drink.

»Hypnosis can be used in combination with other psychotherapeutic approaches for people with

advanced cancer. The data are mixed on whether such therapies can extend life; stronger effects have been reported in cases in which other medical options for treatment are limited.

Spiegel concludes: "Hypnosis is a naturally occurring state of highly focused attention. People vary in their ability to utilize it...The phenomena that constitute hypnosis: absorption, dissociation, and suggestibility, are mobilized spontaneously during trauma, during which they may serve as a unique and adaptive defense against overwhelming fear, pain, and anxiety. Thus, hypnotic phenomena underlie important aspects of the response to stress and trauma. Hypnotic alteration of perception is accompanied by marked changes in the relevant sensory cortices, as well as brain regions involving context monitoring (dorsal anterior cingulate gyrus) and executive function (dorsolateral prefrontal cortex). Hypnosis alters sensation itself, not just response to sensory input, making it a powerful tool in modulating pain as well as anxiety."

Several of these features also figure prominently in descriptions of the effects of the hallucinogen psilocybin in Michael Pollan's engaging article, "The Trip Treatment," which explores a recent minor resurgence in psilocybin experiments, and in a pair of experimental studies on its use in managing anxiety and depression associated with cancer diagnoses. Pollan quotes a psilocybin researcher about how, having taken psilocybin, "individuals transcend their primary identification with their bodies and experience ego-free states . . . and return with a new perspective and profound acceptance." This sentiment echoes Spiegel's ideas about hypnosis working, in some cases, through dissociation and reformation of the mind-body relationship.

Pollan reviews the history of research on psilocybin, which occurs naturally in mushrooms and can also be synthesized, and its synthetic cousin, LSD, detailing how an explosion of interest and poorly executed research in the 1960s with hallucinogens led to near-total suppression of research on hallucinogens in the US until the 2000s. Getting approval to administer hallucinogens in research settings is still daunting in the US, and trials mostly remain

small, but the emerging results are impressive. One 2014 study with 15 smokers used a combination of 2-3 psilocybin treatments with supporting cognitive-behavioral therapy to help participants stop smoking. Six months after treatment, 12 of the 15 were abstinent – a success rate of 80% (versus < 7% in other studies using nicotine replacement therapy, a leading cessation treatment). One subject told Pollan, "Smoking seemed irrelevant, so I stopped."

The pair of *Journal of Psychopharmacology* studies – which were accompanied by a flurry of commentaries from scientists and clinicians in the same journal – together formed one of the largest and most rigorous clinical experiments with psilocybin. A total of 80 patients at New York University and Johns Hopkins University with diagnoses of life-threatening cancer and anxiety or depression received treatment in a double-blind, placebo-controlled study. Fifty-one of the subjects (in the Hopkins study) received a single very-low, placebo-like psilocybin dose, and a single high dose of psilocybin 5 weeks apart, and did not know which they were receiving in each session. In the smaller (NYU) study, subjects received niacin (which creates a tingling sensation) as placebo rather than low-dose psilocybin. The results of the two studies were remarkable: About 80% of the subjects showed significant clinical improvement in their mood disorders after just one (high-dose) treatment with psilocybin – an effect which was sustained more than six months after the hallucinogenic experience.

In these studies and others, the mystical or spiritual quality of the hallucinogenic experience correlates with positive, long-term outcomes. Reading first-hand reports like the ones in Pollan's article reinforces findings that many subjects found the hallucinogenic experience to be among the most meaningful in their lives. Pollan quotes a subject named Tammy Burgess, who, "given a diagnosis of ovarian cancer at fifty-five, found herself gazing across 'the great plain of consciousness. It was very serene and beautiful. I felt alone but I could reach out and touch anyone I'd ever known. When my time came, that's where my life would go once it left me and that was O.K.'"

New research is tracking brain activity during hallucinogenic experiences, and is focused on the so-called “default-mode network,” which Pollan describes as “a critical and centrally situated hub of brain activity that links parts of the cerebral cortex to deeper, older structures in the brain, such as the limbic system and the hippocampus.” The network is most active when we are not attending to a task or otherwise engaged with the outside world, and may be responsible for our ability to maintain a distinct sense of self as separate from others and the environment. Hallucinogens appear to decrease the activity of the default-mode network, which may in turn “free up” other brain regions involved in emotion and memory from its regular inhibitory control. Imaging of brain activity under hallucinogens also suggests that activity between regions of the brain that rarely talk to each other increases.

Given the excitement across the medical and research communities about these recent findings, it is worth keeping an eye on this field. Similarly, reading first-hand accounts of hallucinogenic experiences is also worthwhile in that the language used by participants who have come to hallucinogen use for medical, not spiritual or thrill-seeking purposes, is remarkable, and could yield insight into the deeper theoretical foundations of the capacity of hallucinogens to reset – and possibly rewire – our brains.

Yet another approach to using a remarkable experience to change the relationship between mind and body is virtual reality (VR). We often think about VR as requiring high-tech tools and immersive environments, but recent experiments using nothing more than a mirror demonstrate the plasticity of the brain to adapt to altered feedback about the body. Ramachandran and Rogers-Ramachandran (1996) first developed an approach to use a mirror box to help people with an amputated arm who were experiencing phantom limb pain – a phenomenon experienced by 60-90% of amputees.

Foell et al. (2013) repeated the initial experiment using a mirror to provide the experience of “seeing” a complete arm in place of the amputated limb, accomplished by positioning a reflection of the unaffected arm so that it visually takes the place of the amputated arm. In this and other studies, not all patients benefited from a series of mirror-training

sessions, but those who did benefit experienced significant reductions in pain. Importantly, a prerequisite for pain reduction in mirror training seems to be the feeling of observing one’s own hand rather than a projected mirror image. All the subjects in the 2013 study reported increases in the subjective feeling of seeing one’s own (missing) hand, but they started the study with very different capacities to do so. Foell et. al. recorded brain activity using fMRI during and after mirror training experiences, and found that as phantom limb pain decreased, activity in the primary somatosensory cortical areas representing the hand and arm normalized: brain activity in the area representing the missing limb became more similar to activity in the area representing the unaffected limb. Pain reduction also correlated with reduced activity in the inferior parietal cortex (IPC), an area involved in pain generation and a feeling of agency (“the feeling that leads us to attribute an action to ourselves”) on the side of the brain representing the missing limb. These data show the power of a “virtual” experience to functionally reorganize the brain, and point to at least one of the individual differences that may account for the effectiveness (or lack thereof) of mirror training to reduce pain.

Virtual reality is at the heart of a trio of studies by Jeremy Bailenson, a professor of communication at Stanford, and his colleagues, which provide a window into what is already possible to do with this technology in a rapidly evolving space. Bailenson and his team have built an immersive VR laboratory in a ~20ft x 20ft room at Stanford that integrates sight, sound and touch and allows people to see themselves as avatars in a digitally constructed environment. In many of their experiments, subjects participate in a virtual experience, and then researchers surreptitiously test some aspect of their behavior after the experience, like tracking how many paper towels they use to clean up water “accidentally” spilled by an experimenter, to see whether the experience changed behavior after the fact.

We highlight two of their studies:

»In Rosenberg et al.’s 2013 “virtual superheroes” experiment, 60 subjects were outfitted with VR goggles and body sensors, and then had one

of two experiences: flying, like Superman, over a cityscape through the movements of their own arms, or flying more passively over the same landscape as a passenger in a helicopter. While flying, half of each group was asked to simply tour the city, and the other half were asked to help find a diabetic child in need of insulin. After the experience, the experimenter dropped a cup of pens, and the experimenters videotaped how long it took for the subject to help pick them up, and how many pens the subject picked up. As the researchers expected, subjects who had had the virtual superhero flying experience were quicker to help than those who had had the virtual helicopter experience, and the superhero fliers picked up more pens. (Importantly, the researchers never used the word “superhero” with the subjects). There was no effect of helping find the child versus touring the city, perhaps because that part of the experience was not salient or real enough. The researchers conclude that having had the experience of superhero flight increased prosocial behavior, though they couldn’t conclude what aspect of superhero flight (agency? associations with superhero stories and behavior?) was most likely responsible for the behavioral outcomes.

»In Fox et al. (2012), 86 women aged 18 to 41 from diverse ethnic backgrounds were given one of four experiences seeing themselves as an avatar whose movement precisely mimicked their own. One group of women saw their own face on a sexualized, scantily clad body (sexualized self group), and another saw their own face on a non-sexualized, fully clothed avatar’s body (non-sexualized self group). Two other groups saw an unknown female face about the same age as the subject on either a sexualized non-sexualized avatar (sexualized and non-sexualized other groups, respectively). All of the women moved on their own through a virtual environment, and then interacted with a

male confederate using a script. Participants who saw themselves as sexualized avatars reported significantly more body-related thoughts than those in the non-sexualized groups, and women who saw their own faces on sexualized avatars were more likely to agree with rape acceptance myths like “In the majority of rapes, the victim is promiscuous or has a bad reputation.”

Bailenson’s group has also received attention for a number of other VR experiments, including: creating a virtual experience of poverty in an American city to test whether such an experience can increase empathy for the poor; demonstrating that seeing an aged version of yourself as an avatar can increase the amount subjects commit to save for retirement; and assessing various impacts of seeing oneself as a person of a different race or gender.

Taken together, these studies on hypnosis, hallucinogens, and virtual reality demonstrate the potential to alter the relationship between mind and body to myriad beneficial ends. They are vastly different interventional approaches, but they have several features in common. All involve experiences that help the subject consciously see or experience the body, and sometimes the self, in new ways. Hypnosis and hallucinogenic experience seem to feature or require dissociation from the body before a new relationship can be formed. Subjective experience matters, whether it’s the mystical quality of hallucination, the feeling that a mirrored projection of a missing arm is part of oneself, or feeling the “help” being provided in a virtual experience is actually meaningful. Experiencing one’s self or body in a different way appears to have long-lasting impacts in the context of hallucinogenic experience, but since most VR experiments test only short-term outcomes, it is not yet clear whether VR has the same potential. But VR is likely to expand widely in use over the next several years, making it an important locus of future investigation, perhaps eventually *in combination* with one or more other approaches to re-shaping the relationship between mind and body.

EATING: A MIND-BODY-CULTURE NEXUS

Alcott H, Diamond R & Dubé J-P (2017). The geography of poverty and nutrition: Food deserts and food choices across the United States. NBER Working Paper #24094.

Daubenmier J, Moran PJ, Kristeller J, Acree M, Bacchetti P, Kemeny ME, Dallman M, Lustig RH, Grunfeld C, Nixon DF, Milush JM, Goldman V, Laraia B, Laugero KD, Woodhouse L, Epel ES, & Hecht FM (2016). Effects of a mindfulness-based weight loss intervention in adults with obesity: A randomized clinical trial. *Obesity* 24: 794-804.

Christakis NA & Fowler JH (2007). The spread of obesity in a large social network over 32 years. *The New England Journal of Medicine* 357(4): 370-9.

Harmon K (2011). How obesity spreads in social networks. *Scientific American*, published online 5/5/2011.

Crum AJ, Corbin WR, Brownell KD & Salovey P (2011). Mind over milkshakes: mindsets, not just nutrients, determine ghrelin response. *Health Psychology* 30(4): 424-9.

Fogarty L (2018). When anorexics grow up. *The New York Times*, published online 1/11/2018.

Konstantinovskiy M (2014). Eating disorders do not discriminate. *Slate*, published online 3/20/2014.

The act of eating is driven by biochemical and physical stimuli in our stomachs, blood and brain, and it is deeply influenced by social contexts and cultural expectations. It is therefore a perfect phenomenon through which to investigate the intersection of body, mind and culture.

Eating and its consequences on weight and health are also a near-perfect mirror for broader socioeconomic disparities in society. In recent years, the concept of the food desert – a neighborhood in which residents have little or no access to grocery stores selling fresh produce, meats, dairy and other healthy foods – has become a common feature in explanations of disparities in diets, weight and health between rich and poor people in the United States.

In their recent NBER paper, Alcott et al. investigate whether food deserts are really behind the differences we see between rich and poor diets. Using datasets combining a 60,000 household nationally representative survey of grocery purchases, surveys of nutrition knowledge among members

of surveyed households, a store sales survey that includes 40% of all US grocery purchases, annual data on retail establishments in each zip code, and data on 1,914 new grocery store opening dates and locations, they looked at the impacts of two different events: 1) what happens when new grocery stores with healthy offerings open up in neighborhoods that previously lacked such access, and 2) what happens when residents of food deserts move to neighborhoods with higher quality groceries.

The researchers found that even people living in food deserts bought 90% of their groceries from grocery stores rather than from convenience or drug stores. When new stores open, they shift their buying to the closer store, but the new opening does not have a significant impact on healthy eating choices. When people living in food deserts move to neighborhoods with better grocery options, their diets don't change at all in the short term, and in the medium term, the move only accounts for a 3% improvement in the health of their grocery store purchases.

The concept of a food desert is a powerful one, and intuitively, it seems like it should have greater explanatory power than this study suggests that it does. The researchers note that the association between socioeconomic class and eating choices also isn't fully explained by the price differences between healthy and unhealthy foods, since most of the average price difference is accounted for by produce, and the difference between other healthy vs. unhealthy options is marginal. The authors highlight an analysis that suggests that education accounts for about 20% of the association between income and eating choices. Taken together, these data suggest that attempts to improve food choices might be more successful and effective if they focus more on what people in lower socioeconomic classes know and believe rather than on what grocery store access is locally available, no matter how compelling the concept of the food desert.

Power of Minds participant Rick Hecht and his colleagues also explored what influences our eating choices in their SHINE (Supporting Health by Integrating Nutrition and Exercise) trial. In this trial, 194 obese individuals were assigned to one of two 5.5 month diet and exercise intervention programs led by strong facilitators – one that included a mindfulness component, and one that did not. At both 12 and 18 months, participants in the mindfulness program had slightly greater weight loss than participants in the other program, although the difference was not statistically significant. However, on other related measures, including fasting glucose and triglyceride/HDL ratio, the mindfulness program participants did fare statistically better than the other participants. Hecht emphasized in his conference presentation that the results have important clinical significance, in that the mindfulness intervention's impacts translated into about a 20% reduction in the risk of progressing to diabetes. Interestingly, in a follow-up study, Hecht's colleagues found that a reduction in reward-based eating (eating for pleasure rather than for hunger), more than a reduction in stress, may have been responsible for the benefits experienced by the mindfulness participants.

What stood out about this trial is the strength of the study design and control group intervention. The authors write, "To control for attention, social support, expectations of benefit, food provided during the mindful eating exercises, and home practice time in the mindfulness intervention, the control intervention included additional nutrition and physical activity information, strength training with exercise bands, discussion of societal issues concerning weight loss, snacks, and home activities." They further controlled for stress reduction benefits of mindfulness by including progressive muscle relaxation and cognitive-behavioral training, albeit at lower levels, in the mindfulness intervention. This kind of carefully matched study design raises the bar for proving the efficacy of mindfulness interventions, which would be nice to see in other studies in other intervention domains.

The same public health challenge at the heart of the SHINE trial – obesity – was the central focus of Christakis and Fowler's high profile 2007 study on the spread of shifting weight norms across social networks. The team used the "densely interconnected social network" of 12,067 participants in the Framingham Heart Study, who were assessed repeatedly on weight and other measures between 1971 and 2003. The study found that "a person's chances of becoming obese increased by 57% (95% confidence interval) if he or she had a friend who became obese in a given interval [of three years]." If one sibling became obese, the likelihood that another sibling would too increased by 40%. If a spouse became obese, the likelihood of the other spouse doing so increased by 37%. Interestingly, proximity, as measured by the influence of geographic neighbors on becoming obese, did not play a role, and the geographic distance between friends or siblings did not alter the effect of that relationship on the likelihood of becoming obese.

The interpretation of these data offered in the 2007 paper focused on the social contagion of shifting norms about weight. In her 2011 article in *Scientific American*, Katherine Harmon cites a later study that asked much more extensive questions

about weight, ideal body size, and stigma attached to being overweight or obese, and found that perhaps as little as 20% of weight status could be attributed to social norms. The researchers Harmon interviews suggest that the spread of behavior, not just attitudes, might explain more of the variance. This idea echos a common theme across the Power of Minds literature - that there may be critical mindsets that, when shifted, cause a cascade of behavior changes that effect some change in health, well-being or achievement, and which often feed back to solidify or amplify the new mindset.

Mindset can also exert its effects through biology, not just behavior. In a creative study by Power of Minds participant Ali Crum and colleagues, the experimenters manipulated subjects' beliefs about a milkshake they were about to consume, and observed the impact of those beliefs on the gut peptide ghrelin, which is secreted by the stomach's endocrine cells into the bloodstream, and then the brain, where it signals the hypothalamus to produce the sensation of hunger and desire to eat. Once food is detected in the GI tract, ghrelin levels decrease, and the feeling of satiety increases.

Forty-six participants were told that a metabolic kitchen at the Yale Center for Clinical Investigation was developing two different milkshakes with different caloric content, and that the goal of the study was to compare the taste of the two milkshakes and examine the body's responses to the different nutrient compositions of the shakes (e.g., sugar and fat). Participants would have the opportunity to try two milkshakes – one labeled "Indulgence" with 620 calories, and one labeled "Sensi-Shake" with 140 calories – receiving one milkshake in the first week's session, and the second the following week. However, participants actually received exactly the same 380-calorie milkshake in each session.

Bloodstream ghrelin was measured after overnight fasting (baseline), then again after participants were asked to view and rate the label of the shake they were about to consume (anticipatory period), and after drinking and rating the milkshake (post-consumption). Ghrelin levels rose faster during the anticipatory period and declined faster in the

post-consumption period in the Indulgent shake trials versus the Sensi-Shake trials, suggesting that participants' satiety signaling between gut and brain mirrored what they believed they were consuming – not what they actually consumed. Crum and colleagues close with the suggestion that "if we can begin to approach even the healthiest foods with a mindset of indulgence, we will experience the physiological satisfaction of having had our cake and eaten it too."

A final pair of articles in this cluster was included because they point to areas of research that need more attention. These two first-hand accounts of eating disorders by Lisa Fogarty and Michelle Konstantinovsky highlight the limitations of our understanding of eating disorders across culture, race and age. Both authors write about the power of movies that shaped the public perception of eating disorders as a problem of "young white girls." Lisa Fogarty writes about her realization over 25 years battling anorexia that her eating disorder will likely be with her for life:

"I feel anxiety every time I realize my body is going to change as I age, with or without my consent, whether I weigh 89 pounds or 289 pounds. I don't trust the body and fear the ways it can turn on you....My triggers have included puberty, leaving home for the first time, and getting pregnant. As I age, they may include watching my own children leave the nest and confronting my mortality...I refuse to call myself fully healed because there is still work to do. Some days it's easy work, other days it's work that makes me break down in tears on my husband's lap. But it's work that must be done every morning, every evening, at every meal."

Michelle Konstantinovsky writes that the stereotype that eating disorders are a white woman problem is one that won't die. She describes a 2006 study that found that "clinicians were less likely to assign an eating disorder diagnosis to a fictional character based on her case history if her race was represented as African-American rather than Caucasian or Hispanic." Although disease statistics show that eating disorders are more common in white women, those numbers may be skewed by

the widely shared *perception* that that is true, which may reduce reporting by people of color.

The author interviews Anahi Ortega, a Mexican-American woman who has been diagnosed with EDNOS – eating disorder not otherwise specified – in part because she doesn’t exhibit the official criteria for an anorexia diagnosis, which includes a “preoccupation with thinness.” Ortega points out that the beauty norms in the Latina community focus more on being “a little curvy” rather than on being “stick skinny.” Konstantinovsky interviews women from other backgrounds who similarly fall outside the expectations we have of the group “people with eating disorders,” and concludes with this:

“Eating disorders don’t care about the color of your skin or the socioeconomic status of your family. It’s not just media images that are to blame, or various cultures’ expectations of women, or genetics. It’s not just about stress, or trauma, or power and control. It’s all of it, and everyone is at risk. It’s time

for treatment, research, and funding to catch up accordingly.” Clearly, in the case of eating disorders, it’s the mindsets of the clinical and research communities that need to shift.

What can we take away from this exploration of the forces that shape our eating behavior and its impacts on our bodies? We know from legions of studies that changing eating behaviors is extraordinarily difficult; most behavioral interventions fail, and short-term successes often fade into insignificance over the long term. The NBER study suggests that improving access to healthier foods alone also isn’t sufficient. Taken together, the other studies suggest we might target mindsets that are shared by friends and family, in ways that are culturally informed rather than adhering to the expectations of the research community, and specifically focus on cultivating mindsets that will help people pay more attention to why they are eating, anticipate and enjoy what they eating, and continually influence a host of choices about the food they eat.

MINDFULNESS MEDITATION

Harrington A & Dunne JD (2015). When mindfulness is therapy. *American Psychologist* 70(7): 621-631.

Creswell DJ (2017). Mindfulness interventions. *Annual Review of Psychology* 68:491-516.

Tang Y-Y, Holzel BK & Posner MI (2015). The neuroscience of mindfulness meditation. *Nature Reviews Neuroscience* 16: 213-225.

Davidson, R. J., & Kaszniak, A. W. (2015). Conceptual and methodological issues in research on mindfulness and meditation. *American Psychologist* 70(7): 581–592.

Van Dam NT, van Vugt MK, Vago DR, Schmalzl L, Saron CD, Olendzki A, Meissner T, Lazar SW, Kerr CE, Gorchov J, Fox KCR, Field BA, Britton WB, Brefczynski-Lewis JA & Meyer DE (2017). Mind the Hype: A Critical Evaluation and Prescriptive Agenda for Research on Mindfulness and Meditation. *Perspectives on Psychological Science* 13(1): 36-61.

