2016 IMPACT REPORT



Mission: To cultivate well-being and relieve suffering through a scientific understanding of the mind

Vision:

A kinder, wiser, more compassionate world

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How do you **#maketheworld** a better place? Let us know on social media.





Change. It's what we want to create in the world to make it better.

How we interpret and respond to change is everything. It can lead to our well-being or it can lead to our suffering – two sides of the same coin inherent to our mission at the Center for Healthy Minds.

Change abounds now more than ever, and it's time for us to put our research findings into action – to cultivate mindful attitudes and brave hearts as our Center grows and becomes increasingly visible and impact-driven. With this awareness, we reflect on our activities this past year and look ahead with boundless gratitude, inspiration and determination.

As you'll learn more in the following pages, your support and membership in the Center community has led to accomplishments that make the world a better place.

You welcomed three new faculty members, each prominent leaders who will bring well-being to the world in new and exciting ways. You helped your Center secure funding for six additional faculty members, in fields ranging from child development to women's well-being and economics.

You encouraged science that yielded more than 30 peerreviewed publications in prestigious journals, including findings on the effects of stress on the immune system, new frameworks to study meditation and the impact mindfulness has on respiration rate.

Your Center forged global relationships with organizations such as National Geographic Society, Hyatt, Steelcase and one of the "Big Four" accounting firms and deepened our relationship with the Mind and Life Institute.

You brought His Holiness the Dalai Lama to Madison for a global conversation like no other and devised strategies to push aspiration to action, reaching more than 80 countries worldwide.

But there's still so much to be done. We recognize your dedication to promote human connection and harmony from your own journey. You see the importance in reinvesting in human flourishing and why we need this now.

You continue to inspire us to do better, to do nothing short of changing the world.

With deep gratitude,

Richiz

Richard J. Davidson

Founder, Center for Healthy Minds

P.S. – Thanks to UW–Madison leadership and College of Letters & Science Dean Karl Scholz, our community will be moving into a beautiful, historic building in Madison in January of 2017. This will enable all of us to be in one space that will make it much easier to collaborate, build shared purpose, integrate new faculty and even study the impact of physical environment on well-being.

Message from the Executive Director

"There is no power for change greater than a community discovering what it cares about."

- Margaret Wheatley

Our remarkable community of scientists, research and innovation staff is proud to share this report with you. This point in time in the Center's history will be remembered as the tipping point that propelled our 5-Year Strategic Vision forward in directions we could not have even imagined.

It started with a lead gift to the Center from a visionary anonymous donor that positioned us to take advantage of the extraordinary and timely support of generous donors and longtime university supporters John and Tashia Morgridge. These acts of generosity have led to funding for nine new faculty positions. Recruiting new faculty is the single, most important initiative to sustain and accelerate our research, ensure future leadership and generate novel discoveries that will impact well-being for generations to come.

Next, we were granted official "center" status at UW-Madison. This is important because it reflects the university's support for our Center's growth, which includes building a team of faculty, scientists, students and administrative staff that enable us to conduct more research, accelerate scientific discoveries on neuroscience and well-being, generate more competitive grants/funding, enrich the student experience and contribute to the Wisconsin Idea. The transition brings us the highly respected leadership of the Dean of the College of Letters & Science, Karl Scholz, who enthusiastically supports our Center's vision.

This year also marked the launch of Healthy Minds Innovations, Inc., a new 501(c)(3) nonprofit organization focused on launching innovation and social movement initiatives aimed at improving well-being. So far, we've assembled a talented board and team that are hard at work bringing wellbeing tools to the world. Revenues



generated through the nonprofit will be directed to the Center for Healthy Minds to support ongoing research.

All of this was possible because of you. Every one of these big breakthroughs began with small conversations with people like you who truly care about building a better world. You've made us better systems thinkers and brought us resources, new knowledge, courage and commitment that will lead to a kinder, wiser, more compassionate world.

