



MIND & LIFE

Mind & Life Podcast Transcript Jyoti Mishra – Mindfulness and Climate Trauma

Original Air Date: April 18, 2024

Retrieved from: <https://podcast.mindandlife.org/jyoti-mishra/>

Opening Quote – Jyoti Mishra (00:00:03): *When we're coping with a disaster, there are acute effects that happen in the first few weeks, and that's really just our coping mechanism. When we think about mental health in the long term—for example, post-traumatic stress disorder—the long-term impacts are really understudied. And to actually improve symptoms, it has to translate beyond what you're doing in that moment. And that's why bringing mindfulness skills to the broader context of this conversation of climate trauma is really important to me.*

Intro – Wendy Hasenkamp (00:00:45): Welcome to Mind & Life. I'm Wendy Hasenkamp. My guest today is neuroscientist and mental health researcher, Jyoti Mishra. Jyoti is Associate Professor of Psychiatry at the University of California–San Diego, and as you'll hear, she's involved in a number of projects around how trauma affects our brains and minds, and how mindfulness and other contemplative approaches can help. One of these is a pretty amazing intervention she developed for foster children. She shares about that and the long-term benefits it had for their mental health, their brains, and their daily lives. Recently, Jyoti has turned her attention to the effects of climate disasters on mental health, and in our conversation she unpacks the concept of climate trauma, which is unique in a number of ways compared to other traumas we think about in psychology. We also discuss our relationship with nature, and how mindfulness and nature-based practices can help repair some of those broken connections.

(00:01:53) I wanted to have Jyoti on the show not only because of her important research, but I also think she's setting a wonderful example in the way she's partnering with communities in her work. As we face big challenges like climate change, I know many of us are struggling with how to respond, and it often feels like our own skillsets might not be relevant. So I loved hearing how Jyoti is bringing her skills as a neuroscientist, along with her passion for engaged and applied research, to help communities in need. She's also developing a course on climate resilience at her university to help empower young people so they can transform distress into collective action.

(00:02:36) We actually only just scratch the surface of all the cool work Jyoti is doing in the area of mental health, so please do check the show notes for more. There's a link there to a wonderful essay she wrote for our Insights Project, which I highly recommend. I hope this conversation makes you think a little more expansively about the many forms of service that are possible. As Jyoti says, even if it's just having more conversations about the topics in today's show. I really enjoyed chatting with Jyoti for this. It's my great pleasure to share with you Jyoti Mishra.

Wendy Hasenkamp (00:03:14): I'm so happy to be joined today by Jyoti Mishra. Jyoti, thank you so much for being here with us. Welcome.

Jyoti Mishra (00:03:20): Thank you, Wendy. So glad to be here.

Wendy Hasenkamp (00:03:24): I'm really excited to dig into your work. It's quite broad in the realm of neuroscience, and then you've more recently been getting into effects of climate change and climate disasters, which is fascinating. But first I'd love to hear just a little background about you and how you got interested in studying the mind and the brain, and then also maybe if there's a time that contemplative approaches wove in for you personally.

Jyoti Mishra (00:03:48): Yeah, absolutely. I grew up in India and actually I grew up on a campus of a hospital and my dad's profession for a living was to treat brains, and literally—he did brain surgery. He's now retired, but he did it with these little catheters, they're called an interventional procedure, and he actually helped pioneer some of that work. And in India, living on the hospital campus, I got to see the patients, I got to see how they improved. It almost felt miraculous. And that got me interested in how our brain controls us, in terms of our day-to-day activities, and how do we keep it fit and how do we stay healthy? And so there was a very early exposure to thinking about the brain in general, and I over time just got more interested in learning aspects of how the brain codes information, and that's what brought me to the United States for graduate school. We didn't have a neuroscience major, especially the intricacies of systems and cognitive neuroscience, in India at the time. (That field has really expanded. There's so much more happening internationally in scientific work, which I'm really grateful for and happy to be part of collaborative opportunities around the world.) So that's sort of how I got started with just thinking about the brain. A lot of my graduate education was basic knowledge—learning and figuring out how do we measure the brain, how do we interpret signals of the brain and how they code cognition, our thoughts, and so on. So just the basic aspects. But after I graduated, I was very interested in applications. Just given my background where I grew up, I just saw such a great need for applying new neuroscience methods, new tools to serve mental healthcare, that application was where my heart drove me to, and so that's the work that we do.