Mindfulness meditation is all over the map – literally, and figuratively. Worldwide interest in mindfulness meditation has exploded in the last decade, but Harrington and Dunne (2015) address a growing critique of this explosion, proposing that “mindfulness was never supposed to be about weight

loss, better sex, helping children perform better in school, helping employees be more productive in the workplace, or even improving the functioning of anxious, depressed people. It was never supposed to be a merchandised commodity to be bought and sold. And it was certainly never developed in

order to create 'optimal warriors' capable of better withstanding stress in the battlefield, including the stress which comes from intentionally killing another human being." The authors propose that critics of mindfulness meditation rarely take issue with the claim that it accomplishes at least some of its therapeutic aims. Rather, people more familiar with mindfulness meditation's origins and evolution seem concerned with the attention aimed at making mindfulness meditation so pragmatic, and in doing so, separating it from the broader contexts in which it was developed. The authors write, "Simply teaching 'bare attention' without attending to the cultivation of wisdom and discernment risks making mindfulness training hostage to values that are tangential or even anathema to the traditions from which the practice arose."

Harrington and Dunne explore the popular history of meditation in the US, starting with D.T. Suzuki's attempts in the 1950s and '60s to transform aspects of Zen Buddhism into resources for psychotherapy, through the 1970s interest in transcendental meditation and its utility for stress reduction outside of any spiritual context, and then into the 1980s and beyond with the rise of Jon Kabat-Zinn's mindfulness-based stress reduction (MBSR), which "emerged as a practice that seemed at once medical and spiritual... a method of stress-reduction, or a path to brain rewiring, and a means to profound ethical transformation all at the same time." In their historical review, Harrington and Dunne connect each era's dominant form of meditation to other cultural forces important in that moment. But they don't fully account for the explosion of interest in both medical/scientific applications of mindfulness meditation, or for the intense commercial activity and popular interest that surrounds it.

Creswell (2017) hints at a possible accounting with his working definition of mindfulness:

"Mindfulness is a process of openly attending, with awareness, to one's present moment experience. This process of awareness of present moment experience contrasts with much of our daily life experience, in which we often find ourselves unintentionally letting our minds wander, running on automatic pilot, or suppressing unwanted experiences." It isn't hard to imagine how the grand forces of the 1990s and 2000s, like the rise of the Internet,

the 24/7 news cycle, globalization, secularization, and the explosion of social media, might have created a greater need to actively seek awareness in the present moment than most of humanity has ever encountered before. But Creswell focuses most of his review on the burgeoning scientific and medical interest in mindfulness.

MBSR, says Creswell, is probably the most well-known mindfulness meditation intervention in the scientific literature. He writes, "MBSR consists of weekly 2–2.5-hour group-based classes with a trained teacher, daily audio-guided home practice (approximately 45 min/day), and a day-long mindfulness retreat (occurring during week 6 of the 8-week program). Much of the MBSR program focuses on learning how to mindfully attend to body sensations through the use of body scans, gentle stretching, and yoga mindfulness exercises, along with discussions and practices geared toward applying mindful awareness to daily life experiences, including dealing with stress." Over time, he says MBSR has been adapted for use in specific situations, including mindfulness based cognitive therapy (MBCT) for treating depression, mindfulness based relapse prevention (MBRP), healthy eating, and mindfulness based relationship enhancement (MBRE). The most successful interventions in terms of clinical efficacy are multi-week, multi-engagement models or intensive engagements, like weekend retreats; the impact of mindfulness apps has not been well-studied and brief attention induction approaches have shown only small effects.

Creswell highlights large randomized control trials that have shown significant effects of mindfulness interventions across multiple domains:

»Physical health: which Creswell writes is most likely due to a reduction in stress-related health outcomes. In chronic pain, mindfulness interventions have reduced pain severity, pain interference with daily life, pain-related stress, and catastrophizing. Several studies have shown lasting benefits over a period of months. Other mindfulness interventions have reduced physical symptoms and/or improved quality of life in fibromyalgia, irritable bowel syndrome, and breast cancer.

»Immune system function: mindfulness interventions may reduce markers of proinflammation, including circulating blood markers of C-reactive protein, interleukin 6, and the stress-induced inflammatory skin flare response (note that several of these studies were authored by Power of Minds conference participant Melissa Rosencrantz). Mindfulness interventions have also proven effective at slowing declines or increasing CD4+ T lymphocyte counts in stressed HIV-positive adults.

»Mental health: The strongest data show that mindfulness interventions reduce depression relapse rates in at-risk individuals and improve substance abuse treatment outcomes. Other well-controlled studies show that mindfulness interventions can reduce anxiety, depression and PTSD symptoms.

»Cognitive and affective outcomes: Mounting RCT evidence suggests that mindfulness interventions can improve sustained attention and working memory, and reduce rumination.

Creswell cites more limited (but not negative) evidence that mindfulness interventions could improve health behaviors like quitting smoking and limiting reward-based eating; interpersonal outcomes (relationship satisfaction and prosocial behaviors); anxiety and depression around pregnancy and childbirth; markers of healthy aging (e.g., executive function, inflammation); and stress, behavior and cognitive performance in school (especially among minority children).

There may be psychological risks of participating in mindfulness interventions, says Creswell, especially for people who have experienced trauma or who may be participating in longer-term, intensive (often residential) mindfulness interventions. But when interventions like MBSR or its close relatives are employed under the supervision of trained instructors, they carry minimal risks, and in fact may have the greatest benefits for high-trauma and high-stress populations.

Creswell also touches on mechanisms and challenges in experimental design in his review, but these topics are explored more deeply by Tang et al., Davidson and Kraszniak, and Van Dam et al. Tang et al. (2015) extensively reviewed the literature on brain mechanisms of mindfulness meditation. They identify three major cognitive features of mindfulness meditation and the brain regions that likely mediate them: attention control (anterior cingulate cortex and striatum), emotion regulation (multiple prefrontal regions, limbic regions, and the striatum), and self-awareness (insula, medial prefrontal cortex and posterior cingulate cortex and precuneus). Both changes in brain activity within these regions and changes in functional connectivity between them have been observed in association with mindfulness meditation. Tang et al. also address the role of the default mode network (DMN), which includes midline structures of the brain including medial prefrontal cortex, posterior cingulate cortex, anterior precuneus, and inferior parietal lobule. These regions, the authors write, “show high activity during rest, mind wandering and conditions of stimulus-independent thought, and have been suggested to support diverse mechanisms by which an individual can ‘project’ themselves into another perspective. fMRI studies have investigated activity in the DMN in association with mindfulness practice. Regions of the DMN (the medial PFC and PCC) showed relatively little activity in meditators compared to controls across different types of meditation, which has been interpreted as indicating diminished self-referential processing.”

Just how these brain changes occur is not at all clear. Tang et al. write, “It is possible that engaging the brain in mindfulness affects brain structure by inducing dendritic branching, synaptogenesis, myelinogenesis or even adult neurogenesis. Alternatively, it is possible that mindfulness positively affects autonomic regulation and immune activity, which may result in neuronal preservation, restoration and/or inhibition of apoptosis. It is well known that mindfulness-based techniques are highly effective in stress reduction, and it is possible that such stress reduction may mediate changes in brain function. A

combination of all of these mechanisms may even occur.”

They call for more research in three areas: 1) the decoding of mental states during mindfulness meditation, with more of a focus on functional connectivity in brain networks than on activity changes within specific brain regions; 2) individual differences in response to mindfulness meditation; and 3) understanding mechanisms of mindfulness meditation in mental illness. Tang et al. conclude by advocating for more rigorous studies that use “longitudinal, randomized and actively controlled research designs and larger sample sizes to advance the understanding of the mechanisms of mindfulness meditation in regard to the interactions of complex brain networks,” and “connects neuroscientific findings with behavioural data.”

These appeals for more rigorous research are echoed by Davidson and Kraszniak (2015), and Van Dam et al. (2017). Taken together, these reviews outline an agenda for future mindfulness meditation research that could strengthen not only our knowledge about the efficacy and mechanisms of mindfulness meditation, but also a broader understanding of human cognition and mind-body connections. At the highest level, write Van Dam et al., the field needs to deal with inherent semantic ambiguities associated with mindfulness terminology, and adopt more precise terminology referring to the mental and physical states and behaviors generally associated with the word “mindfulness.” (Similar concerns have been raised in conjunction with studies of the placebo effect.) Davidson and Kraszniak also call for additional clarity, in the form of much richer descriptions of mindfulness interventions, including what is being taught, how and by

whom, and how much and what kind of practice each participant engages in. Both groups call for increased rigor in experimental design, with Davidson and Kraszniak focusing on better control group design and increased use of “dual-blind” designs in which subjects do not know which intervention is the focus of the research, and researchers do not know to which group subjects have been assigned. Van Dam et al. implore researchers to use pre-registered experiments and open-science replications, and conclude with calls for researchers to be modest and responsible in the ways in which they generalize their findings, especially those that involve neural mechanisms, to clinical application.

One scholar interviewed for the Power of Minds project (and who wished to remain anonymous) told us that “the mindfulness moment has passed.” Given the widespread frustration in the academic community with the quality of research on mindfulness interventions, that may well be true...within academia. But mindfulness as a popular concept is clearly still going strong, and patients struggling with chronic illness for whom there may be few other effective treatments are unlikely to give up easily on mindfulness interventions that work for them. The fact that MBSR and related interventions have been fairly well defined and operationalized, and can be deployed through a network of trained practitioners, provides a strong foundation for potential future research, as do the increasingly clear criteria for what rigorous research looks like. But it may be the cultural moment, and the needs of a society living with high stress, sensory and information overload, and chronic health problems that decide whether mindfulness meditation secures its place in the cultural mainstream, or evolves into something new.

PAIN AND PLACEBO

Specter M (2011). The Power of Nothing. *The New Yorker*, 12/12/11.

Benedetti F (2014). Placebo Effects: From the Neurobiological Paradigm to Translational Implications. *Neuron* 84(3): 623-637.

Peerdeman KJ, van Laarhoven AIM, Peters ML & Evers AWM (2016). An integrative review of the influence of expectancies on pain. *Frontiers in Psychology* 7: 1270.

Wager TD & Atlas LY (2013). How is pain influenced by cognition? Neuroimaging weighs in. *Perspectives on Psychological Science* 8(1): 91-97.

Tinnermann A, Geuter S, Sprenger C, Finsterbusch J & Büchel C (2017). Interactions between brain and spinal cord mediate value effects in nocebo hyperalgesia. *Science* 358 (6359): 105-08.

Carvalho C, Caetano JM, Cunha L, Rebouta P, Kaptchuk TJ & Kirsch I (2016). Open-label placebo treatment in chronic low back pain. *Pain* 157(12): 2766-2772; erratum 158(2): 365.

Mestre TA & Ferreira JJ (2017). Are placebo pills presented as experimental treatment a true placebo? *Pain* 158 (3): 535.

Traeger AC & Kamper SJ (2017). The effect of nothing? Time to abandon the concept of placebo. *Pain* 158(6): 1159.

Howe LC, Goyer JP & Crum AJ (2017). Harnessing the placebo effect: Exploring the influence of physician characteristics on placebo response. *Health Psychology* 36(11): 1074-82.

Hoffman KM, Trawalter S, Axt JR & Oliver MN (2016). Racial bias in pain assessment and treatment recommendations, and false beliefs about biological differences between blacks and whites. *Proceedings of the National Academy of Sciences* 113(16): 4296-301.

The placebo effect is at the very heart of what we understand – and much of what we still don’t know – about the way our beliefs can directly influence our bodies. As neuroscientist and placebo expert Fabrizio Benedetti writes in his 2014 review:

“A placebo is an inert treatment with no specific therapeutic properties, whereas the placebo effect is the response to the inert treatment. Although this is the most common definition, it is not completely correct, for placebos are made of many things, such as words, rituals, symbols, and meanings. Thus, a placebo is not the inert treatment alone, but rather its administration within a set of sensory and social stimuli that tell the patient that a beneficial therapy is being given. Indeed, a placebo is the whole ritual of the therapeutic act.”

Ted Kaptchuk, a scientist and healer himself, echoes that definition in his comments in “The Power of Nothing,” when he says he has “always believed there is an important component of medicine that involves suggestion, ritual and belief – all ideas that make scientists scream.” And therein lies the problem. How do you operationalize and study a

patient’s subjective beliefs, the interpersonal dynamics between a patient and healer, the context and ritual in which a treatment is given, and dependent variables that may also be highly subjective, like pain? And how do you acknowledge this complexity when the most common use of “placebo” in research is as a control, the set of neutral experimental conditions against which a *real* treatment is to be compared?

Michael Specter’s article “The Power of Nothing” presents an engaging, high-level history of the study of the placebo effect, briefly highlighting a number of critical advances in research since the landmark 1955 article by Henry Beecher, “The Powerful Placebo.” Specter notes that Beecher’s studies were flawed, but had enormous impact in shaping the processes by which the impacts of new drugs are assessed, which almost always involve comparison to a “sham” or placebo intervention. Specter surveys a number of recent findings that explore the boundary conditions that define when, how, and for whom the placebo effect works, including, for example, the discovery that people with

Alzheimer's disease do not seem to benefit from the placebo effect, perhaps because they are much less able to anticipate the future.

Benedetti highlights advances in understanding the placebo effect that have come from studying its neurobiological and physiological underpinnings, including:

»There is no single neural system that mediates the placebo response, but the involvement of the endogenous opioid system has been well-documented. Recent neuroimaging experiments have shown that placebo activates μ -opioid neurotransmission in the dorsolateral prefrontal cortex, the anterior cingulate cortex, the insula, and the nucleus accumbens – brain regions involved in mediating reward, fear, expectation, and anxiety, among other things. Dopaminergic signaling in some of these regions likely also contributes to the placebo effect.

»A flurry of recent brain imaging studies have helped define two phases of the placebo effect: the expectation phase of analgesia and the pain inhibition phase. Brain regions active during expectation include the anterior cingulate, prefrontal cortex, and the periaqueductal gray. During pain inhibition, deactivations are found in the cingulate, superior temporal and precentral gyri, insula, claustrum and putamen, thalamus and caudate. Benedetti states that “many of the regions that are activated during expectation are likely to belong to a descending pain inhibitory system that inhibits different areas involved in pain processing.”

»“Any previous exposure to drugs can produce huge placebo responses through learning.” The effects of this kind of learning, beyond setting up powerful expectations, may also be mediated in part through immune (interleukin-2 (IL-2) and interferon- γ (IFN- γ)) and hormonal (growth hormone, cortisol) systems, both of which can be shaped by previous experience and expectation.

Placebos and drugs may share common biochemical pathways, such as the endogenous opioid system, the endocannabinoid system, the cyclooxygenase pathway, and the dopaminergic system, but they differ in duration of action (placebo is shorter), variability of response (more with placebo), and average magnitude of effect (smaller with placebo, but can be larger in individual patients).

Benedetti closes with a helpful list of recommendations and caveats for future placebo research and application which is too lengthy to include here, but worth visiting for researchers starting to explore the field.

Peerdeman et al. (2016) dive deep into the role of expectancies in pain and the placebo effect in ways that might be helpful to researchers in other fields. They distinguish three major types of expectancies. Outcome expectancies are about what a person thinks will *happen*. These can focus on (1) a stimulus – e.g., How big will that needle be? – or (2) a response – e.g., “If I take this pill, will I feel less nausea?” Response expectancies, the authors claim, probably exert the strongest and more direct influence on pain, but stimulus expectancies are far less studied, and need more attention. A third kind of expectancy focuses on self-efficacy, e.g., “Will I be able to cope with the pain I anticipate?” Self-efficacy expectancies predict pain tolerance and effort expended on coping with pain, and correlate with chronic pain severity. These three types of expectancy can operate independently or in concert, and combine with emotions and cognitive states to create multifaceted constructs, like optimism, hope, trust, worrying, and catastrophizing, which may have stronger explanatory power than the expectancies alone. For example, Peerdeman et al. write that:

“Individuals who catastrophize often have negative response expectancies (e.g., that the pain may not go away), feel helpless about controlling their pain (i.e., low self-efficacy expectancies), are anxious, and worry and/or ruminate about their pain. Pain catastrophizing is thus a comprehensive construct that involves different kinds of negative expectancies and related cognitions and emotions.

Pain catastrophizing has consistently been linked to higher acute and chronic pain intensity, pain-related disability, and distress."

Peerdeman et al. close with a call for stronger theoretical models of interacting expectancies and research designs that can probe longer-term effects of expectancies on pain, and additional research into how multiple strategies for expectancy intervention can be optimally combined.

Wager and Atlas (2013) echo the need for strengthening models and measures of pain and the factors that influence pain perception. "To assess pain independent of self-report," they write, "one needs to be able to measure the hidden biological processes that cause and define pain." Since the experience of pain is constructed in the brain, neuroimaging brain activity could provide a biomarker of pain, which would add an important, less subjective measure of pain to self-report. Furthermore, they write, neuroimaging can help "constrain the space of possible theories about how placebos work." For example, placebos might work because they bias pain reporting; a patient who receives a treatment might worry that reporting persistent pain would reflect badly on her or her health care provider. If self-report of pain is your only measure, you wouldn't be able to distinguish between changes in a patient's *decision making* about what to report, and actual changes in the patient's *experience* of pain. Neuroimaging experiments have added clarity to this conundrum, showing that placebo-induced reductions in brain activity were found in a number of pain-processing regions of the brain. Recent neuroimaging data by Christian Büchel and colleagues have shown placebo and nocebo effects in the spinal cord, which Wager and Atlas write would be "difficult to explain other than by engagement of descending pain-modulation systems." These experiments make a strong case for the role of direct modulation of pain experience by placebos and nocebos, and are just one example in which neuroimaging can help define and constrain the theoretical foundations of the placebo effect.

Three recent experimental studies illustrate some of the new horizons opening up in pain and placebo work. Carvalho et al. (2016) conducted an "open label" trial for the treatment of back pain in which they tested whether subjects would get relief from a placebo if they were told the treatment was a placebo and informed about how the placebo effect works. Ninety-seven patients in Lisbon, Portugal with chronic lower back pain were recruited for a study they were told would test "a novel mind-body clinical study of chronic low back pain," a condition that causes more disability than any other ailment. Subjects were randomly assigned to a treatment as usual (TAU) group, or a treatment as usual *plus* open-label placebo group. This design was meant to address ethical concerns with physicians knowingly giving patients a treatment with no known efficacy, and to test the "received wisdom that clinical administration of a placebo requires deception (or double-blind conditions) to be effective." All patients were told that they would be randomly assigned, and that if they were assigned to the TAU group, they would be given the chance to take the placebo treatment after the first 3 weeks.

All subjects were given the same information about the placebo effect in a 15-minute session, and then both patient and provider learned which group the patient had been assigned to. Patients in the open label placebo group were given a bottle of orange gelatin capsules marked "placebo pills" and told to take 2 pills twice daily. After 3 weeks, patients taking placebo pills reported significantly less pain on three numeric rating scales, and reduced disability, all with moderate or large effect sizes. When TAU patients started taking the placebo pills after 3 weeks, they also showed significant reductions in pain and disability.

In a *Science Daily* interview, author Ted Kaptchuk said, "This new research demonstrates that the placebo effect is not necessarily elicited by patients' conscious expectation that they are getting an active medicine, as long thought. Taking a pill in the context of a patient-clinician relationship – even

if you know it's a placebo – is a ritual that changes symptoms and probably activates regions of the brain that modulate symptoms."

But other scholars reacted differently, and formally responded to the study in a series of comments made to the publishing journal, *Pain*. Mestre and Ferreira (2017) expressed primarily procedural concerns, including that of 239 people who completed screening, only 121 were deemed eligible or agreed to participate, leaving open the possibility that the group self-selected to some extent when told about the "novel mind-body clinical study." They also noted the short duration of the study, and questioned whether a nocebo effect might have been at work in patients in the TAU group who were told they would have to wait three weeks to take the placebo (and were not informed about the nocebo effect). Somewhat oddly, Mestre and Ferreira also suggest that the authors cannot know whether patients taking the placebo were also taking additional analgesics even though they were asked not to change their medication regimen. Unreported self-medication is always an issue in clinical trials, but is rarely raised as a primary concern by reviewers, suggesting, perhaps, that Mestre and Ferreira start from a position of skepticism about the results.

Traeger and Kamper's (2017) concerns were more philosophical. They write, "Placebos occupy difficult scientific territory where apparently large effects are attributed to a substance, that is, by definition, inactive. Others have pointed out the flaw in this logic; an agent cannot be both inert and responsible for an effect...In our view, labelling such effects as 'placebo' is unhelpful because it hides the fact that we do not understand what is responsible for the effect. The term complicates and obstructs efforts to understand the effects and mechanisms of medical treatments." They suggest that researchers abandon the term "placebo" and instead use clearer, more precise language about their hypotheses and the factors – like expectations, hope, attitudes, etc. – that they believe may actually be at work.

Howe et al. (2017) did exactly this: they identified hypotheses about two *interpersonal* factors that might influence expectations and experience of a treatment in an experimental setting. While much

of the work on the placebo effect focuses on the person who may experience it, Howe et al. focused on two characteristics of the physician providing treatment – warmth and competence – recognizing that these characteristics may account for some of the variability in placebo and nocebo effects.

The researchers recruited 164 healthy subjects under the guise of recruiting them for a study about food preferences, for which they were told they would need to undergo an initial health screening. At the "screening," they were given an allergy skin prick "test" with histamine, which elicits a raised bump (a wheal) and redness on the skin, effects which have been previously shown to be influenced by placebo and nocebo effects. Shortly afterwards, the provider applied an unscented hand lotion to the red area and verbally communicated positive expectations (i.e., the cream would reduce redness and itching) or negative expectations (i.e., the cream would increase redness and itching.)

The provider of the test was a female physician trained to exhibit low or high competence, and low or high warmth, conditions that were scripted and included verbal cues (e.g., ask for patient's name or not), nonverbal cues (e.g., eye contact, smiling, physical distance), procedural competence cues (e.g., put blood pressure cuff on right or wrong), status cues (e.g., name tag indicating status as student doctor or fellow) and environmental cues (e.g., messiness of screening room).

Subjects' ratings of the provider aligned with the intention of the provider to appear more or less warm, and more or less competent. When subjects received the skin prick and cream from a provider who was both more warm and competent, and were told by the provider that the cream would help, the size of their skin wheals decreased significantly compared to all other conditions. Receiving negative expectations about the impact of the cream in the high-warmth, high-competence condition did not affect the skin wheal, nor did receiving positive expectations by a provider who was not both warm and competent. The authors conclude that "the placebo effect can be boosted or diminished by social context," and that this study helps unpack "the active ingredients underlying placebo effects and helps to shed light on a longstanding

puzzle, providing a potential reason why placebo effects sometimes appear potent, and sometimes appear ineffectual.”