With deep gratitude,

Brubun Mathism

Barbara Mathison

Executive Director, Center for Healthy Minds Healthy Minds Innovations

Unique Trauma Calls for Unique Treatments

For individuals with post-traumatic stress disorder (PTSD), the body's fight-or-flight responses can be triggered more easily in situations when threats are milder or not present at all.

Dan Grupe, a Center postdoctoral research associate, says part of the reason the disorder has been so difficult to treat is because the scientific and medical communities have underestimated its complexity.

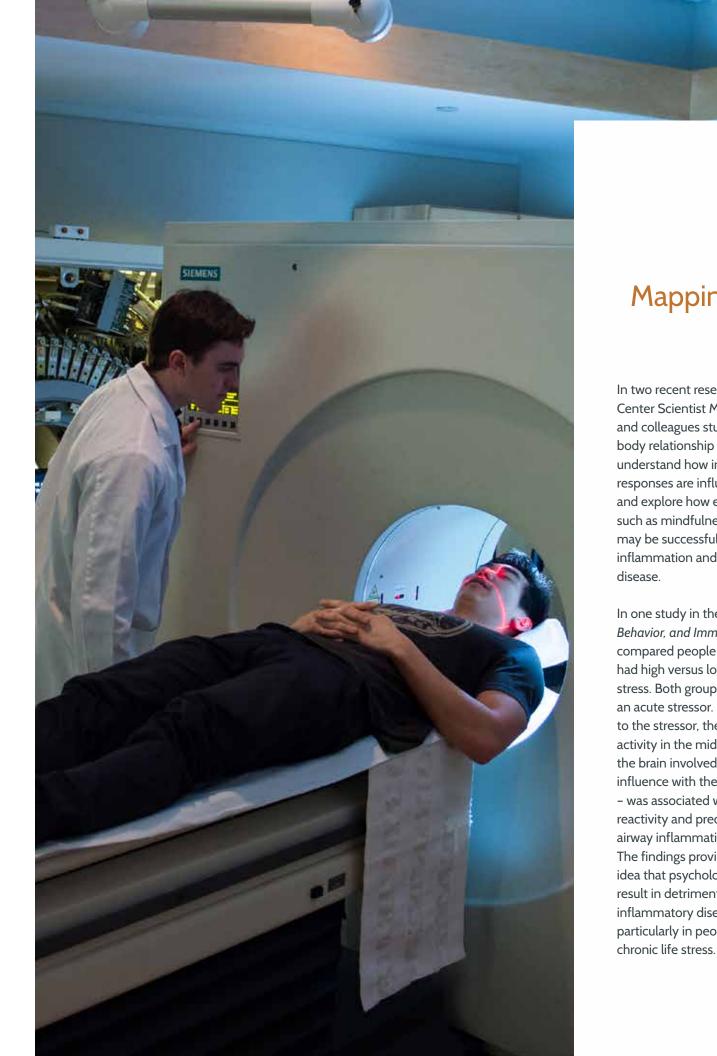
He and a team of researchers led a recent study published in the journal *Psychological Medicine* expanding the idea that distinct symptoms of PTSD can be observed in different patterns of brain activation in response to threats.

Symptoms are mostly identified in clusters, but the source of these disparate symptoms – the brain's reactions – are just beginning to be identified and understood, which could hold promise for better treatment for the 7 to 8 percent of people who experience PTSD in their lifetime.

In the study, the team examined how patterns in the brain – which circuits became active at specific points in time – differed among participants with PTSD when they were exposed to a mild, unpredictable threat in the lab. By studying the ventromedial prefrontal cortex (vmPFC), a part of the brain that tells other areas such as the amygdala that danger has passed, researchers can parse through whether this region is over-active, resulting in some of the hyper-aroused symptoms common to PTSD.

One extension of this research, Grupe says, is for researchers to eventually map different symptom profiles to distinct patterns in the brain and use knowledge from other studies to determine what an effective treatment option might be – in this instance, say mental or physical practices known to alter the function of the vmPFC.

Although much work remains to be done in linking PTSD symptoms, brain activation patterns and different forms of treatment, Grupe hopes this line of research will help advance more personalized treatment approaches and allow those suffering from trauma to demonstrate resilience in the face of life's stresses.