(00:05:58) Then your second question was about contemplative practice. I would say I'd characterize myself as someone who's been driven by what my intellectual pursuits have been, which is what brought me to the United States. But when I got here, I was quite surprised that I actually had a period in the first year or so that was... just very much a long period of a depressive episode. It took me a while to actually figure out why I would feel that way when I was pursuing the life that I wanted to pursue, in terms of my intellectual needs. And that is the point in time I realized that it was a change in community, it's a change in culture, and so many things around us that change, and that can be very stressful. And at that time, I was introduced to contemplative practice and mindfulness and breath-related practice.

Wendy Hasenkamp (00:06:57): So that wasn't a part of your experience growing up in India?

Jyoti Mishra (00:07:00): No, not so much. Even though in India, contemplative practice exists a lot, it's so much in the background. It's not so much instilled as part of your daily learnings—although schools have changed that now that yoga and mindfulness have become a little bit more part of the curriculum. But when we were growing up, it was very much academic pursuit focused. So I got introduced to these practices here in the United States and had some great teachers, then continued to learn. And pretty much every time I've had a transition in life, whether it be a job or moving places or having children, I've always felt that I need something more to ground me. And I've built on different kinds of contemplative practices over time. And about a decade ago, I've just felt very fortunate that I got the opportunity to

start to integrate that in my own research work. And that's definitely very rewarding, to take what you've learned and help to disseminate it to others. So yeah, that's been my journey.

Wendy Hasenkamp (00:08:09): Oh, that's awesome. That's really cool to hear how those have woven together. So let's talk for a while about your work now, bridging into the climate space. Some of your recent work is focusing on exploring the effects of climate disasters on people's mental health. And so first, maybe you could lay the landscape a little bit about how much disasters have increased and what that is looking like, trends and impacts and things like that.

Jyoti Mishra (00:08:41): Yeah, absolutely. So it's undeniable that climate change is... we're in the middle of it now, and that there is a huge human caused contribution. So we live in the age of the Anthropocene. And in the last 30 years especially, there has been exponential warming and we're about to cross the 1.5 degree threshold in the 2030s. If we're able to allow for good mitigation steps and then climate adaptation steps, we can limit it in the 2.7 degree ballpark. But yeah, it's going to be a lot of collective action coming together to change from the accelerated warming curve that we're on. And there's a lot of work needed for bending the curve and the field as such needs all of our efforts and all of our minds and our innovations together to help solve the problem.

Wendy Hasenkamp (00:09:44): And you live and work in California in the West Coast of the US, where there have been many, many fires and a lot of increase in fires. I saw a statistic that there's like a thousand percent increase in the last 30 years in fires. So, is there more background that you want to share about what we know about climate disasters and mental health? I know there isn't that much known...

Jyoti Mishra (00:10:06): Yeah, I think people are starting to do work. The study of disasters and how it affects psychological health has been around for a while. That itself is not new. What we understand uniquely is that the wildfires that are happening, say on the West Coast on an annual basis now, are very much related to the climate warming curves. The quote that you said that there's a thousand percent increase in the Western wildfires is partially related, and very much aligns with the warming that we've seen over the past 30 years—especially the human caused warming that we've seen over the past 30 years. So those curves exactly align with each other. And so for the more recent wildfires, it's better to say that these fires have had a greater anthropogenic contribution. They're more climate change accelerated fires than any disaster that would've happened at any other point in time.

(00:11:12) And so in that context, we ask unique questions because these fires actually happen more than once. They happen on an annual basis, they're affecting the same communities again and again. And then it's not just limited to fires, there's floods. And so there's repeated impacts from different kinds of climate stressors that are happening. So we think about an exacerbated impact on mental health.