Hoffman et al. (2016) also explored the impact of beliefs on pain management in the patient-provider relationship, focusing on how biased and false health care provider beliefs can influence provider perceptions of patient pain and treatment recommendations. Previous studies showed that in the U.S., black patients are less likely to be given pain medications than white patients, and when they do receive medication, they are given lower amounts – disparities seen even in young children. In this study, the authors “examined the extent to which beliefs about biological differences between blacks and whites (e.g., beliefs that blacks have thicker skin than do white people or that black people’s blood coagulates more quickly than white people’s blood) are associated with racial bias in pain perception and treatment recommendations.”

The researchers gave two mock medical cases about a black and a white patient to 222 medical students and residents who were white, born in the U.S., and native English speakers. The subjects were asked to make pain ratings and treatment recommendations for each case, and they also completed a measure of beliefs about biological differences between blacks and whites. Beliefs probed included some statements that are false (e.g., whites have larger brains than blacks, blacks have stronger immune systems than whites, blacks’ nerve endings are less sensitive than whites), and statements that are true (e.g., whites are less susceptible to heart disease than blacks, blacks have stronger, denser bones than whites). On average, subjects endorsed 12% of the false beliefs, and about 50% reported that at least one of the false belief items were possible, probably true, or definitely true.

Subjects who endorsed false beliefs about

differences between blacks and whites rated black patients as feeling less pain than white patients. Greater race bias in pain ratings was, as expected, associated with less accuracy in treatment recommendations. Interestingly, subjects who did not endorse false beliefs showed bias in the other direction, rating the pain of the black patient higher, but showed no bias in the accuracy of their treatment recommendations.

The authors note that although effect sizes were small, the practical implications are important: “[health care providers in training] endorsing more false beliefs rated the pain of a black (vs. white) patient half a scale point lower and were less accurate in their treatment recommendations 15% of the time.” They conclude by saying the study “demonstrates that beliefs about biological differences between blacks and whites – beliefs dating back to slavery – are associated with the perception that black people feel less pain than do white people and with inadequate treatment recommendations for black patients’ pain.”

Pain is a near-universal human experience, and these studies along with many others in the vast placebo effect literature show the power of beliefs to shape the human experience of pain. Exciting new research efforts could further separate and examine independently the components of the placebo and nocebo effects (assuming those names remains in use!), explore boundary conditions for their effectiveness, develop biomarkers that will allow more objective measurement of pain to complement important self-reports of pain experience, and identify areas for intervention, like correcting aberrant physician beliefs, shifting patient expectations and attitudes, or helping physicians convey warmth and competence in order to help their patients get the full benefit possible from any treatment, placebo or otherwise.

PURPOSE AND HUMAN FLOURISHING

Hill PL & Turiano NA (2014). Purpose in life as a predictor of mortality across adulthood. *Psychological Science* 25(7): 1482-86.

Hill PL, Turiano NA, Mroczek DK & Burrow AL (2016). The value of a purposeful life: sense of purpose predicts greater income and net worth. *Journal of Research in Personality* 65: 38-42.

Kim ES, Strecher VJ & Ryff CD (2014). Purpose in life and use of preventive health care services. *Proceedings of the National Academy of Sciences* 111(46): 16331-6.

McKnight PE & Kashdan TB (2013). Purpose in life as a system that creates and sustains health and well-being: An integrative, testable theory. *Review of General Psychology* 13(3): 242–251.

Keyes CLM (2005). Mental Illness and/or Mental Health? Investigating Axioms of the Complete State Model of Health. *Journal of Consulting and Clinical Psychology* 73(3): 539-48.

At face value, having a sense of purpose in life – or not – seems as if it would be a fundamental driver of human behavior and well-being. But the study of purpose, its impacts, and interventions to enhance it appear to be in their infancy. Compared to the wealth, maturity, and quality of research on pain and placebo, research on purpose lacks common operational definitions, theoretical foundations, tools (relevant databases, common study designs, validated measures and scales, etc.), interventions, and interdisciplinary attention.

That said, there are some tantalizing early indicators that paying more attention to the impacts of having a strong sense of purpose in life may be warranted. For example, Hill and Turiano (2014) found that having a sense of purpose in life predicted greater longevity. The authors used data from the Mid-Life in the United States (MIDUS) sample of people 20–75 years. They measured purpose in life by looking at more than 6000 participants' Likert scale (1=strongly disagree to 7=strongly agree) responses to three statements: "Some people wander aimlessly through life, but I am not one of them"; "I live life one day at a time and don't really think about the future"; and "I sometimes feel as if I've done all there is to do in life." In their analysis, they also included participants' responses to two statements about social relationships with others, and twelve items assessing positive and negative affect. Items were chosen based on relevance to life purpose as identified in previous studies.

The authors used a proportional hazards model to assess the effects of purpose variables, demographic variables (age, gender, race, education), and interactions of age and purpose, and retirement and purpose, on age at death. They found that for every one standard deviation increase in purpose, the risk of dying over the next 14 years diminished

by 15%. This effect cannot be explained solely by the indicators of psychosocial and affective well-being, and the benefits of purpose are not conditional on retirement. Measured effects were relatively weak, and the authors noted several ways in which future studies could be strengthened (a more diverse sample, and more comprehensive measures of purpose in life).

Hill et al. (2016) used the same MIDUS sample and the same three core questions about purpose to investigate whether having a sense of purpose might also predict income and net worth. They also used participant responses to a Big Five personality trait inventory, a question about life satisfaction ("How satisfied are you with your life right now?" on a scale of one to four), household income, and household net worth (data for individual income and net worth appeared to be unavailable). Regression analyses showed that sense of purpose had a significant, unique positive association with both financial outcomes. Individuals with a higher sense of purpose in life tended to have higher household incomes and net worth at the start of the study, and over time, a one standard deviation increase in purpose was associated with a unique increase of \$4,461 in income and \$20,857 in net worth, controlling for the other variables. Age modified the impact of purpose on income and wealth, such that for adults aged 25-33, having a strong sense of purpose was weakly associated with having lower net worth. For adults aged 34-42, the association between purpose and net worth was insignificant, but for adults older than 42, the association was always positive and increased in strength with age.

Kim et al. (2014) used a different US dataset to explore the associations between purpose in life and willingness to use preventive health care services (the latter of which declines with age). The

authors examined responses of more than 7,000 participants over 50 who were tracked for six years as part of the Health and Retirement Study. Similar to Hill et al.'s approach to measuring purpose, this study used ratings of the degree (on a scale of one to seven) to which participants endorsed statements such as, "I have a sense of direction and purpose in my life," and "My daily activities often seem trivial and unimportant to me." Participants were asked gender-specific questions about the preventive health services they had used in the previous two years, including flu shots, blood cholesterol measurements, colonoscopies, mammograms, and prostate cancer screening, and were also asked whether they had been hospitalized overnight, and if so, for how many nights. Regression analysis showed that in models that adjusted for age, race/ethnicity, marital status, education level, total wealth, insurance status, and an index of major chronic illnesses, people with higher purpose in life were significantly more likely to get a colonoscopy, cholesterol test, mammogram, pap smear, or prostate cancer screening. Higher purpose in life also predicted fewer nights spent in the hospital.

So a sense of purpose – as measured by a handful of direct questions and related psychosocial and affective variables – may predict beneficial health behaviors, financial success, and longevity. What is this remarkable force, and how might it exert its influence over the lifespan? McKnight and Kashdan set out to answer these questions in their helpful conceptual 2009 review, defining purpose as:

"...a central, self-organizing life aim that organizes and stimulates goals, manages behaviors, and provides a sense of meaning. Purpose directs life goals and daily decisions by guiding the use of finite personal resources. Instead of governing behavior, purpose offers direction just as a compass offers direction to a navigator; following that compass (i.e., purpose) is optional. Living in accord with one's purpose, however, offers that person a self-sustaining source of meaning through goal pursuit and goal attainment. Furthermore, purpose

is woven into a person's identity and behavior as a central, predominant theme – central to personality as well... The presence of a purpose is expected to lead to greater persistence than other important life goals because a central, self-organizing life aim resonates across time and context."

McKnight and Kashdan note that purpose has features in common with religiosity, meaning, spirituality, and goal-setting, but that it differs from all of these concepts as well. Purpose is not essential to life, may not be available to all people, and may give a person meaning without being easily recognizable or articulated. The authors write, "purpose is not a mere product of faith, meaning, or personal agency. Meaning does not always drive purpose; rather, meaning probably drives the development of purpose." They define goals as being "more precise [than purpose] in their influence of proximal behaviors," and distinguish purpose as providing "a broader motivational component that stimulates goals and influences behavior."

The authors believe that purpose isn't a binary "you have it or you don't" feature of human experience, but rather a three-dimensional continuum that incorporates scope, strength, and awareness. Scope "refers to how ubiquitous the purpose is in a person's life...A purpose with a broad scope will be less organized but also influence a greater range of behaviors across a wider context." Strength, they write, is "described best as the tendency for the purpose to influence the actions, thoughts, and emotions in the domains that are relevant to its scope." And awareness "reflects the extent to which a person is aware and can articulate her purpose... Awareness decreases cognitive load by integrating motivation and behavior into a person's cognitive architectural framework."

The authors explore how purpose might appear (even if not named and operationalized as such) in fields including social psychology, economics, evolution, emotion research, and psychoneuroimmunology. They then explore some of the consequences of purposeful living, and use two terms that are curiously common across several other studies we

reviewed in the purpose literature: buffering and congruence. McKnight and Kashdan talk about the capacity of purpose to “buffer” against the impact of extreme stress or trauma. Power of Minds conference participant Anthony Burrow spoke about his research showing that a strong sense of purpose in life “buffered” against the usually stressful experience of riding in a train car with an increasingly diverse group of passengers. On congruence, McKnight and Kashdan write, “Our perspective on purpose is consistent with behavioral congruence models of personality that suggest people derive the greatest positive experiences when they participate in activities congruent with their habits and predispositions (i.e., dominant personality traits) and the least pleasure when there is discord.”

Purpose is one of several key features of a reconceptualized understanding of mental health as not just the absence of health (languishing), but also the presence of flourishing as described by Power of Minds conference participant Corey Keyes (2005). Keyes proposes a new set of criteria for mental health (flourishing):

Hedonia – requires high level on at least one of the following:

- »Regularly cheerful, in good spirits, happy, calm and peaceful, satisfied, and full of life (positive affect past 30 days)
- »Feels happy or satisfied with life overall or domains of life (avowed happiness or avowed life satisfaction)

Positive functioning – requires high level on six or more of the following:

- »Holds positive attitudes toward oneself and past life, and concedes and accepts varied aspects of self (self-acceptance)
- »Has positive attitude toward others while acknowledging and accepting people’s differences and complexity (social acceptance)

- »Shows insight into own potential, sense of development, and is open to new and challenging experiences (personal growth)
- »Believes that people, social groups, and society have potential and can evolve or grow positively (social actualization)
- »Holds goals and beliefs that affirm sense of direction in life and feels that life has a purpose and meaning (purpose in life)
- »Feels that one’s life is useful to society and the output of one’s own activities are valued by or valuable to others (social contribution)
- »Exhibits capability to manage complex environment, and can choose or manage and mold environments to suit needs (environmental mastery)
- »Interested in society or social life; feels society and culture are intelligible, somewhat logical, predictable, and meaningful (social coherence)
- »Exhibits self-direction that is often guided by his or her own socially accepted and conventional internal standards and resists unsavory social pressures (autonomy)
- »Has warm, satisfying, trusting personal relationships and is capable of empathy and intimacy (positive relations with others)
- »Has a sense of belonging to a community and derives comfort and support from community (social integration)

In Keyes’ view, complete mental health is both the absence of illness and the presence of many of these factors. He points out that the dominant focus on identifying illness “assumes that classifying and monitoring the mental health status of individuals, groups, or populations is worthless. Individuals free of mental illness are assumed to be homogenous, functioning about the same and markedly better

than mentally ill individuals.” Adding new criteria that are separate from, but complementary to, the criteria used to assess illness, should yield a much more complete picture of mental health. Keyes tested this idea with MIDUS survey participants, who were interviewed by telephone and then asked to complete two self-administered questionnaires with additional questions from scales of psychological and social well-being that aligned well with Keyes’ mental flourishing criteria above. When these data were combined with survey data on mental illness, Keyes concluded that 16.6% of the 1,850 respondents for whom complete data were available had complete mental health. These people “reported the

fewest health limitations of activities of daily living, the fewest missed days of work, the fewest half-day work cutbacks, and the healthiest psychosocial functioning (low helplessness, clear life goals, high resilience, and high intimacy).”

Research on purpose and human flourishing is still in its early days, and interventions to increase purpose and flourishing are few and far between – in part because much work remains to be done in operationalizing these concepts and developing tools for their measurement. Hopefully, these areas will be fruitful areas of interdisciplinary activity in the coming years.

REFRAMING THE ROLE OF CULTURE

Downey G & Lende D (2009) Why Neuroanthropology? Why Now? The conference statement for The Encultured Brain: Building Interdisciplinary Collaborations for the Future of Neuroanthropology. Accessed online on 01/21/18 at neuroanthropology.net/2009/10/08/the-encultured-brain-why-neuroanthropology-why-now/.

Hatzenbuehler ML, Phelan JC & Link BG (2013). Stigma as a fundamental cause of population health inequities. *American Journal of Public Health* 103(5): 813-21.

Lee B (2013). The role of stigma in health disparities (comment on “Stigma as a fundamental cause of population health inequities”). *American Journal of Public Health* 103(8): e4.

Hatzenbuehler ML, Phelan JC & Link BG (2013). Hatzenbuehler et al. respond. *American Journal of Public Health* 103(8): e4-5.

Cook JE, Purdie-Vaughns V, Meyer IH & Busch JTA (2014). Intervening within and across levels: a multilevel approach to stigma and public health. *Social Science and Medicine* 103: 101-09.

Zimmerman RS (2017). Importance of resilience research and multi-level interventions. *Social Science and Medicine* 190: 275-77.

Li X, Harrison SE, Fairchild AJ, Chi P, Zhao J & Zhao G (2017). A randomized controlled trial of a resilience-based intervention on psychosocial well-being of children affected by HIV/AIDS: effects at 6- and 12-month follow-up. *Social Science and Medicine* 190: 256-64.

The Climb Chronicles: Stories from the CLIMB consensus group (2017). K Nadolski, L Rodriguez & MT Fullilove, Eds. Accessed online on 01/15/18 at <http://www.hiketheheights.org/home/climb-chronicles>.

Power of Minds conference participant Daniel Lende made an impassioned case for the brain being the critical link between culture, mind and body in his 2009 conference statement (with colleague Greg Downey) for “The Encultured Brain”:

“...forms of enculturation, social norms, training regimens, ritual, and patterns of experience shape how our brains work and are structured. But the predominant reason that culture becomes embodied, even though many anthropologists overlook it, is that neuroanatomy inherently makes experience material. Without material change in the brain, learning, memory, maturation, and even trauma could not happen. Neural systems adapt through long-term refinement and remodeling, which leads to deep enculturation. Through systematic change in the nervous system, the human body learns to orchestrate itself as well as it eventually does. Cultural concepts and meanings become anatomy.

Although every animal’s nervous system is open to the world, the human nervous system is especially adept at projecting mental constructs onto the world, transforming the environment into a sociocognitive niche that scaffolds and extends the brain’s abilities. This niche is constructed through social relationships, physical environments, ritual patterns, and symbolic constructs that shape behavior and ideas, create divisions, and pattern lives. Thus, our brains become encultured through reciprocal processes of externalization and internalization, where we use the material world to think and act even as that world shapes our cognitive capacities, sensory systems, and response patterns.

Our ability to learn and remember, our sophisticated skills, our facility with symbolic systems, and our robust self control all mean that the capacity for culture is, in large part, bought with neurological coin. This dynamic infolding of an encultured nervous system happens over developmental time, through the capacity of individuals to internalize both experience and community-generated tools, and then to share thoughts, meanings and accomplishments.”

It is hard to argue with Downey and Lende’s clear, compelling and elegant take on embodied

culture and enculturated brains, but their fluidity in bridging disciplines is not widely evident in the research we reviewed. In fact, in some cases, scholars actively push back against a more expansive understanding of what influences human health, well-being and achievement, and how we can intervene in them to positive ends. Such was the case with one invitee to the Power of Minds conference who declined our invitation, saying, “All of my work focuses on the physical and social environment as it relates to behavior. This is the only approach that has demonstrated effectiveness at the community or population level. In my experience, a focus on internal thought processes as the point of intervention amounts to victim blaming.”

This concern with diminishing one set of explanations or points of intervention by including another appeared again in response to an article by Hatzenbuehler et al. (2013). The original article argues for the recognition of stigma as a fundamental cause of health inequities due to its pervasiveness, disruption of multiple life domains, and impacts on the health of populations. The discrimination that is a core element of stigma acts at a structural level through societal conditions and policies that constrain the opportunities and resources of stigmatized groups, and at the individual level through differences in treatment because of an individual’s membership in a stigmatized group. Stigma also acts within the stigmatized individual, through stress-related mechanisms, the depletion of cognitive resources expended on managing a devalued identity, and maladaptive coping strategies, which can cause or exacerbate a wide range of pathologies.

In an exchange of comments after publication, Lee (2013) suggests that Hatzenbuehler et al. “deflected attention away from the myriad of external factors that might contribute to differences in health outcomes,” and that by focusing on stigma as a fundamental determinant of population health, the authors “place an undue weight of blame on persons from individual population groups for their differences.” Hatzenbuehler et al. respond, “We disagree that identifying determinants of population health inequalities is a zero-sum game. Introducing

stigma as a fundamental cause of population health inequalities does not prevent the field from simultaneously addressing other social causes of poor health." Furthermore, Hatzenbuehler et al. define stigma sociologically, linking it to "macrosocial forces underlying inequality," and therefore claim that they do not "situate the blame for population health inequalities on the shoulders of the stigmatized."

We include this exchange, along with the earlier quote associating a focus on internal thought processes with victim blaming, as anecdotal, but important, evidence of the challenge the research community still faces in linking cultural norms, structural forces, interpersonal interactions, individual experiences, and the impacts of all of these on the body and human well-being. If explanation across these levels remains a challenge, finding ways to intervene across them seems even more daunting. But recent efforts exploring multilevel interventions to increase resilience and well-being are very promising.

Cook et al. (2013) review approaches to reducing the effects of stigma on health that situate interventions within an ecological system with three levels. They write, "the intrapersonal level describes interventions directed at individuals, to either enhance coping strategies of people who belong to stigmatized groups or change attitudes and behaviors of the non-stigmatized. The interpersonal level describes interventions that target dyadic or small group interactions. The structural level describes interventions directed at the social-political environment, such as laws and policies. These intervention levels are related and they reciprocally affect one another...Central to our focus is the idea of bidirectional influences in an ecological system. Through a process of reciprocal causality, interventions can become self-reinforcing if improvement in one outcome improves others, which reinforces the original outcome in an ongoing feedback cycle. This process could unfold both within and between system levels."

Cook et al. review more than 50 interventions or types of intervention to reduce stigma at each of the three levels they identify, and across levels. Intrapersonal interventions include education and

counseling, expressive writing, interventions that increase a sense of belonging, values affirmation for stigmatized people, and for people who are not stigmatized, interventions that highlight cognitive dissonance between their core values and stigmatizing views they might hold about other groups. Interpersonal approaches include interventions that increase trust between individuals (like students and teachers) and those that increase high quality intergroup contact. Structural interventions include communicating diversity values, legal/policy interventions, and advertising, educational and mass media campaigns.

The review of studies undertaken by Cook et al. is valuable in its own right, but we included the paper here because of its theoretical approach and call to action for the research community. The authors write, "Stigma researchers increasingly recognize the value of multilevel, ecological approaches, but they have largely overlooked the idea that ecological systems are dynamic and characterized by bidirectional influences within and between levels...The idea that interventions to reduce stigma at the structural level can affect interpersonal and intrapersonal outcomes is straightforward...Less obvious is the idea that interventions at lower levels can have wide ranging multilevel impact...Indeed, it is commonly assumed, with little evidence to support this, that intrapersonal interventions are ineffective in the presence of unfavorable structural conditions. However, at least in democratic societies, social structures themselves are, in part, a reflection of the individual members of society. For instance, research on same-sex marriage in the United States suggests public opinion affects legislation more than the reverse. As American society has adopted more positive attitudes toward homosexuality, laws allowing same-sex marriage have followed. This suggests that lower-level interventions may sometimes be effective at changing inhospitable social structures."

While Cook et al. focus on surveying interventions across levels, Zimmerman (2017) calls for approaches to strengthening resilience in at-risk youth that are multilevel and integrated by design. He cites a study by Li et al. (2017) that describes a multilevel approach to increasing resilience in AIDS

orphans or children with one or both parents living with HIV/AIDS in China. Li et al.'s Child-Caregiver-Advocacy Resilience intervention (ChildCARE) delivered integrated, but time-lagged, programs for children, caregivers, and the community. They recruited 790 children from rural central China, and assigned each child and one of his/her primary caregivers (as a dyad) to one of four interventions: child-only intervention, child + caregiver intervention, child + caregiver + community intervention, or control. The child intervention consisted of 20 hours of interactive programming that focused on positive thinking, emotional regulation, coping and problem solving. Caregivers received 10 hours of programming to increase positive parenting skills and help parents engage in self-care and seek support. The community-level intervention included monthly home visits by trained community advocates and a series of community-based activities to increase community support for affected families. The researchers found improvements in resilience-related outcomes including coping, hopefulness, emotional regulation, and self-control in all the interventions, but these improvements were smaller and faded over time in the child-only intervention group. Zimmerman noted several limitations in Li et al.'s study, but was clearly excited by the potential power of the multilevel approach. He concludes, "As we move toward an increasingly multilevel understanding of health-related behaviors and attempting intervention, we hope that measurement, model-building and data collection will increasingly be at multiple levels as well as including variables from one level as potential

moderators of effects at others."