ADVANCE THE RESEARCH

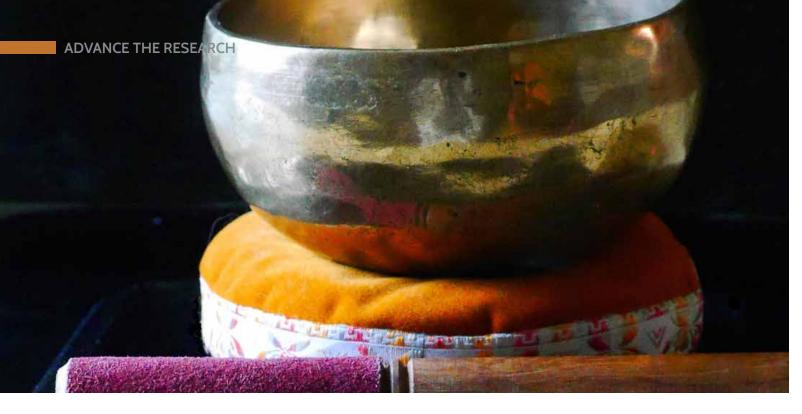
Mind Over Matter? Mapping the Two-Way Street of the Brain and Immune System

In two recent research papers, Center Scientist Melissa Rosenkranz and colleagues studied the mindbody relationship in efforts to help understand how inflammatory responses are influenced by the brain and explore how existing interventions such as mindfulness meditation may be successful ways to manage inflammation and the expression of

In one study in the journal Brain, Behavior, and Immunity, the group compared people with asthma that had high versus low levels of chronic stress. Both groups were exposed to an acute stressor. During exposure to the stressor, the increase in activity in the mid-insula - a part of the brain involved in bi-directional influence with the state of the body - was associated with greater stress reactivity and predicted subsequent airway inflammation after the stressor. The findings provide support for the idea that psychological stressors result in detrimental outcomes in inflammatory disease expression, particularly in people experiencing

In another study, Rosenkranz and scientists measured inflammatory responses in experienced meditators and people with no or little meditation experience. By examining participants' responses to an acute stressor through their levels of cortisol - a stress hormone - in saliva samples and inflammatory response to a topical capsaicin cream, the team found that experienced meditators showed lower reactivity, suggesting that meditation practices may be helpful in mitigating inflammatory responses brought about by psychological stress.

With roughly 10 percent of the U.S. population living with asthma, and inflammation being a contributor to many other chronic conditions such as cancer, heart disease and Alzheimer's disease, Rosenkranz says the findings are important in challenging the medical community to look beyond pharmaceutical approaches to address these physical manifestations of disease and to also consider strategies that harness the influence of the mind on the body.



Scholars and Researchers Push to Expand Types of Meditation Studied

The scientific study of meditation has illuminated a great deal about the mind, brain and well-being, but there's still much to learn. Researchers know the inputs and are beginning to comprehend the outputs, but the mechanisms – what's going on at a neuroscientific level in the moment – to improve well-being and relieve suffering are just beginning to be understood.

To expand what's possible in the field, a Center team led by Graduate Student Cortland Dahl is encouraging clinicians, psychologists and neuroscientists to consider an abundance of other contemplative practices for exploration.

In a recent paper in the journal *Trends in Cognitive Neuroscience,* the group proposes a new framework to more

fully orient the growing scientific and popular interest in meditation. The new framework enriches an understanding of the different forms of mindfulness and compassion techniques used in secular contexts today and also introduces new families of meditation that have yet to be subjected to scientific inquiry. Dahl says mindfulness and compassion meditations are two of literally thousands of types of meditations to explore. Since there's no one-size-fitsall approach to well-being, a diversity of meditation types could yield helpful results for a range of people.

The team proposes grouping meditation practices in three families - attentional, constructive and deconstructive, each with different cognitive mechanisms and the ability to target different networks

in the brain. To date, most studies on meditation have focused on mindfulness, a grouping of practices found in the attentional family. Some of these practices lesserknown to science are thought to aid in the cultivation of well-being by strengthening healthy qualities of mind such as resilience and kindness. Others do so by uncovering beliefs and attitudes that hinder well-being, which can be unveiled by probing a person's underlying construction of the self and examining the nature of these beliefs and the way in which they shape a person's subjective experience.

The more specific researchers can be with meditation practices, the better chance they can understand what mechanisms are at play in the mind, brain and body.

For a full list of studies published at the Center, visit: centerhealthyminds.org/science/publications

Savoring Contributes to Well-Being

New Center research suggests that in addition to how often we experience positive emotions, how long we experience them matters, too.

Aaron Heller, a former graduate student at the Center and current assistant professor of psychology at the University of Miami, wants to know why one person can savor a beautiful sunset or a memorable meal while another person susceptible to depression can't savor that sunset and those positive emotions subside quickly.

Heller and colleagues' findings from a recent experiment, published in the *Journal of Neuroscience*, suggest that the duration of activity in specific circuits of the brain, even over relatively short periods of time such as seconds, can predict the persistence of a person's positive emotion minutes and hours later.

In the study, participants played a short guessing game and answered questions about their emotions when prompted by a smartphone over a 10day period. Participants would win or lose the guessing game at random and win money when they were right.

Winning was intended to give people bursts of positive emotion, while not winning was intended to create negative feelings. To learn how long these emotions lingered after the game, the program asked a series of questions on average every 15 minutes afterward to get a sense of



whether people were savoring positive or negative emotion – or neither.

The same participants played the guessing game while scientists collected functional MRI scans of their brains. Individuals with more persistent activation in the part of their brain associated with reward and reward learning – called the ventral striatum - reported positive emotion that was sustained for longer periods of time after the game. The magnitude of activation in another area of the brain responsible for executive functioning, the dorsal lateral prefrontal cortex, predicted how much a person's positive emotion increased immediately following a reward.

New Faculty Expands Our **Research and Impact**

New faculty is the single most important initiative to deepen and broaden our impact. Thanks to your support, the Center is thrilled to welcome three new world-class faculty members and plans to recruit six additional faculty members in fields ranging from economics to women's well-being to pursue its vision of a kinder, wiser, more compassionate world.



New faculty member Charles Raison talks about future directions in science and of the Center at the 2015 Center Lab Retreat



Larissa Duncan

Larissa Duncan is the Elizabeth C. Davies Chair in Child & Family Well-Being and Associate Professor of Human Development and Family Studies in the UW-Madison School of Human Ecology.

She is internationally recognized for developing a framework to promote and assess mindful parenting as well as her work to bring mindfulness and compassion training to pregnant women, children and adolescents, and families in diverse community contexts. She also studies the biological and psychological pathways through which secular contemplative practices may support child and family well-being and improve health equity.

The Center and UW-Madison are deeply grateful to Elizabeth and Mark Schar as well as John and Tashia Morgridge for their instrumental gifts to create the Elizabeth C. Davies Chair in Child & Family Well-Being.

Charles Raison is the Mary Sue and Mike Shannon Chair for Healthy Minds, Children & Families as well as Professor of Human Development and Family Studies at the School of Human Ecology, and Professor in the Department of Psychiatry at UW-Madison's School of Medicine and Public Health.

training.



Charles Raison

As a psychiatrist and researcher, 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 examining the physical and behavioral effects of compassion

The Center and UW-Madison extend a deep bow of gratitude to Mary Sue and Mike Shannon for their gift to create the Mary Sue and Mike Shannon Chair for Healthy Minds, Children & Families.



John Dunne

John Dunne holds the Distinguished Chair in Contemplative Humanities, a newly endowed position created through the Center, and a coappointment in the Department of East Asian Languages and Literature at UW-Madison, where he's an active contributor to the creation of a new program in Asian Languages & Cultures.

His work focuses on Buddhist philosophy and contemplative practice, especially in dialogue with cognitive science and psychology. His publications appear in venues ranging across both the humanities and the sciences, and they include works on Buddhist philosophy, contemplative practice and their interpretation within scientific contexts. His current research focuses especially on the varieties of mindfulness and the contemplative theories that inquire into its nature.