While research can play an important role in linking understanding and intervention across levels, change can – and should – also come from within, or in tight collaboration with, communities. Power of Minds participant Lourdes Rodriguez talked about her participation in the CLIMB (City Life is Moving Bodies) project, which aimed to "enhance the physical, social and economic health of northern Manhattan neighborhoods by re-integrating its parks and public spaces adjacent to them into daily life." CLIMB, as described in the CLIMB Chronicles, was fundamentally a community program with shared leadership and open participation that allowed its "interventions" to emerge from group consensus and be shaped by the resources that community groups and members had to contribute. Considered through the lens of multilevel interventions, CLIMB and its activities, including the annual "Hike the Heights" walk, likely intervened at multiple levels, by increasing a sense of belonging among community members, inviting community members to engage in increased physical activity, encouraging interactions between health and community services providers and community members, and making shared spaces more attractive and accessible while increasing the sense of community "ownership" over them. This kind of integrated community activity is much harder to break down into component parts and isolate, but it may be just the kind of intervention that could create longer term, recursive and self-sustaining effects.

WISE INTERVENTIONS

Walton GM (2014). The new science of wise interventions. *Current Directions in Psychological Science* 23(1): 73-82.

Walton GM & Wilson TD (2018). Wise interventions: Psychological remedies for social and personal problems. Manuscript under review; accessed online 01/30/18 at rcgd.isr.umich.edu/seminars/Winter2017/WaltonWilsonUnderReview.pdf.

Cohen, GL, Garcia, J, Purdie-Vaughns, V, Apfel, N & Brzustoski P (2009). Recursive processes in self-affirmation: Intervening to close the minority achievement gap. *Science* 324 (5925): 400-03.

Walton GM & Cohen GL (2011). A brief social-belonging intervention improves academic and health outcomes of minority students. *Science* 331(6023): 1447-51.

Bugental DB., Ellerson PC, Lin EK, Rainey B, Kokotovic A & O'Hara N. (2002). A cognitive approach to child abuse prevention. *Journal of Family Psychology* 16: 243–258.

Okonofua JA, Paunesku D & Walton GM (2016). Brief intervention to encourage empathic discipline cuts suspension rates in half among adolescents. *Proceedings of the National Academy of Sciences* 113(19): 5221-26.

Blackwell LS, Trzesniewski KH & Dweck CS (2007). Implicit Theories of Intelligence Predict Achievement Across an Adolescent Transition: A Longitudinal Study and an Intervention. *Child Development* 78(1): 246-63.

Orosz, G, Péter-Szarka S, Böthe B, Tóth-Király I & Berger R (2017). How not to do a mindset intervention: Learning from a mindset Intervention among students with good grades. *Frontiers in Psychology* 8: 311.

Over the last 10-15 years, there has been an explosion of research in psychology and education on interventions that almost seem magical in their simplicity and effectiveness. Stanford psychologist Greg Walton calls them “wise interventions,” a term adapted from its use to describe straight people in the 1950s who understood gay people’s “full humanity” in a homophobic culture. The term was also later adapted by social psychologist Claude Steele to refer to being “wise” to the worldviews and lived experiences of diverse students in educational settings.

Walton writes that wise interventions are “psychologically precise, often brief, and often aim to alter self-reinforcing processes that unfold over time and, thus, to improve people’s outcomes in diverse circumstances and long into the future. By changing the self over time, many wise interventions go beyond simple “nudges” – changes to a specific situation or decision framework to encourage better behavior in that context (Thaler & Sunstein, 2008).” Walton and co-author Wilson add: “Wise interventions do not address a lack of capacity. Instead, they assume that among many people and in many situations there is often already significant room for improvement – that people are capable and situations afford opportunities, yet people fail

to take full advantage of these opportunities.” Wise interventions are effective because they help people in meaning-making; they change people’s sense of who they are, where they belong, what matters, and why things happen. Those changes, in turn, can influence a variety of choices and behaviors.

Walton (2014) and Walton & Wilson (under review, 2018) are both excellent reviews of the theory behind wise interventions, and they feature numerous examples of striking wise interventions, including:

Cohen et al. (2009): More than 400 African-American and European-American middle school students were given a writing intervention. Half were randomly assigned to write about a neutral topic (control group), and half were asked to reflect on and write about something they personally valued (e.g., relationships with family or friends, or musical interests), through a series of brief, structured writing assignments (self-affirmation group). These kinds of self-affirmations have been shown in other studies to reduce psychological threat and stress. The researchers predicted that the self-affirmations would help African-American students more than European-American students because the former live with greater psychological threat and stress. The results

supported their hypotheses: Over 2 years, the GPAs of African-American students who received the intervention went up by 0.24 points, and low-achieving African-American students benefitted even more, with an increase in GPA of 0.41 points and a drop in remediation or grade repetition from 18% to 5%. African-American students also showed improved self-assessments on their ability to fit in and succeed in school. European-American students showed no significant benefit.

The authors emphasize the “recursive” nature of the values-affirmation intervention, putting it in the context of breaking a critical feedback loop that seemed to have the biggest effect on minority students who had early poor performance, and who, in the control group, generally continued on a downward trajectory. These feedback loop effects – or the process of breaking feedback loop effects – seem to be a common feature of any successful wise intervention.

The concept of belonging is also a prominent feature in effective wise interventions. In a randomized control design, Walton and Cohen (2011) used an intervention to increase the sense of belonging at college among African-American ($n=49$) and European-American students ($n=43$). As in the previous study, the authors hypothesized that African-American students would have more to gain from an increased sense of belonging. First-year students were presented a narrative that described challenges in adapting to the college environment as common, transient parts of an adjustment process that have nothing to do with race or ethnicity. Subjects read ostensible survey results from senior students at their college making the same point, and then wrote essays about how their own experiences echoed the findings of the survey. They then delivered their essay as a speech to a video camera, which they were told would later be shown to young students.

The researchers tracked the impact of this early intervention over the next year, with impressive results. The belonging intervention “closed the minority gap in 3-year GPA ($SD = 0.36$) from 0.29 points in

the control condition to 0.14 points in the treatment condition, a 52% reduction.” The intervention also reduced the number of doctor’s visits made by African-American students, and increased their self-reported health and well-being. Interestingly, surveys done in the senior year with students who received the intervention showed that those students had no awareness of the intervention’s impacts. A follow-up study after graduation showed that African-American adults who had received the intervention 7-9 years earlier had greater life and career satisfaction than their randomized control group colleagues.

So how does a one-time intervention produce dramatic improvements in academic achievement over the next 3-9 years? In his comments at the Power of Minds conference, Walton suggested that the intervention changed African-American students’ sense of belonging, and that this shift empowered them to form stronger relationships with mentors and friends. As those relationships strengthened, presumably the sense of belonging increased as well, leading to a virtuous cycle of positive mindset and behaviors.

In Bugental et al. (2002), shifting meaning-making was also at the center of a novel intervention. Ninety-six families considered high-risk for child maltreatment were assigned to one of three groups: (1) a control group, (2) a group that received an informational home visit modeled after the federal government’s Healthy Start program, or (3) a group that received a home visit that featured purposeful cognitive reappraisal to help parents alter the way they understood difficulties they would face as caregivers, and help them develop better coping skills. Noting that parents who hold “hostile or blame-oriented beliefs about children are more likely to mistreat them,” the researchers trained home visitation staff to talk with parents about recent caregiving difficulties, and then to ask parents about the causes of those difficulties until the parent(s) could generate explanations that did not place blame on the child or children. Blame-free beliefs were then affirmed by the visitor. This approach gently guided parents to shift their narratives from, for example, a

theory about an inconsolable infant being “mad” at the mother because the mother was a “bad parent,” to a blame-free explanation for crying that focused on a possible problem with formula, the latter of which might have tangible solutions.

After an average of 17 visits over the course of a year, the results of the intervention were impressive. “Prevalence of physical abuse (percentage of mothers who were abusive) during the first year was 26% in the control condition, 23% in the unenhanced home visitation condition, and 4% in the enhanced home visitation condition. Benefits were greatest in families that included a medically at-risk child.”

One thing that stands out as being potentially important in this study is the self-generated nature of the shift in meaning-making. Home visitation staff certainly played important roles in *affirming* the “right” kinds of causal attributions, but they relied on parents’ own knowledge, beliefs, and cognitive processes to get there in the first place. By helping shift conversations from explanations to problem-solving and action, the visitation staff also helped start potentially self-recursive processes.

Okonofua et al. (2016) had similar aims in crafting their intervention: to shift teacher mindsets about why students misbehave with the goal of reducing severe disciplinary action. Rather than pursuing new disciplinary policies, teaching teachers new skills, or focusing on building students’ social-emotional capacities, the researchers assumed that teachers already had the skills and experience to translate a more empathic mindset (to be cultivated in the intervention) into a host of decisions and behaviors that could have long-term effects on student behavior and disciplinary actions.

Thirty-one teachers at five schools and 1,682 of their middle-school students participated in this intervention, which took the form of a pair of brief online training modules (45 minutes and 25 minutes). Teachers in the intervention group read a brief article about non-pejorative reasons why students misbehave, and how relationships with teachers can

be a positive force in student development. The materials “discouraged the labeling of misbehaving students as troublemakers” and “encouraged teachers to understand and value students’ experiences and the negative feelings that can cause misbehavior and to sustain positive relationships when students misbehave.” Teachers then wrote about how they could incorporate these ideas into their own classrooms, and were told that their writing would be shared with future teachers who could benefit from their experience. The second module reinforced earlier messages, and asked teachers to think about how they show their students respect. Teachers in the control group experienced a similarly structured set of training modules, but theirs focused on how to use technology to promote learning.

This intervention halved suspension rates over the next year among the teachers who received it and their students, compared to the control. Interestingly, there is also evidence that the reduction of suspensions extended beyond the classrooms of teachers who took part in the intervention. The authors suggest that improved relationships with one teacher (as assessed by student reports, and suggested by teacher comments) might have improved student behavior in other classrooms in the school. This study takes recursiveness to the next level, showing how positive feedback cycles may be able to amplify the impact of a smaller scale intervention over time and space.

A final pair of studies concerns the most famous of the wise interventions: growth mindset. For more than 20 years, Stanford psychologist Carol Dweck and her colleagues have explored the role of a “fixed” versus “growth” mindset in influencing well-being and achievement. Blackwell et al. write that some students “believe that intelligence is more of an unchangeable, fixed ‘entity’ (fixed mindset) and others think of intelligence as a malleable quality that can be developed (incremental or growth mindset.)”

In Blackwell et al., 373 students entering four successive seventh grade classes were given a

survey assessing their theories of intelligence, beliefs about effort, and helpless versus master-oriented responses to failures. Students holding beliefs that intelligence is incremental showed improvements in their grades over the next two years, whereas those who believed in fixed mindsets had a flat trajectory. An intervention that taught the basic tenets of growth mindset to 48 of these students showed that, relative to a control group who learned neutral information about the brain, growth-mindset-trained students had increased motivation and steady or improved grades over the following year.

Orosz et al. (2017) aimed for similar results when they tested a growth-mindset intervention with Hungarian high school students who had high grade point averages. They titled their study “How not to do a mindset intervention” because the intervention failed – and they wanted to know why. They started with two known differences in their experimental context. First, their subjects were already performing well in school; most successful growth mindset (and wise) interventions have been done with low-performers or at-risk youth. Second, existing cultural beliefs were different than in US contexts. Hungarians are less likely to agree with statements like “Hard work is likely to pay off in the long run,” and public education is more conservative, controlled, and less supportive of change. While the growth mindset intervention did alter the beliefs of students who received it in the short term, there were no positive changes by the end of the year in mindset, motivation, or grades.

The authors aimed to fulfill seven core elements of successful mindset interventions: psychological precision, targeting specific groups, appropriate tim-

ing, creating recursive processes, embedding in the appropriate context, avoiding persuasive appeals, and framing the training as learning opportunity.

In trying to figure out why their intervention did not work, they focused on the possibility that their high-achieving students may not have experienced enough failure for the intervention to have an effect, since the intervention focuses on reframing failure as a key component of growth and improvement. They also suggested that working with students in the second year of high school rather than the first might have made for sub-optimal timing. Teachers’ beliefs were not assessed, and given the different cultural context, this may have mattered.

We included this study to show that there are limitations and boundaries to wise interventions. But this really only proves Walton’s point in his “The new science of wise interventions” review that these interventions aren’t magical at all – they are informed, precisely-designed interventions that must account for cultural context, interpersonal relationships, and actions that can be driven by altered beliefs to create meaningful change and lasting outcomes.



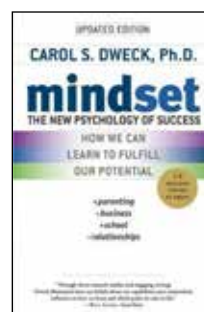
SPIRITUALITY IN THE FLESH: BODILY SOURCES OF RELIGIOUS EXPERIENCES

BY ROBERT C. FULLER, PH.D.
OXFORD UNIVERSITY PRESS, 2008.

Embedded within the Power of Minds project is the question about how our beliefs – including religious ones – can influence our bodies. Robert Fuller, professor of religious studies at Bradley University, flips that question on its head, asking how “religion can be understood in terms of the body’s efforts to reconstitute reality as part of its ongoing adaptation to the environment.” In other words, Fuller sets out to understand how bodily experience shapes our individual – and shared – beliefs as we move through the world. In doing so, he shows a remarkable capacity to connect concepts and theories across scholarly boundaries, especially between constructivist approaches common in the humanities and empirical approaches employed in the sciences.

Fuller’s chapter on pain, healing, and spiritual renewal is especially illuminating. He suggests that pain and illness can prompt the individual in pain to re-make his or her world after the experience of pain “unmakes” it. Observing that pain is inherently subjective, personal and culturally informed, he notes that “some of the most radical impulses in cultural reconstruction are paradoxically rooted in the private experience of the body and its afflictions”. Fuller cites Georgetown theology professor Ariel Glukich’s observation that “the connection between bodily pain and theological constructions exists in ‘that fuzzy area where culture meets biology. This is the place where sensation becomes representation, and conversely consciousness is experienced somatically – in the body... Embodied experience, including pain and its representation, are a mix of biological facts and cultural consciousness (metaphors, emotions, attitudes). The problem...is precisely how this mix works, and how scholarship may combine objective description with subjective experience.’”

This is the mix that Fuller largely gets right in his attempt to better understand spirituality through explorations of the systems of connections and feedback between culture, language, individual perception, bodily experience, and the constant adaptations of these systems to a changing environment. Fuller pushes us beyond our one-way question about how beliefs influence human health, well-being, and achievement into a more complex – and ultimately more satisfying – understanding of the many active interconnections between culture, mind, and body.



MINDSET: THE NEW PSYCHOLOGY OF SUCCESS

BY CAROL S. DWECK, PH.D.
BALLANTINE BOOKS, 2016.

Central to any exploration of the power of minds is the concept of “mindset”: how what we believe about ourselves and others can profoundly affect outcomes. Carol Dweck, a psychology professor at Stanford University, established the term through her pioneering research into the value of adopting and enabling a growth mindset vs. a fixed mindset – in education, athletics, business, and personal relationships. When *Mindset* was first published in 2006, the theory was both embraced and attacked (especially by academics who questioned the universality, rigor, and replicability of her work). But *Mindset*’s intuitive, empowering appeal, Dweck’s thoughtful, public defense of her work, and the growing breadth of research, real-world examples, and successful interventions (many captured in this 2016 edition), have fixed mindset firmly in the social psychology canon (not to mention the Silicon Valley ethos of fail fast and fail often).

The theory is remarkably simple and compelling. People with a fixed mindset believe that one’s capabilities – intellectual, physical, creative – are set in stone; they crave external validation and avoid

taking risks that could undermine their superiority and ego. Those with a growth mindset, on the other hand, seek out and enjoy challenges as opportunities to learn, try new strategies, and improve. Setbacks are motivating, not humiliating. We all harbor both mindsets, of course, but can consciously shift our orientation toward a growth mindset, as well as nurture it in others and in our organizations. This entails encouraging and rewarding effort and ongoing development tied to positive outcomes instead of simply heaping praise on the outcome (“Win!”) or the person (You’re brilliant!”). No more trophies for everyone.

Dweck’s chapter on “Changing Mindsets” describes an intervention that links the development of a growth mindset directly to brain plasticity. In Dweck’s “Brainology” workshops, middle school students are first taught about the human brain and everyone’s ability to continue learning and “get smarter” through challenges, which in turn nourishes the brain. And yes, even old dogs (not just children) can learn new tricks. Dweck also acknowledges that supporting and sustaining a growth mindset is not as easy as it may seem in a culture that still rewards “talent” – the superstar, the genius, the protégé; stresses scores, grades, and credentials; and excuses abusive behavior by people at the top. But there is hope. This book (including the helpful Q&As and exercises) makes clear that that we can each have an impact on ourselves, our families, our schools, and our organizations. Dweck’s foundational work has also set the stage for an explosion of research into how mindsets can significantly change brain chemistry and biology, and vice versa – the true frontier of the Power of Minds.



CLASH!: 8 CULTURAL CONFLICTS THAT MAKE US WHO WE ARE

BY HAZEL ROSE MARKUS, PH.D. AND
ALANA CONNER, PH.D.
HUDSON STREET PRESS, 2013.

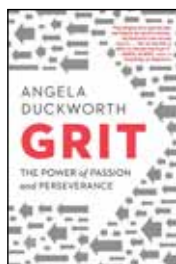
The guiding question for Power of Minds – how does what we think, feel, believe and cognitively practice influence human health, well-being, and

achievement? – addresses many aspects of how we exist as individual selves, but the book *Clash!* adds a layer to this question by also addressing the feelings and beliefs of our cultures and relationships. This added cultural layer which is constantly formed and reformed is an important feature of human health, well-being, and achievement that is often overlooked. *Clash!* explores how culture affects individuals while individuals create culture. It explains that we can be part of many cultures at one time, and that many conflicts that occur between cultures can be boiled down to how independent or interdependent each culture is. Markus and Connor make the case that understanding this is key to bridging the gap between cultures in a multicultural world.

The book examines eight different cultural conflicts using this independent vs. interdependent framework: east and west, gender, race, socioeconomic status, US regions (midwest and south vs. coastal regions), religion, workplace, and northern vs. southern hemispheres. Some groups display features of independent thinking, described as “Individual, Unique, Influencing, Free, and Equal (Yet Great!).” If you are American you most likely use these qualities in your everyday thinking and behaving. But if you were to travel to East Asia you may encounter a different way of being – “Interdependent, Relational, Similar, Adjusting, Rooted, and Ranked.” This side of the world is more focused on relationships between people, and individuals frequently use behavior to accommodate others instead of trying to stand out as a unique individual. In one example, one of the authors tells the story of sitting at a breakfast table with a colleague, who is from Japan. Both she and the colleague have young children. The author started by offering her daughter choices for breakfast and lunch. The author then asked her colleague what he wanted to eat and granted him a similar number of choices. Her overwhelmed colleague asked why she gave her daughter so many choices, and she responded that she wants to raise a daughter who knows what she likes and will grow into a confident and creative adult. Her colleague responded that his daughter, who is given the breakfast that her parents think is best for her, is growing into a trusting person who is learning to pay better attention to those around her. The two researchers had a moment of insight, that

there is no right or wrong way to approach child rearing, but that it is steeped in our cultures.

Another useful takeaway from *Clash!* is that we can be a part of many cultures, and act as many selves depending on our environment. If we can recognize which culture we are currently part of – such as a business meeting in the northeast, or a church in the south – we can use our different cultural selves to optimize our desired outcomes, whether it is a sense of belonging or acting as an agent of change. This is a powerful tool in a world that is becoming more multicultural and connected, in which we have to adapt and collaborate across the globe, or even just across the street.



GRIT: THE POWER OF PASSION AND PERSEVERANCE

BY ANGELA DUCKWORTH, PH.D.
SCRIBNER, 2016.

The overarching question for the Power of Minds is whether or not what we think has an impact on or influences our actual achievements. This same question has clearly crossed the mind of Angela Duckworth, founder and CEO of Character Lab, professor of psychology at the University of Pennsylvania, and author of *Grit: The Power of Passion and Perseverance*. Through her extensive work and research, Duckworth has come to define “grit” as perseverance and passion for long-term goals, and she has developed the Grit Scale, which can predict goal achievement in an individual. The book follows Duckworth’s journey as she investigates how individuals like students at West Point, contestants at the Scripps National Spelling Bee, and athletes like Steve Young use grit techniques to achieve success over time – but also how talent often distracts us from one of the keys to success in most scenarios: effort.

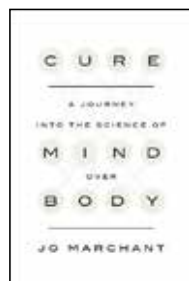
The book includes several chapters that dive deep into the research behind Duckworth’s four Psychological Assets of Grit: Interest, Practice,

Purpose, and Hope. The first, *interest*, is where grit begins. She explains, for example, that it is a good plan to match your chosen profession with activities that capture your interest and imagination as this improves job performance and overall happiness. However, grit comes into play when you foster a passion by sticking with it for some time. It’s when you’re getting elbow deep in the details that the subtleties and exhilarations begin to emerge. The second asset is *practice* – time spent performing a specific task. Duckworth writes that the important aspect to focus on here is not just doing the action itself. To progress and improve, you also need to carry a positive mindset of wanting to be better or to achieve more, thereby fostering a more positive evolution. In addition, practice needs to be deliberate, in which you set stretch goals that help you complete the action until conscious incompetence becomes unconscious competence.

The third asset, *purpose*, deals in matters of the heart. It becomes the so what, and why for experts as it speaks to the worth of all their hard work. The purpose comes from what we do and how it matters to people other than ourselves. The final and most important asset is *hope*. Grit rests on the expectation that our own efforts can improve our future. This has nothing to do with luck and everything to do with resolving to get to a better outcome. You can train your brain to feel helpless about your outcomes, but you can also train your brain for resiliency. Duckworth states, “A fixed mindset about ability leads to pessimistic explanations of adversity and that in turn leads to both giving up on challenges and avoiding them in the first place. In contrast, a growth mindset leads to optimistic ways of explaining adversity and that in turn leads to perseverance and seeking out new challenges that will ultimately make you even stronger.”