The Center and UW-Madison express heartfelt thanks to Peggy Hedberg, Tim and Fran Orrok, the Hershey Family Foundation, and John and Tashia Morgridge for their investment in creating the Distinguished Chair in Contemplative Humanities.

Healthy Minds Innovations

We're excited to launch Healthy Minds Innovations, Inc, a 501(c)(3) nonprofit organization dedicated to expanding insights from the Center for Healthy Minds' research and developing services, tools and technologies to support the Center's mission to promote well-being and relieve suffering in the world.

The Healthy Minds Innovations Board of Directors includes Richard Davidson, Isa Dolski (ex officio) and Barbara Mathison (ex officio), in addition to the expertise, wisdom and generosity of Steve Arnold, Rick Langer and Greg Lynch, who have dedicated countless hours of service to the board and launch of Healthy Minds Innovations.

Steve Arnold

Board Chair

Steve is active with a number of organizations focusing on innovation in education. He is also Co-Founder and Vice Chairman of the Board of Directors of the George Lucas Educational Foundation, an operating foundation that promotes innovation and publishes stories of exemplary programs in teaching and learning at Edutopia.org.



Rick Langer Secretary Treasurer

Rick is a lawyer and partner in Michael Best & Friedrich, LLP, concentrating his practice in the areas of estate planning, estate administration, business succession planning, prenuptial agreements and marital property. Rick is passionate about his work with nonprofit organizations and is a director and/or officer of numerous charitable organizations, all dedicated to relieving human suffering.



Greg Lynch Advisor

Greg, a corporate attorney at Michael Best & Friedrich LLP, is an advisor to Healthy Minds Innovations, assisting with its corporate governance and commercialization activities. Greg has a strong personal interest in the areas of well-being, neuroscience, psychology, ecology and contemplative practices across religious traditions.





Center Contributes to National Conversations on Trauma-Informed Care

The Center for Healthy Minds is teaming up with the Wisconsin Office of Children's Mental Health to participate in Mobilizing Action for Resilient Communities (MARC), a coalition to address the impact of childhood adversity and build a movement toward a just, healthy and resilient world.

A part of a larger project launched by The Health Federation of Philadelphia and supported by the Robert Wood Johnson Foundation and the California Endowment, the MARC initiative fosters solutions to prevent Adverse Childhood Experiences (ACEs) – such as neglect, abuse and abandonment – and to promote resilience in families throughout the nation. In the United States, it's estimated that almost half of children have experienced at least one ACE and one fourth have experienced two or more. These "ACEs" have been shown to have a variety of negative lifelong impacts on health and behavior. Center research has focused on and continues to explore how negative experiences influence a range of psychological and well-being outcomes.

The MARC initiative demonstrates a shift in thinking about how we respond to the negative and longlasting impacts of trauma. And Wisconsin's been a leader in this area since 2008, prompted by a grassroots interest in the ACEs-based philosophy called "Trauma-Informed

Care." In 2012, Wisconsin's First Lady Tonette Walker saw the potential for healing in adopting trauma-informed care and created a private-public partnership called "Fostering Futures" to ensure that Wisconsin becomes the first trauma-informed state in the country. In a trauma-informed framework, the difference between understanding people using a traumainformed lens and business-as-usual is taking the perspective, "What happened to you?" instead of "What's wrong with you?" This shift often enriches relationships in a way that can lead to understanding and healing.

Creating Resilient **Communities**



As a trained social worker, Jennifer Jones understands the complex issues that impact the well-being of children and their families.

She grew up in a working-class home in Wisconsin and was the first in her immediate family to attend college.

"We certainly struggled financially," Jones says, "but I didn't know I was poor until I started learning about poverty."

She first noticed this problem more broadly when she attended Marquette University in Milwaukee, Wisconsin. "I literally had to step over homeless people on my way to class. I was in shock that our society allowed people to live on the streets."

Jones became deeply involved in social justice work, spending the first part of her career working on hunger, homelessness and poverty.

But it wasn't until she learned about the Adverse Childhood Experiences study on childhood trauma that she felt a deeper calling.

"Childhood adversity doesn't happen in isolation. We need to move beyond only addressing one adversity or another and move toward taking a social ecological approach to working with families."

After meeting Center leadership and forging a collaboration, Jones began introducing the Center's science to her network of more than 450 nonprofits she works with as director of Child and Family Systems Innovation at the Alliance for Strong Families and Communities - a national organization dedicated to achieving a healthy society and strong communities for all children, adults and families.

She says the scientific knowledge and emerging research has profound implications for her work and can fuel

new ideas, policies, programs, services and breakthrough solutions to address some of the biggest challenges facing parents, communities and nations. Jones also leads the "Change in Mind Initiative" in the United States and Canada to infuse insights from brain science into the nonprofit humanserving sector, with the goal of determining if such knowledge can transform policies to move the needle on some of the most difficult social issues facing our communities such as poverty and incarceration.

It's not a simple process, but Jones finds a sense of hope in knowing that real change is possible.

"When we learn to be healthy and well, it creates healthy communities and fosters a greater sense of togetherness and unity," she says. "This allows us to be more compassionate and kind towards each other and view our challenges from a position of strength."

Quick Facts

The Center has reached more than 4 million people directly, and some 100 million people through media exposure and speaking opportunities in the past year.

The Center launched its new website, centerhealthyminds.org, with you in mind.

Center Founder Richard Davidson and Scientist Brianna Schuyler authored a first-of-its-kind chapter on the neuroscience of happiness and well-being for the 2015 World Happiness Report. Read the report online at: go.wisc.edu/whreport

Davidson discussed the health benefits of meditation with The New York Times, sharing science and the Center's work with more than 1.8 million people.

The Today Show, reaching 5 million people on average each day, featured the Center's 5-3-1 practice in its segment on happiness last summer. Other notable interviews with Davidson and Center scientists were featured in *The Wall Street* Journal, The Huffington Post, U.S. News & World Report, Newsweek, The Atlantic, and New York Magazine.

IOIN THE MOVEMENT

WORLD HAPPINESS REPORT 2015

Along with well-being in business experts Golbie Kamarei and New York Times reporter David Gelles, Richard Davidson and the Center led a webcast focused on well-being at work. More than 4,500 people viewed the webcast and some 400 people brought the event to thousands more by hosting a webcast watch party at their own workplaces across the country.

Center outreach specialists surprised their students by bringing in esteemed mindfulness Hip-Hop artist, JusTme, to the classroom. The video garnered more than 1 million views on Facebook alone.

Richard Davidson shared the science of well-being with a sold-out audience for National Geographic Live at National Geographic's headquarters in DC.

The World We Make: Well-Being in 2030

A global event on March 8-9, 2016 featured experts and His Holiness the Dalai Lama

Alongside the Dalai Lama and our community, we explored how the world might look roughly 15 years from now if we choose well-being today. How can we decrease the costs related to depression and stressrelated disorders that are projected to double to \$6 trillion by 2030? How can we learn to be happy, to be kind, and to be grateful?

For many in attendance, the concept of disconnection surfaced as a theme. Participating in our highly connected global network makes it easy to feel overwhelmed and disconnected from the relationships and habits that underpin our health and happiness, which is why His Holiness' message of human connection is so crucial.

We came away from the event with a renewed appreciation that there's a need to reconnect with our own basic goodness. We can do this better by understanding how our minds work and how we can rewire and strengthen connections in ways that improve well-being. Imagine how we can begin to reconnect with ourselves, each other, communities, and the world in generous, open-hearted, and regenerative ways...

Watch an overview video of "The World We Make" event at: go.wisc.edu/wwmhighlights





Top: Thousands watched in person and online as a panel with His Holiness explored what we know about well-being and how we can bring it to the world. Bottom: His Holiness met UW-Madison Chancellor Rebecca Blank and discussed the university's role in creating positive change.