In addition to documenting her own journey of perseverance and discovering passion, Duckworth also has taken the time to carefully study the research of others that has laid the foundation for her theories. Duckworth draws from the fields of psychology, cognitive science, neurobiology, human flourishing, and more, and in *Grit* she references the work of such researchers as Scott Barry Kaufman, Anders Ericsson, Duff McDonald, and even Charles

Darwin. *Grit* makes the case that the ability to achieve greatness is within your own grasp through a combination of prolonged interest, a driving purpose, intense effort, and a winning mindset. Duckworth is clear that grit is an asset – an intentional behavior that can and should be learned.



CURE: A JOURNEY INTO THE SCIENCE OF MIND OVER BODY

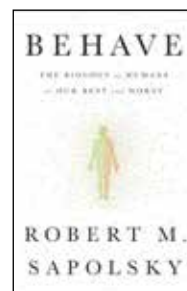
BY JO MARCHANT, PH.D.
BROADWAY BOOKS, 2017.

The primary concern of Jo Marchant in her book *Cure: A Journey into the Science of Mind Over Body* is quite simply the power of minds. The book is a wide-ranging investigation into the profound and yet often mysterious and misunderstood relationship between the human brain and the body. Primarily composed of examples of cutting-edge science and research into the brain and its deep relationship to human health and happiness, *Cure* is also brought to life by anecdotes from patients and individuals that illustrate both an awakening understanding and appreciation of what we know – and perhaps more importantly what we don't – about this emergent field. Marchant holds a Ph.D. in genetics and medical microbiology, and she approaches the book with both an open mind and a sharp eye for evidence-based science.

In the first half of the book, Marchant primarily explores the power of the placebo effect, and its inverse, the nocebo effect. She demonstrates the extent of its incredible power through several striking examples, including a story of "placebo back surgery," in which doctors performed a fake operation on patients to test the effectiveness of an existing procedure. They were shocked to find that the placebo surgery had an equally positive outcome as the traditional invasive surgery. Surprisingly, the placebo effect remains effective even when a patient is aware that they are taking a placebo; Marchant writes that this has led to an entire cottage industry of placebo producers who sell placebos as placebos to willing patients, including pills made of nitro-

gen, oxygen, argon, and carbon dioxide – quite literally air. The second half of *Cure* explores some of the ways that we are beginning to use our deepening understanding of the placebo effect and the power of the mind to help alleviate human suffering and fight disease. Marchant presents an example of doctors using virtual reality to help burn victims through excruciating treatments without the usual high volume of pain medication. She also includes a story of how transcendental meditation is helping people who suffer from irritable bowel syndrome to live a new life after years of unsuccessful medicinal interventions.

We are just beginning to harness the power of placebo, mindfulness, and positive thinking, and in *Cure*, Jo Marchant presents an optimistic view of the possibilities for improving human health and happiness. The effects of the mind on the body are real, concrete, and powerful – and studies demonstrate there are non-chemical and non-invasive interventions that support healthy brain functions which have positive downstream effects on our bodies. *Cure* makes a case for the importance of further serious scientific study into this remarkable relationship.



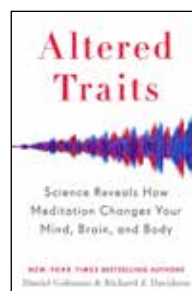
BEHAVE: THE BIOLOGY OF HUMANS AT OUR BEST AND WORST

BY ROBERT SAPOLSKY, PH.D.
PENGUIN PRESS, 2017.

Robert Sapolsky's *Behave* is an expansive attempt to offer the most up-to-date science on all that we know regarding the inner workings and external controls governing our behavior as humans. Whether it's acts of heroism, atrocity, compassion, cruelty, or mundane nothingness, his driving question is simple: "Why do we do what we do?" The answers he offers are compelling, cross-disciplinary, and almost always ambiguous. Sapolsky is clear from the outset that there is no grand theory to explain all of human behavior, and almost every scientific finding comes

with caveats, counter-examples, and limitations. It is for this reason that he emphasizes the role of environment and context over and over. *Behave* lays a lot of groundwork for what we currently understand about the boundary between thoughts, feelings, beliefs, and actual outcomes in the physical world. Throughout *Behave*, Sapolsky entertainingly presents seminal experiments alongside case studies. Chapters are organized from the granular to the global, from the millisecond to the geologic. The shorter the time considered, the more miniscule the biology (and vice versa). The chapter entitled “One Second Before” offers an overview of the brain with key neural processes; the chapter on adolescence tackles the interaction of hormones and brain development; the chapter entitled “Centuries to Millennia Before” explores how culture, co-evolution, and ecology drive behavior. As the book proceeds, the chapters increasingly turn toward the political and sociobiological, complete with an understanding of in-group/out-group dynamics, authority, and our capacity for cooperation. Towards the end of *Behave*, philosophical questions take center stage. His ideas regarding free will are especially useful for helping us discern the true power of minds (or lack thereof), and his chapter on “War And Peace” leads the reader into a state of surprising optimism.

While *Behave* is ambitious in scope, Sapolsky approaches this grand topic with humility. He makes an analogy with archaeology: On every archaeological dig, the scientists will be sure to leave at least some sections completely undisturbed because they know that future archaeologists will develop more sophisticated techniques for interpreting excavations. With regard to human behavior, Sapolsky is persuaded that there are many breakthroughs still to come, and that we should not be disillusioned by the ambiguity surrounding the current state of knowledge. What is most on point with regards to Power of Minds is that the long history of our species tells a story of increasing power. If the core issue of Power of Minds is to discover possibilities and limitations of the mind, Sapolsky’s *Behave* is perhaps the greatest summary of where that frontier stands today.



ALTERED TRAITS: SCIENCE REVEALS HOW MEDITATION CHANGES YOUR MIND, BRAIN AND BODY

BY DANIEL GOLEMAN AND RICHARD J. DAVIDSON, AVERY, 2017.

This book is an accessible must-read for anyone interested in the Power of Minds. It aims to provide scientific confirmation of “altered traits:” new characteristics that arise from a meditation practice and endure apart from the meditation itself, influencing how we behave and flourish in daily life. The authors start by placing meditation and contemplative practices in a historical and global context and explain their belief systems, principles, and intersections. They trace the evolution of meditation, especially in the U.S., from its counterculture associations to a scientifically supported practice (due, in part, to brain imaging technology) that can positively affect our mental and physical health. The book also narrates the personal and professional journeys of the authors – pioneers, friends, and collaborators – as they navigate a skeptical, often antagonistic, academic community while pursuing their own contemplative paths.

Although strong proponents of meditation as a mechanism for unleashing human potential, Goleman and Davidson systematically tackle misperceptions and neuromythology and clarify why so many studies and claims fail to meet rigorous scientific standards. (For example, of the 231 experiments on loving-kindness and compassion that they initially identified as well-designed, only eight ultimately merited inclusion in the book).

Meditation, the authors demonstrate with multiple studies, transforms four neural pathways, producing at least short-term effects:

»Those involved in reacting to distressing events (stress and its recovery) by dampening amygdala activity;

- »Compassion and empathy activated by increased amygdala activity;
- »Circuitry for attention – increased vigilance, focus, and working memory;
- »Our sense of self, in which the brain's default mode (activated prefrontal areas) slows, reducing rumination and, in some, enabling "flow."

In combination these effects can produce a healthier body and mind, with benefits that accrue from minutes of daily practice and increase with lengthier practice (Chapters 4-8). At the extreme, meditation can fundamentally alter traits like selflessness, equanimity, a loving presence, and impartial compassion (Chapters 11-13). The authors also examine promising evidence that meditation may help treat illness, notably by reducing inflammation (Chapter 9-Mind, Body and Genome), and reducing depression, anxiety, pain, and PTSD (Chapter 10-Meditation as Psychotherapy).

Importantly, the authors provide substantial evidence to support the efficacy of increasingly popular interventions that build on meditation, such as Cognitively Based Compassion Training (CBCT), Mindfulness Based Stress Reduction (MBSR), and Mindfulness Based Compassion Training (MBCT). They mention (but provide little data on) promising mindfulness programs for children, including the Kindness Curriculum for preschoolers and the broader Social/Emotional Learning (SEL) curricula for school-age students. And while they applaud the potential reach of digital platforms and apps such as Davidson's "Healthy Minds" and Dimidjian's "Mindful Mood Balance," a web-based course to treat depression, they urge users to again be wary of spurious science and claims.

Perhaps the most fascinating chapters (11-12) of the book describe the transformative impact of meditation on yogis, ranging from those with 12,000 hours of practice to Mingyur Rinpoche, a Tibetan yogi with 62,000 hours. While the N may be small, the lab results are staggering: an 800% increase in the brain circuits involved in empathy; significant drops in brain aging (e.g., from 42

years to 33); sustained "high amplitude" gamma oscillations, in which differing brain regions fire in harmony at rates 25 times greater than the control group; preparedness to act on feelings of empathy and compassion, and much more. Something is going on!

Few of us will ever be yogis. But it's possible to come away from *Altered Traits* persuaded that even a little bit of meditation can go a very long way: 10-15 minutes a day seems like a small (and pleasurable) price to pay for a shot at better health and well being.



ENDURE

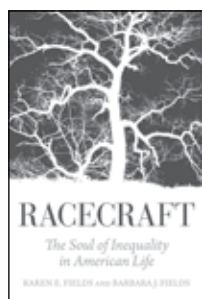
BY ALEX HUTCHINSON
HARPERCOLLINS, 2018.

One of the best ways for us to understand a concept as complex as the Power of Minds is to hone in on specific human quality that is both clearly rooted in the mind but also has obvious physical manifestations. To that end, the idea of endurance provides an excellent focal point. Alex Hutchinson's recent book, *Endure*, explores the science of endurance, specifically as it relates to athletic performance. Hutchinson spend the majority of the book explaining how our understanding of endurance applies to long-distance running, with the occasional mention of other sports such as biking and mountaineering. While the focus on athletic performance may feel somewhat narrow (one can't help but wonder what we'd learn with a broader investigation outside of a competitive sports setting), the science of endurance offers a conceptual framework for understanding both the limitations and the possibilities as it relates to power of minds.

Perhaps it's obvious, but, as Hutchinson describes, endurance is a tougher concept to pin down than we might think. Our measurements cannot be tied to any single physiological variable

(e.g., heart rate, blood oxygen, lung capacity, etc). So, whether it's running, biking, or any other activity, what neurological factors account for the mounting desire to stop or slow down when another part of us wants to keep going? At first glance it might seem like a question of pain tolerance, but studies that examine endurance in conjunction with pain suppression show ambiguous results. Similarly, measurements such as blood oxygen, heat regulation, hydration, and caloric intake do not explain variation in athletic performance. As a result, much of the book addresses the mental, psychological and cognitive processes, for which our metrics are much less explicit.

When taken to the extreme – which, after all, is what performance athletes do – probing the limits of endurance is akin to flirting with mortality. Hutchinson makes an interesting observation when he notes that most of the time athletes do not die while practicing their sport (though they might push themselves to the brink). Something, somewhere in the mind prohibits even the most competitive performers from pushing past a point of no return. And on the flipside of this (possibly morbid) way of looking at things, are stories of athletes who perform above their perceived capabilities and surprise even themselves. While *Endure* is a fun read and presents a comprehensive survey of intriguing studies, much of the current work is nevertheless anecdotal. However, the past century of athletics has been one of increasingly impressive athletic accomplishments, and therefore high performance athletes will likely provide unique insights into the limits of mind-body interactions.



RACECRAFT: THE SOUL OF INEQUALITY IN AMERICAN LIFE

BY KAREN E. FIELDS AND BARBARA J. FIELDS. VERSO, 2014.

Fields and Fields begin *Racecraft* by laying out a few foundational definitions. "Race" is the concep-

tion that nature produced humankind in distinct groups, and that each group is defined by inborn characteristics. "Racism" is the theory and practice of applying a social or legal double standard based on ancestry ("race"). But the main subject of their book – "racecraft" – is a phenomenon that may be slippery for readers who have been steeped in it, including all Americans. Racecraft refers to the "mental terrain and to pervasive belief" that "race" is real. Fields and Fields draw a parallel between their proposed term and witchcraft of the European Middle Ages. In both instances, witchcraft and racecraft are "imagined, acted upon, and re-imagined, and the action and imagining inextricably intertwined." Fields and Fields write: "Far from denying the rationality of those who have accepted either as truth about the world, we assume it. We are interested in the processes of reasoning that manage to make both plausible."

Their book is a tour of the history of race, racism, and racecraft in America, from slavery to the present day, as well as an examination of the lenses through which historians today attempt to understand that history. Fields and Fields lay a compelling case for racecraft as a real phenomenon, but their book is, in a way, adjacent to the main thrust of *Power of Minds* – they do not study nor directly address how health is affected by the ways in which society creates double standards based on ancestry; rather their approach is sociological, historical, and cultural. Nevertheless, Fields and Fields do draw a link between racism and class inequality in the United States, which have always been part of the same phenomenon back to the days of slavery. While race is a socially constructed ideology rather than biologically-based fact, inasmuch as our race identity and class identity influence our health, well-being, and achievement, Fields and Fields begin laying the foundation for the case that we should include both elements in any comprehensive attempt to study the *Power of Minds*.



Where do we go from here? When we first conceived the Power of Minds project, we didn't quite know what to expect. Would scholars from multiple disciplines be willing to share their ideas and insights on such an ambiguous topic? Would they come to Stanford to explore how their research might connect with that of scholars in very different fields? Would the survey of scholarship and the convening itself indicate that the Power of Minds merited further conversation and research?

Happily, the answer to all of these questions turned out to be yes. As Stanford co-host Alia Crum said in her closing comments, "We're on to something here." So where do we go next? Several key themes resonated across our interviews, scholarship survey, and conference conversations.

Continuing the interdisciplinary conversation... and pursuing theories and common language:

Many of the scholars we invited to the Power of Minds conference, including several who couldn't come, implored us to create additional opportunities for conversation among a diverse group of researchers. From the start, we deliberately sought out people from disciplines that rarely interact, and we felt especially lucky to be joined at Stanford by participants who were so open and willing to share ideas without first settling on a common set of terms, concepts, definitions and theories. To continue the conversation fruitfully, however, we do need to socialize helpful theoretical approaches to understanding the Power of Minds (see, for example, Nancey Murphy's presentation on complex adaptive systems, or Greg Downey and Daniel Lende's statement for *The Encultured Brain*), and to clarify discipline-specific definitions, assumptions, and framings wherever possible.

Multi-level mindsets: Some of our richest conversation and questions centered on levels of explanation. How do we understand a complex phenomenon, like stigma, in ways that acknowledge and integrate societal, community, interpersonal, psychological, and physiological explanations of its effects, and that can guide the design of effective

interventions? This challenge isn't about checking all the boxes; there is real concern among scholars about misplacing explanatory power in ways that might diminish other levels of explanation, and misattribute responsibility, especially among disenfranchised or marginalized groups.

More and better research: Many domains of research we surveyed for the Power of Minds are populated by small studies featuring poorly defined interventions and the opportunistic use of existing data sets or scales that may not be the best measures of the variables in question. We heard a number of suggestions about ways to improve the quality, replicability, and utility of research across Power of Minds domains, including:

- » More precise descriptions of interventions, including who delivered them, with what training, in which contexts, with what instruction and explanation, and with what expected practice time
- » More pre-registration of experiments and open sharing of data
- » Hypotheses stated clearly in advance, rather than looking post-hoc for significant effects among a selection of variables
- » A willingness to publish and discuss negative trials
- » Better control group design that accounts for multiple factors that could contribute to significant effects, such as social interaction, generalized stress reduction, personal characteristics of people delivering an intervention, experienced empathy, the roles of information and expectation, etc.
- » More research that identifies boundary conditions in mindset intervention efficacy, and more attention to understanding what underlies heterogeneity in intervention effects across individuals and populations

FINAL THOUGHTS

»Multi-site trials between collaborators that essentially test for replication during the course of the initial experiment, and control to some extent for influences of specific context, populations, geography, and individual researchers

»Identification of new relevant data sets, including some that could come from social media, and collaborative design of large data collection projects with input from researchers in multiple disciplines

»More multi-level research that combines interventions at the intrapersonal, interpersonal, and community or societal levels

»A greater willingness among academics to learn from practitioners and community organizers about *their* informed intervention designs, and to collaborate with them to study ongoing successful interventions as well as co-design future ones

New roles for scholars in “vetting” research and applications: Scholars could play important roles in vetting research, applications, and especially the claims made by companies, popular writers, and other organizations interested in selling mindset interventions and insights to public and professional audiences. Academic researchers have neither the time nor skills and interest to do all of the work of translating new knowledge and interventions for use in the world. Practitioners – teachers, doctors, coaches, therapists, public health workers, and spiritual leaders – probably know their audiences and their needs better anyway. But academics *could* help practitioners and the broader public sort through which ideas and interventions are grounded in solid research, and which aren’t. There are some precedents for this; for example, the public conversation on brain training programs shifted after publication of commentaries by prominent psychologists and neuroscientists. *How to effectively vet and communicate with the public is still an open question, but the need is clear.*

Tools for translation, and improved academic-community partnerships: Several of our interviewees expressed frustration about their research being translated for use in the world by people who didn’t really understand it well, and who lost or abandoned important elements that threatened to undermine its effectiveness. We also heard stories from several conference participants, including Anissa Vines, Neha John-Henderson, Larry Wallack, and Lourdes Rodriguez, about academic researchers imposing interventions and research studies on communities without first assessing their needs and desires, and without collaborating on the structure of interventions and data collection. Clearly, better tools and processes for translating hypotheses into community-based experiments – and for translating findings into tools for use by public and professional audiences – are sorely needed. We can imagine convening researchers and community groups who have effectively worked together to develop toolkits for collaborative community research. We can also imagine developing human-centered design approaches to translating interventions proven effective in academic research into programs and tools that can be used by public and professional audiences, and making these approaches (along with case studies and examples) freely available to research teams interested in translational work.

Broadening the Power of Minds conversation: This report, the Power of Minds conference, and the scholar interviews (video and print) are, ideally, the first step in a longer and broader conversation. We started with an academic focus as a way of understanding what “we” know, and benefited enormously from the rich interdisciplinary inquiry. But the “we” needs to be much bigger, including practitioners, designers, science journalists, and public audiences as well as scholars from different geographies and backgrounds. The Power of Minds is about integrating mind, body, and culture to understand and enable our full potential as humans – both individually and collectively. Doing so requires us to engage all the wisdom, experience, and expertise we can find. 🌸





THE EXPERTS YOU'LL MEET

Stanford Hosts



Brie Linkenhoker

Stanford University

Brie Linkenhoker, PhD, is the founding director of Worldview Stanford, an innovative program at Stanford that translates scholarly research into interdisciplinary media, toolkits, and learning experiences for public and professional audiences. After training in neuroscience, she transitioned into strategy consulting with Global Business Network (GBN) and Monitor, where she applied what she had learned about decision making to real world problems faced by companies, national governments, and nonprofits. At GBN, Brie used scenario planning and game theory-based simulations to help her clients explore multiple possible futures. Brie holds a PhD in neuroscience and an MA in international policy studies from Stanford University, and a BA in psychology from Transylvania University. She did her postdoctoral fellowship in neuroeconomics at Baylor College of Medicine.

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Alia Crum

Stanford University

Alia Crum, PhD, is an Assistant Professor of Psychology at Stanford University. Alia's research focuses on how changes in subjective mindsets—the lenses through which information is perceived, organized, and interpreted—can alter objective reality through behavioral, psychological, and physiological mechanisms. Her work is, in part, inspired by research on the placebo effect, a robust demonstration of the ability of the mindset to elicit healing properties in the body. She is interested in understanding how mindsets affect important outcomes outside the realm of medicine, in domains such as exercise, diet, and stress. More specifically, Alia aims to understand how mindsets can be consciously and deliberately changed through intervention to affect physiological and psychological well-beings. To date, her research has won several awards including the NIH New Innovator Award and the Thomas Temple Hoopes Prize, and has been mentioned in media outlets like *Boston Globe*, *Wall Street Journal*, and *New York Times Magazine's* 2007 "Year in Ideas." In addition to her academic research and teaching, Alia has worked as a clinical psychologist for the VA healthcare system and as an organizational trainer and consultant, creating, delivering, and evaluating workshops on mindset change and stress management for organizations including UBS, Colgate Palmolive, and the United States Navy. Alia received her PhD from Yale University and BA from Harvard University.

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THE EXPERTS YOU'LL MEET

**Bill Newsome***Stanford University*

Bill Newsome, PhD, is Professor of Neurobiology and Director of the Stanford Neurosciences Institute, a campus-wide research initiative that catalyzes new interdisciplinary collaborations at the boundaries of neuroscience and a broad array of other disciplines. Bill's research focuses on the neural mechanisms underlying visually based decision making and related issues in cognitive neuroscience. He seeks to understand how higher mammals acquire sensory information about the world, how that information is processed within the brain, and how behavioral responses to that information are organized. Bill was also the co-chair of President Obama's Brain Research through Advancing Innovative Neurotechnologies (BRAIN) Initiative, a collaborative research initiative to map the activity of every neuron in the human brain. He received his PhD in neurobiology from the California Institute of Technology.

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Participating Scholars
**Adam K. Anderson***Cornell University*

Adam Anderson, PhD, is an Associate Professor of Human Development and Human Neuroscience Institute at Cornell University. His expertise is the neuroscience of emotions and how emotions influence, for better or worse, the mind and body. His research combines psychology, neuroscience, and biosensing technologies for health monitoring and enhancement, ranging from using brain data to predict and further treat those who will relapse into depression, to the development of interventions that reshape how the brain represents itself and the body. Dr. Anderson is the recipient of numerous awards, including the American Psychological Association Distinguished Scientific Contributions Early Career Award in cognitive and behavioral neuroscience, and has served as a scientific delegate on the neuroscience of emotional well-being at the *World Economic Forum*.

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**Lauren Atlas***National Center for Complementary and Integrative Health*

Lauren Atlas, PhD, Atlas joined NIH in 2014 as an NCCIH investigator and chief of the Section on Affective Neuroscience and Pain. She also holds a joint appointment with the National Institute on Drug Abuse (NIDA). Her laboratory uses a multi-modal approach to investigate how expectations and learning influence pain and emotion, and how these factors influence clinical outcomes. She received her BA in psychology from The University of Chicago and her PhD in psychology in 2011 from Columbia University, where she studied under the mentorship of Dr. Tor D. Wager. Her doctoral work combined functional magnetic resonance imaging, experimental psychology, and psychopharmacology to examine the mechanisms by which beliefs and expectations influence pain and its modulation. Dr. Atlas' postdoctoral research was conducted in Dr. Elizabeth A. Phelps's laboratory at New York University, where she extended computational models of decision-making



THE EXPERTS YOU'LL MEET

to isolate components of expectancy, and to understand how these components influence physiological and neural markers of aversive learning.

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**Ozlem Ayduk**

University of California, Berkeley

Oz Ayduk, PhD, has been a faculty member at the University of California, Berkeley, Department of Psychology since 2002. Dr. Ayduk's research aims to elucidate affective and cognitive processes that underlie reactivity, as well as regulation, in response to a wide-range of stressors including social rejection, provocation, and negative autobiographical memories. She has been particularly interested in understanding why some people react to such stressors more strongly and less adaptively than others, and identifying emotion regulation strategies that can be used to down-regulate maladaptive reactions to stress. For example, in one line of work, she has focused on the role individual differences in negative relationship schemas play in explaining personal and interpersonal adjustment. In a second line of research, she has been examining psychological distance (e.g., self-distancing, temporal distancing) as a mechanism that distinguishes adaptive from maladaptive forms of self-reflection. In both lines of work, her broader aim is to leverage basic science findings to develop scalable interventions. Dr. Ayduk received her PhD from Columbia University in 1999 in social & personality psychology where she worked with Drs. Walter Mischel and Geraldine Downey.

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**David Becker**

UCSF Osher Center for Integrative Medicine

David Becker, MD, MPH, MA, is a pediatrician who specializes in integrative medicine, behavioral health, and chronic pain conditions. He was a primary care pediatrician at UCSF for 15 years before fully transitioning to integrative medicine and behavioral health at the Osher Center. He introduced pediatric services at the Osher Center in 2008, shortly after completing fellowship training in integrative medicine. Dr. Becker sees children and young adults with a range of chronic and complex medical issues, with a focus on chronic pain. He also does mental health counseling for children and young adults through their mid-twenties, focusing on anxiety, depression, and other behavior concerns, as well as family therapy. Dr. Becker received his medical degree, MPH, and pediatric residency training from the University of North Carolina, Chapel Hill as well as a master's in clinical psychology from the Wright Institute. Dr. Becker also has a background in global humanitarian aid work with several relief organizations, including Doctors Without Borders, and teaches and lectures nationally and internationally on integrative medicine, mental health, chronic pain management, and mind-body strategies.

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THE EXPERTS YOU'LL MEET

**Heather Berlin***Icahn School of Medicine, Mount Sinai*

Heather Berlin, PhD, is a cognitive neuroscientist and Assistant Professor of Psychiatry at the Icahn School of Medicine at Mount Sinai. She practices clinical neuropsychology at New York Presbyterian Hospital/Weill Cornell Medicine in the Department of Neurological Surgery and is a Visiting Scholar at the New York Psychoanalytic Society and Institute. She explores the neural basis of impulsive and compulsive psychiatric and neurological disorders with the aim of developing novel treatments. She is also interested in the brain basis of consciousness, dynamic unconscious processes, and creativity.

Passionate about science communication and promoting women in STEM, Dr. Berlin is a committee member of the National Academy of Sciences' Science and Entertainment Exchange, and *The New York Times* series TimesTalks. She is host of the PBS series "Science Goes to the Movies," and the Discovery Channel series "Superhuman Show-down," and co-wrote and stars in the critically acclaimed off-Broadway and Edinburgh Fringe Festival show, "Off the Top," about the neuroscience of improvisation. Berlin has made numerous media appearances including on the BBC, History Channel, Netflix, NatGeo, StarTalk, and TEDx. She received her PhD from the University of Oxford and MPH from Harvard University.

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**Anthony Burrow***Cornell University*

Anthony Burrow, PhD, is an Associate Professor in the Department of Human Development at Cornell University. A prominent focus in his research involves delineating how a sense of self-direction—or purpose in life—might serve as a psychological resource for those who cultivate it. Specifically, his work tests the utility of purpose as (a) an asset for positive youth development and (b) a source of protection in the face of stress and challenge. Dr. Burrow is also the co-director of PRYDE (the Program for Research on Youth Development and Engagement). The aim of PRYDE is to link science and service in innovative ways by involving 4-H communities in basic and translational research to understand and improve youth experiences. He received a BA in psychology from the University of North Carolina at Chapel Hill, and a PhD in applied developmental psychology from Florida International University. His postdoctoral studies were conducted at the Multicultural Research Institute at the University of Notre Dame.

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**John Campbell***University of California, Berkeley*

John Campbell, DPhil, is the Willis S. and Marion Slusser Professor of Philosophy at the University of California, Berkeley. His main interests are in the theory of meaning, metaphysics, and philosophy of psychology. He is currently working on the question of whether consciousness – and in particular sensory awareness – plays any key role in our knowledge of our surroundings. He is also working more generally on causation in psychology. He is the author of *Past, Space and Self* (1994) and *Reference and Consciousness* (2002). Dr. Campbell received his doctorate in philosophy at the University of Oxford.

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THE EXPERTS YOU'LL MEET

**Alana Conner***Stanford University*

Alana Conner, PhD, is a cultural scientist who studies, writes about, and consults on culture, psychology, and health. As the executive director of Stanford SPARQ: Social Psychological Answers to Real-world Questions, she helps create and share evidence-based solutions to social problems. She also collaborates with clients like The World Bank, Kaiser Permanente, and the Stanford School of Medicine to design interventions that enhance the wellbeing of diverse people around the world. Her writings have appeared in many outlets, including *The New York Times*, *The Huffington Post*, and the *Stanford Social Innovation Review*, where she served as senior editor. With Hazel Rose Markus, she is the coauthor of *Clash! How to Thrive in a Multicultural World*. Dr. Conner received her PhD in psychology from Stanford University and her postdoctoral certificate in psychology and medicine from the University of California, San Francisco.

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(See host bio above)

**Beth Darnall***Stanford University*

Beth Darnall, PhD, is Clinical Professor in the Department of Anesthesiology, Perioperative and Pain Medicine at Stanford University. She is Principal Investigator for \$14 million in national research awards from the Patient Centered Outcomes Research Institute and the National Institutes of Health that investigate innovative and evidence-based behavioral treatment for pain and opioid reduction in chronic pain. Her most recent award is a multi-state pragmatic clinical trial that is investigating behavioral treatments as a pathway to optimize outpatient opioid tapering in chronic pain. She seeks to address patients' primary fears and concerns to best engage them as partners in pain care decision making. Dr. Darnall is also the author of *The Opioid-Free Pain Relief Kit* (2016) and *Less Pain, Fewer Pills: Avoid the dangers of prescription opioids and gain control over chronic pain* (2014), and the forthcoming book from the American Psychological Association entitled *Psychological Treatment for Chronic Pain*. Her work and viewpoint has been featured by multiple media outlets, including the *San Francisco Chronicle*, *New York Magazine*, *MORE*, *Forbes*, *Scientific American*, *The Washington Post* and *Time*.

Bdarnall@stanford.edu**Emmy Ganos***Robert Wood Johnson Foundation*

Emmy Ganos, PhD, joined the Robert Wood Johnson Foundation in 2013. She works on the Foundation's efforts to advance a "Culture of Health," where our economy is less burdened by excessive and unwarranted health care spending, and where the health of the population guides public and private decision making. She brings her research experience in public and community health to her work at RWJF, and relishes the opportunity the Foundation provides to apply her expertise to improving the value of health care and public health. Dr. Ganos



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has held research and teaching positions with the Medical College of Wisconsin in Milwaukee, working with undergraduate, graduate, and medical students. Her dissertation research explored the role of physicians' cultural norms in patterns of health care utilization and cost. Prior to joining the Medical College, Dr. Ganos served as a manager of research and administration with the Donors Forum of Wisconsin, a professional membership association for grantmakers and Wisconsin's premier resource for philanthropy. eganos@rwjf.org

**George H. Grant***Emory University*

George H. Grant, MDiv, PhD, is a psychologist and certified educator appointed by Emory University to lead, teach and research in the area of spirituality and health. He is the Executive Director for Spiritual Health in the Woodruff Health Sciences Center responsible for the clinical consult service to all patients, families and staff employees across the Emory Healthcare system. Over 118,000 spiritual health consults occurred at EHC in FY 2017. Dr. Grant is a national leader in the education of clinicians dedicated to whole person health of patients, and he's also an expert in clinician burnout. He is on faculty with the Nell Hodgson Woodruff School of Nursing and the Candler School of Theology at Emory as well as the University of Washington School of Medicine in Seattle.

ghgrant@emory.edu**MarYam Hamedani***Stanford University*

MarYam Hamedani, PhD, is Senior Research Scientist at the Stanford Center for Social Psychological Answers to Real-world Questions (SPARQ). SPARQ is a "do tank" that partners with practitioners in government, business, education, and nonprofits to craft solutions to our communities' most pressing problems using insights from social psychological research. At SPARQ, Dr. Hamedani studies and puts into practice strategies to help people learn about race, social class, and other forms of difference. She leads projects on reducing racial bias in policing, improving racial literacy, educating people about difference, and fostering inclusive, empowering schools and classrooms. The former associate director of Stanford's Center for Comparative Studies in Race and Ethnicity (CCSRE) and the Stanford Center for Opportunity Policy in Education (SCOPE), her work has been published in leading journals such as *Psychological Science and Personality and Social Psychology Bulletin*, and has been covered by national media outlets such as National Public Radio, ABC News, *The Boston Globe*, *The Atlantic*, and *The Huffington Post*. She received her PhD in psychology from Stanford University.

maryamh@stanford.edu**Mark Hatzenbuehler***Columbia University*

Mark L. Hatzenbuehler, PhD, is an Associate Professor of Sociomedical Sciences and Sociology at Columbia University's Mailman School of Public Health. He completed his doctoral degree in clinical psychology at Yale University and his post-doctoral fellowship at Columbia University, where he was a Robert Wood Johnson Foundation Health & Society Scholar. Dr. Hatzenbuehler's research examines how structural forms of stigma, including social policies and



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community norms, increase risk for adverse health outcomes among members of socially disadvantaged populations, with a particular focus on lesbian, gay, and bisexual individuals. Dr. Hatzenbuehler has published over 100 peer-reviewed articles and book chapters, and his work has been published in several leading journals, including *American Psychologist*, *Psychological Bulletin*, *American Journal of Public Health*, and *JAMA Pediatrics*. His research has been funded by the National Institute of Mental Health, the National Institute on Drug Abuse, the Centers for Disease Control and Prevention, and the Swedish Research Council for Health, Working Life, and Welfare. In recognition of this work, Dr. Hatzenbuehler has received awards from the Society for the Psychological Study of Social Issues, the American Psychological Association, and the Association for Psychological Science. His work has been widely covered in the media, including interviews on NPR and MSNBC, and it has been cited in amicus curiae briefs for cases on status-based discrimination. Dr. Hatzenbuehler currently serves on four editorial boards and also recently served as a member of a consensus committee on peer victimization and bullying at the National Academy of Sciences, Engineering, and Medicine. mlh2101@cumc.columbia.edu

**Rick Hecht**

UCSF Osher Center for Integrative Medicine

Rick Hecht, MD, is Research Director of the Osher Center, Professor of Medicine at UCSF, and Osher Foundation Endowed Chair in Research in Integrative Medicine. He is trained in internal medicine, and received training in clinical research methods during a fellowship in clinical epidemiology at UCSF. Dr. Hecht has built a research program at the UCSF Osher Center that focuses on rigorous testing of the health effects of mind-body interventions, particularly meditation and yoga. His research incorporates a psychoneuroimmunology approach to studying the effects of these practices on the endocrine, metabolic, and immune systems. His research interests include incorporating mindfulness components into lifestyle interventions to improve adherence to healthy diets in obesity and diabetes, and how to measure intervention fidelity and teacher skill in mindfulness interventions. He is the author of over 200 peer-reviewed articles, and has been the principal investigator of multiple NIH grants. He directs the UCSF Training in Research in Integrative Medicine fellowship program, funded by an NIH T32 grant. Mentoring is one of his key commitments, which has included serving as a mentor for 11 successful NIH K-grant junior career development awardees.

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**Neha John-Henderson**

Montana State University

Neha John-Henderson, PhD, joined the psychology department at Montana State University in 2017, where she has developed a research program focused on the ways in which differences in childhood environments shape the way we cope with stress, our social interactions and health behaviors, and how these differences may in turn get under the skin to affect health across the lifespan. She is especially interested in factors that may promote resilience in spite of having faced adversity in life. Dr. John-Henderson earned a bachelor's in sociology and a PhD in psychology at the University of California, Berkeley. She continued to study social disparities in health as a postdoctoral fellow in cardiovascular behavioral medicine at the University of Pittsburgh.

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**Corey Keyes***Emory University*

Corey Keyes, PhD, holds the Winship Distinguished Research Professorship in Sociology at Emory University. His research has introduced the concepts of social well-being, flourishing, the two continua model of mental health and illness, and the race paradox in mental health and illness. He was a member of a MacArthur Foundation Research Network on Successful Midlife Development and also co-chaired—along with Martin Seligman and the CEO of the Gallup Organization—the First Summit of Positive Psychology held in 1999. A founding member of the Society for the Study of Human Development, Dr. Keyes was a member of the National Academies of Science Keck Future's Initiative on The Future of Human Healthspan and the National Academies of Science workshop for the committee on national statistics to redefine recovery from mental illness, and was a contributing author to the World Health Organization's publication "Mental Health Promotion Worldwide." He continues to consult with governments and public health systems around the world and is working to transform the emphasis on treatment of illness to the promotion and protection of positive mental health to prevent mental illness.

ckeyes@emory.edu**Amy Krentzman***University of Minnesota School of Social Work*

Amy R. Krentzman, MSW, PhD, is an Assistant Professor at the School of Social Work and at the Center for Spirituality and Healing at the University of Minnesota and an Adjunct Research Investigator in the Department of Psychiatry at the University of Michigan Medical School. Dr. Krentzman's research focuses on factors that promote the initiation and maintenance of recovery from alcohol and other substance use disorders, particularly the mechanisms of therapeutic change that are precipitated by professional treatment, recovery community organizations, and 12-step programs. Dr. Krentzman studies spirituality, religiousness, gratitude, forgiveness, and practices such as prayer and meditation as they function in the context of addiction recovery.

akrentzm@umn.edu**Kari Leibowitz***Stanford University*

Kari Leibowitz is a PhD candidate and graduate fellow in psychology at Stanford University, working with Professor Alia Crum in the Stanford Mind and Body Lab. Her research investigates how we can better harness psychological and social forces in healthcare to improve patient health outcomes and physician wellness. This work involves developing and implementing a training program to help healthcare providers leverage mindset in the clinic, understanding the power of provider assurance to reduce patient symptoms, studying the effects of non-deceptive placebos, and investigating how to frame side effects to improve treatment outcomes for children undergoing oral immunotherapy for food allergies. She received her BA in psychology and religion from Emory University and then served as the Program Coordinator for the Emory-Tibet Partnership for two years. In this role,



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Ms. Leibowitz organized the 2013 visit of the Dalai Lama to Emory, served as the Program Assistant for the Tibetan Mind/Body Sciences program, and was a Cognitively-Based Compassion Training instructor. From 2014-2015, she lived above the Arctic Circle in Norway, where she researched mindsets about the winter at the University of Tromsø under a U.S.-Norway Fulbright grant.

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**Daniel Lende**

University of South Florida

Daniel Lende, PhD, is an Associate Professor of Anthropology at the University of South Florida. His research focuses on addiction, stress, behavioral health, biocultural approaches, and applied anthropology.

He is co-author of *The Encultured Brain: An Introduction to Neuroanthropology* (MIT Press, 2012), the foundational text in this new field, and co-founder of the Neuroanthropology blog hosted on PLOS Blogs. He has also published in journals such as *American Anthropologist*, *Addiction*, and *Ethos*. He was a Fulbright Scholar as both a professor and graduate student in Colombia, where he has done much of his field work, and has received funding from the National Institutes of Health and the National Science Foundation. He holds a PhD from Emory University and AB from Harvard University.

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Brie Linkenhoker

Stanford University

(See host bio above)

**Hazel Markus**

Stanford University

Hazel Rose Markus, PhD, is the Davis-Brack Professor in the Behavioral Sciences at Stanford University. Her research focuses on the role of self in regulating behavior and on the ways in which the social world shapes the self. Her work examines how cultures, including those of nation or region of origin, gender, social class, race, ethnicity, religion, and occupation, shape thought, feeling, and action. Dr. Markus is currently director of Stanford's Research Center for Comparative Studies in Race and Ethnicity (CCSRE) and co-director of Stanford's center for Social Psychological Answers to Real-world Questions (SPARQ). She is a member of the Successful Societies Advisory Committee, a program of the Canadian Institute For Advanced Research (CIFAR), and is the former President of the Society for Personality and Social Psychology. Dr. Markus is a fellow of the American Academy of Arts and Sciences, a member of National Academy of Sciences and recipient of the American Psychological Association's award for Distinguished Scientific Contribution. She received her BA from California State University at San Diego and her PhD from the University of Michigan.

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**Nancey Murphy***Fuller Theological Seminary*

Nancey Murphy, PhD, Th.D., is Senior Professor of Christian Philosophy at Fuller Theological Seminary in Pasadena, CA. Her research interests focus on the role of modern and postmodern philosophy in shaping Christian theology; on relations between theology and science; and relations among neuroscience, philosophy of mind, and Christian anthropology. Her first book, *Theology in the Age of Scientific Reasoning* (Cornell, 1990) won the American Academy of Religion award for excellence. Dr. Murphy is the author of nine other books including *Bodies and Souls, Or Spirited Bodies?* (Cambridge University, 2006), and *Did My Neurons Make Me Do It? Philosophical and Neurobiological Perspectives on Moral Responsibility and Free Will* (Oxford University, 2007; co-authored with Warren Brown). She received a BA from Creighton University (philosophy and psychology), a PhD from U.C. Berkeley (philosophy of science), and a Th.D. from the Graduate Theological Union (theology).

*nmurphy@fuller.edu***Bill Newsome***Stanford University*

(See host bio above)

**Jason Okonofua***University of California, Berkeley*

Jason Okonofua, PhD, is an assistant professor at the University of California, Berkeley. His research program examines social-psychological processes that contribute to inequality. One context in which he has examined these processes is that of teacher-student relationships and race disparities in disciplinary action. His research emphasizes the ongoing interplay between processes that originate among teachers (how stereotyping can influence discipline) and students (how apprehension to bias can incite misbehavior) to examine causes for disproportionate discipline according to race. By investigating basic processes that contribute to misinterpreted and misguided disrespect among teachers and students, Dr. Okonofua aims to develop novel interventions that help racially stigmatized youth succeed in school and reduce their risk of discipline problems. His research has been published in top journals, including *Psychological Science* and the *Proceedings of the National Academy of Sciences* and it has been featured on a variety of popular media, including *The New York Times*, MSNBC, Reuters, *Huffington Post*, *Daily Mail*, *Wall Street Journal*, and *Education Week*. Dr. Okonofua received a PhD in psychology from Stanford University.

okonofua@berkeley.edu**Chikako Ozawa-de Silva***Emory University*

Chikako Ozawa-de Silva, PhD, is Associate Professor of Anthropology in the Department of Anthropology at Emory University. Her research focuses on cross-cultural understandings of health and illness, especially mental illness and well-being, by bringing together Western and Asian (particularly Japanese and Tibetan) perspectives on the mind-body, religion, medicine, therapy. Her publications include one monograph, *"Psychotherapy and Religion in Japan: The Japanese Introspection Practice of Naikan"* (Routledge, 2006), and numerous peer-re-



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viewed articles on psychotherapeutic practice, suicide, the mind-body relationship and Tibetan medicine. Dr. Ozawa-de Silva's most recent studies include ethnographic studies of the contemplative practices such as CBCT (Cognitively-based Compassion Training) and their applications in prison and domestic violence context. She received a PhD in anthropology from Oxford University.

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Dawid Potgieter

Templeton World Charity Foundation

Dawid Potgieter, DPhil, is a Program and Communications Officer of TWCF. He is involved with developing new grant proposals in a wide range of areas including research in the natural sciences, philosophy, and public outreach activities. Before joining TWCF, Dawid studied biochemistry at The University of Oxford, and stayed on there to complete a D.Phil. in neuroscience at the Department of Physiology, Anatomy, and Genetics.

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Charles Raison

University of Wisconsin-Madison and Emory University

Charles Raison, MD, is the Mary Sue and Mike Shannon Chair for Healthy Minds, Children & Families and Professor, School of Human Ecology, and Professor, Department of Psychiatry, School of Medicine and Public Health, University of Wisconsin-Madison. He is internationally recognized for his studies examining novel mechanisms involved in the development and treatment of major depression and other stress-related emotional and physical conditions, as well as for his work in identifying and examining novel somatic and behavioral treatments for depression and related conditions associated with reduced well-being. He serves in a consultant role as Director of Clinical and Translational Research for Usona Institute, and as Director of Research in Spiritual Health for Emory University Healthcare and as the Founding Director of the Center for Compassion Studies in the College of Social and Behavioral Sciences at the University of Arizona. Dr. Raison received the Raymond Pearl Memorial Award from the Human Biology Association "in recognition of his contributions to our understanding of evolutionary biocultural origins of mental health and illness" and has been recognized as a "Faculty of Excellence" at UW-Madison. Dr. Raison's book *The New Mind-Body Science of Depression* was published by W.W. Norton in 2017.