With the support of livestream partners National Geographic Society and the Mind & Life Institute, the event reached thousands of people in more than 80 countries.

Dan Harris from *ABC News* conducted a live interview with His Holiness and Center Founder Richard Davidson, which generated nearly 85,000 views on Facebook in the first five days it was shared online.

The public panel, held at the Overture Center for the Arts in Madison, included Soma Stout from the Institute for Healthcare Improvement, Sona Dimidjian from the University of Colorado at Boulder, Richard Davidson from the Center, and was moderated by *ABC News* correspondent Dan Harris.

A Deep Bow of Gratitude to Our Partners and Sponsors

LIVESTREAM PARTNERS National Geographic Society and the Mind & Life Institute

> HONORARY HOST PwC

> > PARTNER Steelcase

AMBASSADOR Ready Set Productions Chade-Meng Tan Jeffrey C. Walker

...and the other 75 sponsors who made this event possible!

Looking Ahead

The Center for Healthy Minds will continue expanding its research and reach to make the world a better place. Below are highlights of many initiatives we're pursuing this coming year.

Advancing the Research

- Design and launch studies to measure the impact of a neuroscientifically informed, digitally-based "Healthy Minds" program in businesses and college campuses
- With federal funding from the Department of Education, complete the Center's research on classroom training aimed at improving attention and emotion regulation for 5th graders and their teachers
- Publish the results of a landmark study supported by the Bill and Melinda Gates Foundation on the impact of video games in helping children improve attention and develop prosocial behaviors
- Launch a novel two-year imaging study to examine early brain » development in autism
- » Advance the Baby Brain and Behavior research project to better understand how early childhood experiences shape the brain
- Start the next phase of research on well-being in midlife
- Begin new research with the Madison Police Department on an intervention to promote officer well-being

Recruiting World-Class Faculty to Broaden Impact

Recruit two new world-renowned faculty members to lead our research in children and well-being as well as women and well-being, thanks to the support of generous donors

Focusing on Long-Term Sustainability

- » Launch a campaign to build capacity and ensure long-term sustainability. Learn more about the Erdman Family Match at go.wisc.edu/ErdmanMatch and the Investors' Circle at go.wisc.edu/InvestorsCircle
- Move into a new facility to enhance cross-Center collaboration and growth





"The Center is a 'Game Changer.' I'm absolutely confident that the work will continue to benefit and become integrated in the standard practices of people and communities everywhere. I am proud to be able to, however slightly, support the Center's efforts." - Richard Chao

"The Center for Healthy Minds is the embodiment of what positive science is all about. Identifying the foundations of health and wellbeing, and then finding ways to promote them in daily living, is the ultimate goal of human sciences." -Kirk Strosahl

"The Center's research, publications, articles and press releases on neuroplasticity have helped me to change my mind, my being and my life. I had been told all my life that I couldn't change my brain or how it worked, but the work you do helped prove this wrong. As a result of knowing it was possible (by reading books from Richie, and articles and research published by you), and with training in mindful practices, my life has gotten much better." - James Slavens

"The work being done at the Center represents the best of what humans are capable of: compassion, generosity, forbearance and love. In a world that seems to be splintering at several seams, the approach toward cohesive mindfulness presents an antidote to much of the world's prevalent cynicism and fear. I feel that in some small way my contribution actually does 'contribute' toward a world that is more mindful and therefore more peaceful." - Peter Kettler

Your Support, Your Words

Heartfelt thanks to all Center for Healthy Minds donors who move us toward a kinder, wiser, more compassionate world.

Learn why Center members care about investing in a better world.

"It makes me feel good to contribute to people who are working on real solutions for a better world. I like that the Dalai Lama has decided to work in collaboration with scientists to promote a more peaceful world. I want to be a part of that." - Mary Haight

Change Your Mind Change The World

"The invitation in this work is that we can all take more responsibility for our own minds and brains by cultivating healthier habits of mind."

- Richard J. Davidson

To learn more about opportunities to support the Center, please call us at 608-308-5324.

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website: <u>centerhealthyminds.org</u> email: info@centerhealthyminds.org