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Erick Ramirez

Santa Clara University

Erick Ramirez, PhD, is assistant professor of philosophy at Santa Clara University. His research has focused on disentangling empathic capacities from one another and assessing their relevance to moral knowledge and moral agency. One branch of this research examines the potential for VR simulations to supplant thought-experiments for pedagogical and moral research. His most



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current articles analyze ethical issues in VR research and propose new IRB guidelines for the use of VR. Dr. Ramirez has published in journals including the *American Journal for Bioethics: Neuroscience, Philosophical Psychology, Metaphilosophy, and Philosophical Explorations*. He has also contributed chapters to several collections including *Ethics and Neurodiversity* and the *Bloomsbury Companion to the Philosophy of Psychiatry*. He received his PhD from the University of California at San Diego, specializing in moral psychology and the emotions.

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Lourdes Rodriguez

University of Texas, Austin

Lourdes Rodriguez, DrPH, is an Associate Professor and directs the Center for Place-Based Initiatives at Dell Medical School at the University of Texas, Austin. The Center aims to identify persons within Austin/Travis County and Central Texas communities who have ideas to improve the health of their communities and neighborhoods; provide timely and customized support to help implement and test ideas—and to scale those shown to be effective; identify and support exceptional people and ideas that may otherwise not have a source for support, and ensure their community impact and sustainability. She previously taught at Columbia University, where she earned a doctorate in public health.

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Melissa Rosenkranz

University of Wisconsin-Madison

Melissa Rosenkranz, PhD, is an Associate Scientist at the Center for Healthy Minds at the University of Wisconsin-Madison. Her career has focused on the involvement of emotion and affective neural circuitry in health and disease for over 15 years. In particular, she is interested in the neural-immune and biochemical mechanisms by which individual differences in affective responding modulate resilience to and progression of disease. Much of this work has examined the role of affect-related neural circuitry in linking stress and emotion with exacerbations in asthma, using both PET and fMRI. A complementary facet of Dr. Rosenkranz's research examines the impact of meditation training on affective responding as it relates to resilience and vulnerability to chronic disease. Toward this effort, she is currently leading an investigation of the effects of MBSR training on emotion-related neural reactivity, airway inflammation, and disease expression in individuals with asthma. Dr. Rosenkranz received her PhD in psychology from the University of Wisconsin-Madison, where she continues her work with Dr. Richard Davidson.

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Rebecca Seligman

Northwestern University

Rebecca Seligman, PhD, is a medical and psychological anthropologist who focuses on transcultural psychiatry. She is currently an Associate Professor of Anthropology and Global Health, and a Faculty Fellow of the Institute for Policy Research at Northwestern University. Her research interests involve critical examination of the social and political-economic forces that affect the experience and distribution of mental and physical illness, with an emphasis on mind-body processes and physiological mechanisms through which such forces become embodied. Dr. Seligman is interested in how stress, social disadvantage, cultural models of



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selfhood, narrative, and practice shape outcomes such as post-traumatic stress disorder (PTSD), dissociation, depression, somatization, physical illness, and healing/resilience. Seligman's work explores how current neurobiological research and new models of mind, cognition, and embodiment inform understandings of these phenomena. Her past research explored the connection between mental health and religious participation in northeastern Brazil and her book on this research was published in 2014. Her current research explores experiences of depression and anxiety among Mexican American youth, examining how youth conceptualize and experience their emotions, relationships, and sense of self and how these influences shape coping behaviors, therapeutics, and experiences of mental health care. She received a PhD in anthropology from Emory University and completed a CIHR funded postdoctoral fellowship in McGill University's psychiatry department.

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**Yi-Yuan Tang**

Stanford University

Yi-Yuan Tang, PhD, is currently a Presence-CASBS Fellow at the Center for Advanced Study in the Behavioral Sciences, Stanford University.

He is a Presidential Endowed Chair in Neuroscience and Professor of Psychological Sciences and Internal Medicine at Texas Tech University. Dr. Tang studies the neuroscience of attention, engagement, mindfulness, flow, creativity, decision making and body-mind interaction/optimization using psychosocial, physiological, neuroimaging, mental training and genetic analysis. He developed a novel mindfulness based preventive intervention—Integrative Body-Mind Training (IBMT)—and has studied its effects in large randomized clinical trials in healthy and patient populations since 1990s. He has published eight books, such as *Brain-Based Learning and Education: Principles and Practice*, *The Neuroscience of Mindfulness Meditation: How the Body and Mind Work Together to Change Our Behaviour*, and more than 290 peer-reviewed articles; his research has also been featured in the popular press. He is a Fellow of the Association for Psychological Sciences (APS) and American Psychological Association (APA), and associate editor of *Social Cognitive and Affective Neuroscience* (SCAN). He received a PhD in cognitive neuroscience and neuroengineering.

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**Matt Trujillo**

Robert Wood Johnson Foundation

Matthew Trujillo, PhD, joined the Robert Wood Johnson Foundation in 2013 as a research associate with the Foundation's Research-Evaluation-Learning unit. Through his work, he embraces the Foundation's goal of ensuring that its research findings are understandable, effectively communicated, and actionable. Previously, Dr. Trujillo served as an adjunct researcher with the RAND Corporation. He received a BS in psychology from Arizona State University and a PhD in psychology and social policy from the Woodrow Wilson School of Public and International Affairs at Princeton University.

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**Kate Turetsky***Columbia University*

Kate Turetsky is a fifth-year doctoral candidate and National Science Foundation Graduate Research Fellow in psychology at Columbia University working with Valerie Purdie Greenaway. Her research employs social psychological interventions and social network analysis to understand and address real-world problems related to group identity, stigma, and psychological threat. These problems include high dropout rates in the sciences, undertreatment of mental health issues, and prejudice toward minority groups. In addition to her research, she co-founded the first annual national conference on designing, implementing, and evaluating social psychological interventions through the Society for Personality and Social Psychology and directs the Lobel Undergraduate Research Fellowship program in the Psychology Department at Columbia. Ms. Turetsky earned her BA in psychology and studio art from Amherst College and spent the following year as a fellow in a neuropsychology lab at the National Institute of Mental Health.

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**Anissa Vines***University of North Carolina, Chapel Hill*

Anissa Vines, PhD, is an Assistant Professor of Research in epidemiology at the University of North Carolina at Chapel Hill Gillings School of Global Public Health, a research fellow at the Cecil G. Sheps Center for Health Services Research, a member of the NC TraCS Institute, and a member of the Social Epidemiology Program. Dr. Vines is a psychosocial epidemiologist with over 15 years of experience managing health equity research center grants, teaching and publishing on health equity topics, and conducting research to elucidate the role of psychosocial stress and interpersonal racism in increasing disease risk. Dr. Vines has used qualitative and quantitative research methods to develop the Telephone-administered Perceived Racism measure for use in epidemiological studies. Her publication record reflects her research goal to understand the stress experience, especially among African American women, to determine how certain stressors (individually and in combination) along with the coping response contribute to chronic disease disparities. She received her PhD in epidemiology from the University of North Carolina at Chapel Hill.

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**Tor Wager***University of Colorado*

Tor Wager, PhD, is Professor of Psychology, Neuroscience, and Cognitive Science at the University of Colorado, Boulder. Since 2010, he has directed Boulder's Cognitive and Affective Neuroscience laboratory.

Much of the lab's work centers on the neurophysiology of pain and emotion and how they are shaped by cognitive and social influences. Dr. Wager and his lab are also involved in developing analysis methods for functional neuroimaging. He previously served as an Assistant and Associate Professor at Columbia University and received his PhD from the University of Michigan in cognitive psychology.

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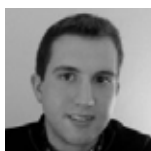
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**Larry Wallack***OHSU-PSU School of Public Health*

Lawrence Wallack, DrPH, is currently a Professor at the Oregon Health & Science University/Portland State University School of Public Health and a Distinguished Fellow of the Moore Institute for Nutrition and Wellness in the OHSU School of Medicine. He is one of the primary architects of media advocacy—an innovative approach to working with mass media to advance social and public health policies. Dr. Wallack's current work focuses on two areas: translating the science of developmental origins of health and disease into public health policy and practice on a community, regional, and statewide level in Oregon; and developing communication-framing strategies to advance social justice based policies to improve the public's health. In 1993 he was the founding director of the Berkeley Media Studies Group, an organization conducting research and training in the use of media to promote healthy public policies. He also served for nine years (2004-13) as Dean of the College of Urban and Public Affairs at Portland State University and is Emeritus Professor of Public Health, University of California, Berkeley. He has published extensively and lectures frequently on the news media and public health policy issues.

wallack@pdx.edu**Greg Walton***Stanford University*

Greg Walton, PhD, is an Associate Professor of Psychology and the Michael Forman University Fellow at Stanford University. Much of his research investigates psychological processes that contribute to major social problems and how "wise" interventions that target these processes can address such problems and help people flourish, even over long periods of time. In all these cases, Dr. Walton focuses on fundamental ways in which people make sense of themselves, other people, and social situations, how meanings people draw can be counterproductive and self-reinforcing (e.g., "People like me don't belong here") and how they can be altered to cause lasting benefits to individuals and to society. Dr. Walton's research has been covered in major media outlets and he has received awards from numerous organizations such as the American Education Research Association, the American Psychological Association, and the American Psychological Society. Dr. Walton earned his AB in philosophy from Stanford, a PhD in psychology from Yale University, and completed a postdoctoral fellowship at the University of Waterloo.

gwalton@stanford.edu**Sean Zion***Stanford University*

Sean Zion is a second-year PhD student in the Department of Psychology at Stanford University. His work investigates the psychosocial factors that influence health and disease. Specifically, he is interested in understanding how patients' mindsets influence chronic illness and shape treatment outcomes. His research draws from both the biomedical and social psychological literature and is largely inspired by the placebo effect.

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Conference Staff

**Alece Birnbach**

The founder of the Graphic Recording Studio, Alece Birnbach brings experience as a fine artist, illustrator and 20 years as an advertising art director to her company. Her background in advertising and client service for large agencies gives her a marketing expertise that matches her skills as a successful commercial illustrator. This unique combination of skills and experience gives Alece the ability to listen differently to what clients need and to capture and organize ideas quickly, always with sustainable outcomes in mind. Alece has created live maps of keynotes, concurrent sessions and panel discussions, board retreats, and vision and planning meetings. She is also a highly skilled digital illustrator and creates beautiful infographics and animated videos that bring clarity to a wide range of concepts. Her work spans from Fortune 500 companies to small nonprofit organizations.
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**Donna Broughan**

Donna is founder of DB Solutions, an event/meeting planning and production company based in the SF Bay Area. She has been in the meeting & event business for over 25 years and working with Worldview Stanford since its inception. Donna has successfully operated hundreds of programs all over the world from small executive board meetings to full blown corporate incentive programs to large (5000+) association meetings. She earned a BA in Geography and a minor in Tourism from California State University at Chico.
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**Alison Fell**

Alison is content producer obsessed with all things social. She has an MFA in Commercial Photography from the Academy of Art University and a BA in Visual Arts, New Media from the UC San Diego. She has spent the past 5 years pursuing her passion for brand awareness, media management, and social engagement. You'll never find her without ear buds, chapstick, or aviator sunglasses. If it's #instaworthy, she's posting about it on @alifellinlove.
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**Nancy R. Murphy**

As Director of Experience Design and Communications at Worldview Stanford, Nancy creates, communicates, and connects scholarly and strategic insights through media and experiences. Prior to helping create Worldview Stanford, she spent 20 years at Global Business Network, the scenario-planning consultancy, as CMO, editor-in chief, and a member of the leadership team. She also headed GBN's membership service, curated its network of 150 "remarkable people," and spearheaded multi-stakeholder projects on the future of climate change, pandemics, and AIDS. Nancy graduated from Wellesley College (political science), received an MS from Arizona State University, and is on the boards of the Wellesley Business Leadership Council and SHE-CAN, a nonprofit that mentors and educates exceptional young women from post-conflict countries.
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Amedeo Tumolillo

Stanford University

Amedeo Tumolillo joined Stanford SPARQ: Social Psychological Answers to Real-world Questions as its media director in September 2017. He is an editor, writer, and multimedia digital producer with nearly two decades of journalism experience. Amadeo has worked at publications that include *The New York Times*, *Spectrum Autism Research News*, *SupChina*, and *The Albuquerque Tribune*.

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The Power of Minds

DECEMBER 5-7, 2017

ONSITE AGENDA

Welcome!

TUESDAY, DECEMBER 5

	BECHTEL CONFERENCE CENTER, ENCINA HALL
8:30 AM	Continental breakfast
9:00 AM	Welcome and Introductions
9:45 AM	>Culture-Mind-Body: A Scientific Introduction Brief presentations and Q&A with Alia Crum (Stanford), Tor Wager (Colorado), Mark Hatzenbuehler (Columbia)
11:15 AM	Break
11:30 AM	>Human Flourishing Conversation with Corey Keyes (Emory), Heather Berlin (Mount Sinai), Anthony Burrow (Cornell)
12:30 PM	Hosted lunch
1:30 PM	>Innovative Interventions Panel and rotating table conversations with Greg Walton (Stanford), Beth Darnall (Stanford), Yi-Yuan Tang (Texas Tech), Alana Conner (Stanford), MarYam Hamedani (Stanford)
3:30 PM	Break
3:45 PM	>Exploring Emotions Panel discussion with Erick Ramirez (Santa Clara), Ozlem Ayduk (UC Berkeley), Adam Anderson (Cornell)
5:00 PM	>Reflections
5:30 PM	Adjourn; dinner on own

WEDNESDAY, DECEMBER 6

	BECHTEL CONFERENCE CENTER, ENCINA HALL
8:30 AM	Continental breakfast
9:00 AM	Overnight Thoughts
9:30 AM	>Mechanisms of Mind-Body Interactions Brief presentations and Q&A with Charles Raison (Emory), Rick Hecht (UCSF), Lauren Atlas (NIH), Nancey Murphy (Fuller)



11:30 AM	Break
11:45 AM	>The Roles of Religion and Spirituality Panel discussion with George Grant (Emory), Amy Krentzman (Minnesota), Chikako Ozawa-de Silva (Emory)
12:45 PM	Hosted lunch
1:45 PM	>Culture and Context Panel and rotating table conversations with Daniel Lende (South Florida), Rebecca Seligman (Northwestern), Jason Okonofua (UC Berkeley), Neha John-Henderson (Montana), Hazel Markus (Stanford)
3:45 PM	Break
4:00 PM	>The Influence of Community Panel discussion with Lourdes Rodriguez (Texas), Anissa Vines (UNC), Larry Wallack (Portland State)
5:15 PM	>Reflections
5:45 PM	Cocktails and dinner

THURSDAY, DECEMBER 7

	BECHTEL CONFERENCE CENTER, ENCINA HALL
8:30 AM	Continental breakfast
9:00 AM	>Insights from Individual Practice Mindfulness exercise and conversations
10:00 AM	>Emerging Patterns, Open Questions Table working sessions with report-out
11:30 AM	Break
11:45 AM	>Reflections Panel discussion with Bill Newxsome (Stanford), Alia Crum (Stanford), John Campbell (UC Berkeley), David Becker (UCSF)
12:45 PM	Closing Thoughts
1:00 PM	Adjourn & box lunches

Sponsors: The Templeton World Charities Foundation, The Robert Wood Johnson Foundation, Stanford Neurosciences Institute



These definitions were offered in the course of the meeting at Stanford and helped frame our interdisciplinary conversations onsite. We hope that providing the glossary in context (accompanied, in some cases, by related definitions/sources in italics), will prove useful in reading and interpreting this report.

ADDICTION AND RECOVERY

Addiction is a complex condition, a brain disease that is manifested by compulsive substance use despite harmful consequence.

[HTTPS://WWW.PSYCHIATRY.ORG/PATIENTS-FAMILIES/ADDICTION/WHAT-IS-ADDICTION](https://www.psychiatry.org/patients-families/addiction/what-is-addiction)

[For recovery from addiction,] I use the Betty Ford consortium definition, which is abstinence from the addictive behavior, plus increases in quality of life, and other life activity...What works for addiction is that the addicted individual should stop the addictive behavior and stay stopped for all the days of the rest of their lives.

– AMY KRENTZMAN, UNIVERSITY OF MINNESOTA SCHOOL OF SOCIAL WORK

BLIND ANALYSIS

Would the field of physics and its move toward a model of blind analysis of data serve as a guide for research on the power of minds?

– JOHN CAMPBELL, UNIVERSITY OF CALIFORNIA, BERKELEY

Decades ago, physicists including Richard Feynman noticed something worrying. New estimates of basic physical constants were often closer to published values than would be expected given standard errors of measurement. They realized that researchers were more likely to 'confirm' past results than refute them — results that did not conform to their expectation. To minimize this problem, teams of particle physicists and cosmologists developed methods of blind analysis: temporarily and judiciously removing data labels and altering data values to fight bias and error. By the early 2000s, the technique had become widespread in areas of particle and nuclear physics.

[HTTPS://WWW.NATURE.COM/NEWS/BLIND-ANALYSIS-HIDE-RESULTS-TO-SEEK-THE-TRUTH-1.18510](https://www.nature.com/news/blind-analysis-hide-results-to-see-the-truth-1.18510)

COGNITIVELY BASED COMPASSION TRAINING (CBCT)

[CBCT is] really a cognitive restructuring. And what I think differentiates it in some ways from other sorts of current cognitive restructuring is that it's based on some very radical ideas, the most radical of which is that enemies are hugely valuable resources for people, and that we are as interconnected with our enemies as we are with our friends. In fact, these categories we use don't reflect deeper underlying realities.

– CHUCK RAISON, UW-MADISON AND EMORY UNIVERSITY

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CBCT is a method for cultivating greater well-being through the use of reflective practices. Developed at Emory University in 2004 by Geshe Lobsang Tenzin Negi, PhD, CBCT is based on centuries-old techniques from the Indo-Tibetan tradition. Negi drew from the [lojong tradition](#), a set of meditative practices designed to bring about 'thought transformation,' to create this contemporary and secular method. CBCT is independent from – and in many ways supportive of – any faith or belief system.

[HTTPS://TIBET.EMORY.EDU/COGNITIVELY-BASED-COMPASSION-TRAINING/INDEX.HTML](https://tibet.emory.edu/cognitively-based-compassion-training/index.html)

COGNITIVE BEHAVIORAL THERAPY (CBT)

In 2006 I saw an article in The New York Times describing this avuncular looking man named Aaron Beck at the University of Pennsylvania, who had just won the Lasker Award. The Lasker Award, for those of you who don't know, is sort of an American pre-Nobel for biomedical and medicine. Beck was the inventor of cognitive behavioral therapy., which he himself actually described as cognitive restructuring to actually change people's beliefs about the world and the way they interacted with the world. This was really startling to me because psychiatry as a field went toward drugs – bottom up ways of treating psychiatric disease in the 1970s – when all of these transmitter systems and their receptors were identified in the brain by neuroscientists.

Psychiatry is coming back in a different direction now. People are convinced by papers in *The New England Journal of Medicine* that have been reproduced in quite broad studies with severely depressed patients. You treat some of them with antidepressants, which are classic knob-turning at the levels of receptors and molecules. You treat some of them with CBT which is a very high-level, top-down intervention, and then you treat another group with both at the same time. Of course you have a control group that you're monitoring with no treatment.

The bottom line is that the antidepressants and CBT together are better than either alone. Now that says something important I think about us as humans. It says, we really are bottom-up creatures. Those receptors and those transmitter systems really do matter for our behavior, our high-level cognition, and our healthy interaction with the world. But it also says that we are top down creatures and that beliefs matter.

– BILL NEWSOME, STANFORD UNIVERSITY

COMPLEX ADAPTIVE SYSTEMS

Systems that operate not on the basis of predetermined goals and feedback loops, for example the homeostatic systems in an organism, but also have the capacity to select their own goals, and thereby adapt to new circumstances. When such systems also have some sort of memory, a way of storing information about what has or has not worked in the past, there is heightened ability for the system to increase its adaptation over time. Humans who are complex, self-organizing, dynamical, adaptive

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systems are partially decoupled from their biology. They attend selectively to environmental constraints, and thus are able to become agents in their own right. ...Most often it is not merely our neurons that make us do and experience what we do.

One of the characteristics of a complex system is that history matters. And of course the history can drive a system in a negative direction.

– NANCEY MURPHY, FULLER THEOLOGICAL SEMINARY

A complex system is simply a system in which many independent elements or agents interact, leading to emergent outcomes that are often difficult (or impossible) to predict simply by looking at the individual interactions. The “complex” part of CAS refers in fact to the vast interconnectedness of these systems.

[HTTPS://CODE.ORG/CURRICULUM/SCIENCE/FILES/CS_IN_SCIENCE_BACKGROUND_PAPERS.PDF](https://code.org/curriculum/science/files/cs_in_science_background_papers.pdf)

COMMUNITY BASED PARTICIPATORY RESEARCH (CBPR)

We can't forget about the community's capacity. It means not just giving them educational sheets, but helping them to understand researchers' role and the data. If community members can understand the data, they can help us interpret it.

– ANISSA VINES, UNIVERSITY OF NORTH CAROLINA, CHAPEL HILL

A partnership approach to research that equitably involves, for example, community members, organizational representatives, and researchers in all aspects of the research process and in which all partners contribute expertise and share decision making and ownership.

[HTTPS://EN.WIKIPEDIA.ORG/WIKI/COMMUNITY-BASED_PARTICIPATORY_RESEARCH](https://en.wikipedia.org/wiki/Community-based_participatory_research)

CULTURE CYCLE

Culture is all about change; it's never static. [The culture cycle comprises] the ideas, institutions, and interactions that guide the thinking, feeling, and biological being of individuals. Those four levels fit together into a mutually constituting dynamic. The individual is part of, not separate from, the culture. We are constantly influenced by our cultures and our actions feed back into the cultures.

– HAZEL MARKUS, STANFORD UNIVERSITY

INTEGRATIVE BODY-MIND TRAINING (IBMT)

[In IBMT] we help the participants, including the patient, the healthy population, to enter a special brain state.

– YI-YUAN TANG, TEXAS TECH UNIVERSITY

The method stresses no effort to control thoughts, but instead a state of restful alertness that allows a high degree of awareness of the body, breathing, and external

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instructions. A series of studies indicates that IBMT improves attention and self-regulation through interaction between the central (brain) and the autonomic (body) nervous systems.

[HTTPS://WWW.NCBI.NLM.NIH.GOV/PUBMED/22108815](https://www.ncbi.nlm.nih.gov/pubmed/22108815)

INTEGRATIVE MEDICINE

For those of us in the medical community who have latched on to this idea of integrative medicine, it means something fairly particular that's described in broad terms of wholeness, relationship, well-being, treating a person rather than treating a disease... and being present with patients.

– DAVID BECKER, UCSF OSHER CENTER FOR INTEGRATIVE MEDICINE

MINDFULNESS

What do we really mean by mindfulness? This is how Jon Kabat-Zinn, who helped develop mindfulness-based stress reduction described it: moment to moment, non-judgmental awareness of one's experience cultivated by paying attention.

– RICK HECHT, UCSF OSHER CENTER FOR INTEGRATIVE MEDICINE

Mindfulness is awareness that arises through paying attention, on purpose, in the present moment, non-judgementally. It's about knowing what is on your mind. [HTTPS://WWW.MINDFUL.ORG/JON-KABAT-ZINN-DEFINING-MINDFULNESS/](https://www.mindful.org/jon-kabat-zinn-defining-mindfulness/)

MINDFULNESS BASED STRESS REDUCTION (MBSR)

Mindfulness-based stress reduction (MBSR) is a program that incorporates mindfulness to assist people with pain and a range of conditions and life issues that were initially difficult to treat in a hospital setting. Developed at the University of Massachusetts Medical Center in the 1970s by Professor Jon Kabat-Zinn, MBSR uses a combination of mindfulness meditation, body awareness, and yoga to help people become more mindful. Controlled clinical research suggests it may have beneficial effects, including stress reduction, relaxation, and improvements to quality of life, but that it does not help prevent or cure disease.

[HTTPS://EN.WIKIPEDIA.ORG/WIKI/MINDFULNESS-BASED_STRESS_REDUCTION](https://en.wikipedia.org/wiki/Mindfulness-based_stress_reduction)

MINDSET

A mindset is quite literally a setting of the mind. It's a lens or frame of mind that orients us to a particular set of associations and expectations. Mindsets can create a whole host of different expectations. Mindsets are tightly connected with the schemas in cognitive sets. Mindsets operate at the top of a schematic hierarchy; when you change the mindset, the whole schema changes.

– ALIA CRUM, STANFORD UNIVERSITY

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Mind and body can only be considered in context, and context includes many different aspects and levels. Each of us are nodes in an intersecting culture cycle. We're all complex, we're all multicultural. That makes the challenge of thinking how culture can influence us difficult but extremely important. ...If you're going to influence a mindset, or if you're going to create a mindset and hope that it's going to be powerful for a given individual, then that mindset has to be supported by the culture cycle. I can give any of us a way to think about the self, and it can have some power, but it's going to have its most power if it is well-represented in people's cultural context.

– HAZEL MARKUS, STANFORD UNIVERSITY

REINTEGRATIVE SHAMING

[Reintegrative shaming, often used in criminal and juvenile justice settings] is shame targeted at features of your character that are malleable. Like being a jerk is a character trait that we might think is something you can change, even if it's very difficult. I do think and have argued that shame can do something that no other moral emotion can. Guilt can't do this, anger can't do this, disgust can't do this...

Non-reintegrative shaming is inappropriately targeted at things we can't change about ourselves, or that is casting you as a member of another group. That is bad and not reintegrative; it's not inviting you to come back in and allow yourself to help you change the property we're talking about.

– ERICK RAMIREZ, SANTA CLARA UNIVERSITY

Reintegrative shaming communicates disapproval within a continuum of respect for the offender; the offender is treated as a good person who has done a bad deed. Stigmatization is disrespectful shaming; the offender is treated as a bad person. Stigmatization is unforgiving – the offender is left with the stigma permanently, whereas reintegrative shaming is forgiving.

[HTTP://JOHNBRAITHWAITE.COM/WP-CONTENT/UPLOADS/2016/05/2000_REINTEGRATIVE-SHAMING.PDF](http://JOHNBRAITHWAITE.COM/WP-CONTENT/UPLOADS/2016/05/2000_REINTEGRATIVE-SHAMING.PDF)

RUMINATION

Rumination is this passive cycle of thinking about the reasons and causes of your emotions, or emotional states, which precipitates and maintains depression. It doesn't help. Most current models of rumination suggested that you should never ask 'why,' because 'why' is the evil component that defines rumination. When people ask 'why,' that's when they go abstract. They overgeneralize, and that's what's causing depression.

– OZ AYDUK, UNIVERSITY OF CALIFORNIA, BERKELEY

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MULTIPLE REALIZABILITY AND MUTUAL MANIPULABILITY

[To understand why humans beings are more than a “pack of neurons,” it’s helpful to keep two concepts in mind.] **Multiple Realizability:** If I believe that the Earth is round, and that belief then comes to affect my behavior many times over the course of a year, that is not always realized in exactly the same set of neurons each time I think that. It might be different actual neurons firing, and so that concept cannot be reduced generally to any specific collection of neurons.

There's a lot of richness also in thinking about causality and how we can think about causality at higher systems, which is essential to thinking about mindset and whether mindset is a causal intervention. **Mutual Manipulability**, from the book *Explaining the Brain...* That's causality par excellence. It gives a knob where I can turn, and I can get reliable effects in the world — that qualifies as causality. And behavioral intervention is just as causal as a molecular intervention.

— BILL NEWSOME, STANFORD UNIVERSITY

RECOVERY COACHING

How can we tap the experiences of people who are flourishing after encounters with mental illness? How can they help people avoid depression and help those who have experienced it? In work I'm doing with a community mental health association, we're calling the service recovery coaching, not peer support, because we want to elevate the impression and understanding of the help they provide almost to the level of practitioner.

— COREY KEYES, EMORY UNIVERSITY

SPIRITUALITY

This is [Kenneth Pargament's](#) definition. Spirituality is search for the sacred. Religiousness is search for significance in the context of established institutions designed to facilitate spirituality.

— AMY KRENTZMAN, UNIVERSITY OF MINNESOTA SCHOOL OF SOCIAL WORK

Applied spirituality is using spiritual practices and religious beliefs to change people's mindsets to improve their health.

— GEORGE H. GRANT, EMORY UNIVERSITY (PARAPHRASED BY AMEDEO TUMOLILLO)

STRUCTURAL STIGMA

Stigma is much broader than these concrete events and experiences. It's promulgated and reinforced through our social institutions, through the laws and policies that we pass, and through broad social and cultural norms that we have about members of

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stigmatized groups, and collectively that's what my colleagues and I call structural stigma.

These structural forces, the stigma that operate just below the surface, can have profound implications for the health of stigmatized individuals, not only for their mental health, but for their physical health as well.

– MARK HATZENBUEHLER, COLUMBIA UNIVERSITY

THERAPEUTIC ALLIANCE

What's the best kind of therapy? Is it CBCT, is it ACT, is it psychoanalysis? Comparative studies show that regardless of the treatment type, there's this thing called therapeutic alliance. That's where the main effect is. I conceptualize that as connection. That's what George Grant has been describing in terms of empathizing with patients and being present for them. When we talk about healing loneliness, it's not just about having one supportive person, but also that you create a connection to an imaginary, supportive figure, whether it's God or another entity. That's another form of connection, which I think reduces stress and can have all those positive physiological effects.

– HEATHER BERLIN, ICAHN SCHOOL OF MEDICINE, MOUNT SINAI

The therapeutic relationship (also therapeutic alliance, the helping alliance, or the working alliance) refers to the relationship between a healthcare professional and a client (or patient). It is the means by which a therapist and a client hope to engage with each other, and effect beneficial change in the client.

[HTTPS://EN.WIKIPEDIA.ORG/WIKI/THERAPEUTIC_RELATIONSHIP](https://en.wikipedia.org/wiki/Therapeutic_relationship)

WISE INTERVENTIONS

Interventions that are wise to the meanings that people make about themselves, about other people, about social situations, that then have proximate, powerful effects on how people behave in those particular situations. And a function in this model, a function of basic research, basic laboratory research, is to understand those meanings at an adequate level of detail so that we can then identify those that become deleterious and intervene upon them effectively.

One of the things that's important and special about this approach is that it prioritizes subjective meaning making. That's different for many, many other kinds of approaches to social reform that are predominant in our society, which often focus on objective qualities of people, like their abilities or their self-control, or objective qualities of social situations, like resources and incentives that exist in those situations. The focus is on how people make sense of themselves, other people, situations, so that people can behave in the ways that are most helpful and adaptive for them to help them flourish.

– GREG WALTON, STANFORD UNIVERSITY



Conference participants suggested we share the following resources, some of which are referenced elsewhere in this report.

Atlas LY & Wager T (2013). Expectancies and Beliefs: Insights from Cognitive Neuroscience. *The Oxford Handbook of Cognitive Neuroscience: Volume 2: The Cutting Edges*. Oxford, UK: Oxford University Press.

Baquendano C, Vergara R, Lopez V, Fabar C, Cosmelli D & Lutz A (2017). Compared to self-immersion, mindful attention reduces salivation and automatic food bias. *Scientific Reports* 7(1): 138-39.

Berlin HA (2011). The neural basis of the dynamic unconscious. *Neuropsychanalysis* 13(1): 5-31.

Bernard D & Neblett E (2017). A Culturally Informed Model of the Development of the Imposter Phenomenon Among African American Youth. *Adolescent Research Review*, published online 9/20/2017.

Berntson GG, Norman GJ, Hawkley LC & Cacioppo JT (2008). Spirituality and Autonomic Cardiac Control. *Annals of Behavioral Medicine*: 35(2): 198-208.

Carhart-Harris RL, Leech R, Hellyer PJ, Shanahan M, Feilding A, Tagliazucchi E, Chialvo DR & Nutt D (2014). The entropic brain: a theory of conscious states informed by neuroimaging research with psychedelic drugs. *Frontiers in Human Neuroscience* 8: 20.

Cole CW, Kemeny ME & Taylor SE (1997). Social Identity and Physical Health: Accelerated HIV Progression in Rejection-Sensitive Gay Men. *Journal of Personality and Social Psychology* 72(2): 320-335.

Craver CF (2014). *Explaining the Brain: Mechanisms and the Mosaic Unity of Neuroscience*. Ann Arbor, MI: Oxford Clarendon Press.

Crum AJ, Leibowitz KA, Verghese A (2017). Making mindset Matter. *The British Medical Journal* 356: j674; erratum *The BMJ* 359: j5308.

Crum A & Zuckerman B (2017). Changing Mindsets to Enhance Treatment Effectiveness. *Journal of the American Medical Association* 317(2): 2063-2064.

Fields KE & Fields BJ (2014). *Racecraft: the Soul of Inequality in American Life*. London, UK: Verso Books.

Foot P (2010). *Natural Goodness*. Oxford, UK: Oxford University Press.

CONFERENCE RESOURCE LIST

Gravlee CC (2009). How race becomes biology: embodiment of social inequality. *American Journal of Physical Anthropology* 139(1): 47-57.

Hekler EB, Klasnja P, Riley WT, Buman MP, Huberty J, Rivera DE & Martin CA (2016). Agile science: creating useful products for behavior change in the real world. *Translational Behavioral Medicine* 6(2): 317-28.

Hertzman C & Boyce T (2010). How experience gets under the skin to create gradients in developmental health. *Annual Review of Public Health* 31: 329-47.

Hutchins E (2011). Enculturating the Supersized Mind. *Philosophical Studies*: 152(3): 437-446.

Jacobs J (1961). *The Death and Life of Great American Cities*. New York, NY: Random House.

Jaworski W (2011). *Philosophy of Mind: a Comprehensive Introduction*. Malden, MA: Wiley-Blackwell.

Keller MB, McCullough JP, Klein DN, Arnow B, Dunner DL, Gelenberg AJ, Markowitz JC, Nemeroff CB, Russell, JM, Thase ME, Trivedi MH, Blalock JA, Borian FE, Jody DN, DeBattista C, Koran LM, Schatzberg AF, Fawcett J, Hirschfeld RMA, Keitner G, Miller I, Kocsis JH, Kornstein SG, Manber R, Ninan PT, Rothbaum B, Rush AJ, Vivian D & Zajecka J (2000). A Comparison of Nefazodone, the Cognitive Behavioral-Analysis System of Psychotherapy, and their Combination for the Treatment of Chronic Depression. *The New England Journal of Medicine* 342: 1462-1470.

Keyes CL (2009). The Black-White paradox in health: flourishing in the face of social inequality and discrimination. *Journal of Personality* 77(6): 1677-706.

Kirmayer LJ (1992). The Body's Insistence on Meaning: Metaphor as Presentation and Representation in Illness Experience. *Medical Anthropology Quarterly* 6(4): 323-346.

Kirmayer LJ & Sartorius N (2007). Cultural models and somatic syndromes. *Psychosomatic Medicine* 69(9): 832-40.

Klasnja P, Hekler EB, Shiffman S, Boruvka A, Almirall D, Tewari A & Murphy SA (2015). Microrandomized trials: An experimental design for developing just-in-time adaptive interventions. *Health Psychology* 34S: 1220-8.

Koch C (2012). *Consciousness: Confessions of a Romantic Reductionist*. Cambridge, MA: MIT Press.

Lang EV, Benotsch EG, Fick LJ, Lutgendorf S, Berbaum ML, Berbaum KS, Logan H & Spiegel D (2000). Adjunctive non-pharmacological analgesia for invasive medical procedures: a randomised trial. *The Lancet* 355(9214): 1486-90.

CONFERENCE RESOURCE LIST

Lende DH & Downey G (2012). *The Encultured Brain: An Introduction to Neuroanthropology*. Cambridge, MA: MIT Press.

Markus HR & Moya PML (2010). *Doing Race: 21 Essays for the 21st Century*. New York, NY: W.W. Norton & Co.

Markus HR & Conner A (2013). *Clash!: How to Thrive in a Multicultural World*. New York, NY: Plume.

Miller G, Chen E & Cole SW (2009). Health psychology: developing biologically plausible models linking the social world and physical health. *Annual Review of Psychology* 60: 501-24.

Morgan N, Irwin MR, Chung M & Wang C (2014). The effects of mind-body therapies on the immune system: meta-analysis. *PLOS ONE* 9(7): e100903.

Okonofua JA, Paunesku D, Walton GM (2016). Brief intervention to encourage empathic discipline cuts suspension rates in half among adolescents. *Proceedings of the National Academy of Sciences* 113(19): 5221-6.

Okonofua JA, Walton GM & Eberhardt JL (2016). A Vicious Cycle: A Social-Psychological Account of Extreme Racial Disparities in School Discipline. *Perspectives on Psychological Science* 11(3): 381-98.

Orvell A, Kross E & Gelman SA (2017). How “you” makes meaning. *Science* 355(6331): 1299-1302.

Paunesku D, Walton GM, Romero C, Smith EN, Yeager DS, & Dweck CS (2015). Mind-set interventions are a scalable treatment for academic underachievement. *Psychological Science* 26(6): 784-93.

Portes A (2000). The Two Meanings of Social Capital. *Sociological Forum* 15(1): 1-12.

Rose G (1985). Sick Individuals and Sick Populations. *International Journal of Epidemiology* 1(1): 32-38.

Rose G (2005). *The Strategy of Preventive Medicine*. Oxford, UK: Oxford University Press.

Spiegel D (2014). Minding the body: Psychotherapy and cancer survival. *British Journal of Health Psychology* 19(3): 465-85.

Steele CM & Aronson J (1995). Stereotype Threat and the Intellectual Test Performance of African Americans. *Journal of Personality and Social Psychology* 69(5): 797-811.

CONFERENCE RESOURCE LIST

Tang YY, Hölzel BK & Posner MI (2015). The neuroscience of mindfulness meditation. *Nature Reviews Neuroscience* 16(4): 213-25.

Travers-Hill E, Dunn BD, Hoppitt L, Hitchcock C & Dalgleish T (2017). Beneficial effects of training in self-distancing and perspective broadening for people with a history of recurrent depression. *Behaviour Research and Therapy* 95: 19-28.

Treatment for Adolescents With Depression Study (“TADS”) Team (2004). Fluoxetine, Cognitive-Behavioral Therapy, and their Combination for Adolescents with Depression. *Journal of the American Medical Association* 292(7): 807:820.

Van Dam NT, van Vugt MK, Vago DR, Schmalzl L, Saron CD, Olendzki A, Meissner T, Lazar SW, Kerr CE, Gorchov J, Fox KCR, Field BA, Britton WB, Brefczynski-Lewis JA & Meyer DE (2018). Mind the Hype: A Critical Evaluation and Prescriptive Agenda for Research on Mindfulness and Meditation. *Perspectives on Psychological Science* 13(1): 36-61.

Wager TD & Atlas LY (2015). The neuroscience of placebo effects: connecting context, learning and health. *Nature Reviews Neuroscience* 16(7): 403-18.

Walton GM (2014). The New Science of Wise Psychological Interventions. *Current Directions in Psychological Science* 23(1): 73-82.

Woods-Giscombé CL & Black AR (2010). Mind-Body Interventions to Reduce Risk for Health Disparities Related to Stress and Strength Among African American Women: The Potential of Mindfulness-Based Stress Reduction, Loving-Kindness, and the NTU Therapeutic Framework. *Complementary Health Practice Review* 15(3): 115-131.

Woods-Giscombé CL (2010). Superwoman schema: African American women’s views on stress, strength, and health. *Qualitative Health Research* 20(5): 668-83.

Yapko MD (2011). *Mindfulness and Hypnosis: the Power of Suggestion to Transform Experience*. New York, NY: Norton.



These videos were produced before and during the Power of Minds conference at Stanford University, in order to share some of the interdisciplinary research and perspectives with public audiences. Additional interviews (PDF) will be added shortly to the Power of Minds section of the Worldview Stanford website at <http://worldview.stanford.edu/media-project/power-of-minds>.



THE PURPOSE OF PURPOSE

Anthony Burrow, PhD, Associate Professor, College of Human Ecology, Cornell University

Cultivating a sense of purpose – a prospective, intentional aim that has value in the world – may help us manage stress better and live longer, says Cornell psychologist Anthony Burrow.



THE LIMITS OF MINDSET

Alia Crum, PhD, Assistant Professor, Psychology, Stanford University

Mindset is a lens or frame of mind through which we view the world and can change our physiology – weight, stress, health outcomes – explains Stanford psychology professor Alia Crum. What we don't know are the limits of mindset – how much we can we change our realities by changing our minds.



CATASTROPHIZING PAIN

Beth Darnall, PhD, Clinical Professor, Department of Anesthesiology, Perioperative and Pain Medicine, Stanford University

Pain catastrophizing – obsessively ruminating on pain – increases patient suffering, predicts many adverse health and post-surgical outcomes, and is fueling the opioid epidemic, says Stanford psychologist Beth Darnall. Interventions can change these debilitating mindsets – and at scale.



WHY MINDSET MATTERS

Carol Dweck, PhD, Professor of Psychology, Stanford University

Adopting a growth mindset (seeking out and enjoying new challenges) rather than a fixed mindset (seeing capabilities as set in stone) can improve performance and resilience, says Stanford psychology professor Carol Dweck, a pioneer in the field.

To view these videos and other media produced for The Power of Minds
»<http://worldview.stanford.edu/media-project/power-of-minds>



THE IMPACTS OF STRUCTURAL STIGMA

Mark L. Hatzenbuehler, PhD, Associate Professor, Sociomedical Sciences & Sociology, Columbia University

Beware of structural stigma, which is created and sustained by social, institutional and policy structures, says Columbia clinical psychologist Mark Hatzenbuehler. Living with high levels of structural stigma can get under the skin, causing adverse mental and physical health outcomes and inequities. (See associated interview, “How Stigma Gets Under the Skin”)



BEING CONSCIOUS

Bill Newsome, PhD, Professor, Neurobiology and Director, Stanford Neurosciences Institute

Humans are both “top-down” (brain-driven) and bottom-up (biologically driven) creatures, says Stanford neurobiologist Bill Newsome. Consciousness is a powerful, if poorly understood, top-down phenomenon that enables freedom of choice and personal growth.



THE COMMUNITY POTLUCK

Lourdes Rodriguez, DrPH, Director of the Center for Place-Based Initiatives, University of Texas

We can democratize public health by using a community potluck approach, says Lourdes Rodriguez, a professor at the University of Texas. Mobilizing the unique resources and gifts of all members of a community is key to identifying problems and finding solutions.



PUBLIC PLACES, PUBLIC HEALTH

Lourdes Rodriguez, DrPH, Director of the Center for Place-Based Initiatives, University of Texas

If we focus only on the individual, we lose the relational, collective lens. Our personal networks and public spaces are critical resources for promoting health, says Lourdes Rodriguez, a professor at the University of Texas.



OUR BODIES, OUR STRESS

David Spiegel, MD, Professor, Psychiatry and Behavioral Sciences, Stanford University

Stress is an intrinsic part of human life. But, says Stanford psychiatry professor David Spiegel, learning to optimally manage stress requires us to reframe our relationship to our bodies. We are not our bodies. (See associated interview: “Your Self and Your Body”)



PAIN IN THE BRAIN

Tor Wager, PhD, Professor of Psychology, Neuroscience, & Cognitive Science, University of Colorado

Is there a neural signature for pain? Cognitive psychologist and neuroscientist Tor Wager is searching for underlying mechanisms and robust measures of pain across studies, individuals, cultures, contexts, and interventions to understand what works and why.



MINDSET AND BELONGING

Greg Walton, PhD, Associate Professor, Psychology, Stanford University

Belonging is not only essential to who we are as human beings, but it is also connected to our health, achievement and well being, says Stanford clinical psychologist Greg Walton.



Tor Wager

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