(00:11:40) So what's important is to understand that when we're coping with a disaster, there are acute effects that happen in the first few weeks. And that's really just our coping mechanism, our stress response, our hypothalamic-pituitary-axis in the brain, just responding to a calamity and trying to rebuild and trying to get back to its feet. And that's actually a good thing, because it helps us to really rehabilitate ourselves after a disaster. And it would be an anomaly to not have a stress response right after. When we think about mental health in the long term—for example, post-traumatic stress disorder as traumatic symptoms that have lasted for six months or more—the long-term impacts are really understudied. And at the same time, we need to highlight them more to understand that the communities are hurting beyond the time that the fire's been taken into control, the smoke has left the

air. But even six months to a year out, the symptoms from the disaster, whether they be traumatic stress-related symptoms or depression and anxiety, they're still ongoing.

(00:13:04) So our work that was in the Chico area, which is part of this county, Butte County, which is one of the most vulnerable counties in California because people live on these wildland-urban interfaces that are very close to the forest, so they're vulnerable to forest fires. It's interesting because a lot of the Californian population, actually more than 50% live at that interface. So more than 50% of the Californian population is vulnerable to climate risk. In other states there other kinds of climate-related dangers as there are across the world from say, floods and so on.

(00:13:47): So the long-term impacts are something that we need to pay attention to. And there are cases, say for example with floods in the UK, they've done studies even three years to six years out, and still observed higher mental health impacts in that population. So there are studies of long-term impacts that are there, but the collective import of these studies needs to be understood better. And that we're living in a time of a climate change-driven mental health crisis, that needs to be highlighted.

Wendy Hasenkamp (00:14:27): Yeah, I really appreciate you pointing out that long-term effect that we've studied so much less. And it makes sense—the immediate disaster has impacts, but often people's entire lives are destroyed. Communities need to be rebuilt. And so of course that is going to be continually just causing more stress. So yeah, it makes sense that these are very long-term impacts that we would see. I wonder too, if you think about more and more of the population is experiencing these disasters, ostensibly having then these mental health impacts, and that probably plays into potentially a feedforward cycle of being even less able to respond in the ways that we need to respond to this larger crisis, perhaps. I don't know if anything is known about that, but I'm just imagining that kind of cycle.

Jyoti Mishra (00:15:20): Yes, I think we can imagine this catastrophic cycle. But what I've found from working with the communities that really are affected by these disasters is a very keen sense of gratitude for what they have, and also a keen sense of inviting collaboration about how others that are even outside the community can feel like community members contributing to solutions. And there's this very strong sense of survival and resilience, that is partly because there's this collective struggle that they're all actually trying to come up with solutions together.

(00:16:14) The problems with mental health are beyond climate. Already mental health is a crisis around the world. If we just take the case of depression, there are 300 million people around the world who suffer from depression on a yearly basis. There's time lost to productivity and to economic stability. There's all these costs associated. And the systems tend to fail us, because when we look at statistics of mental health expertise, pretty much around the world it's one person who's an expert serving a population of 100,000. And that is not a statistic we want to live by.

(00:16:59) The other problem is that a lot of the high specialty mental health care that relies on medications, say for example again if we take the case of depression, the gold standard antidepressant medications only help in 30% of cases. That is, 30% of cases will have full remission of illness, whereas the rest continue to try other options. So given this scenario, the communities and also top down from the government, there's a sense that there's a greater need to recognize what our community support can do for each other, and how can we support more lay counselors to come up with solutions to support during times of crisis. There's a great model in Africa where there are grandmothers serving on a bench—people come and talk to them about their psychological distress needs. It could be in the context of climate, people could come and talk about anything. But the core idea is that mental health is served more by the community than by any expertise, at the present point in time.

[\(00:18:14\)](#) – musical interlude –

Wendy Hasenkamp ([00:18:42](#)): Let's chat some about the study you've been doing looking at survivors of the Camp Fire in California. Can you describe how you came to embark on that study, and some of the things that you found?

Jyoti Mishra ([00:18:55](#)): Yeah, absolutely. I've been interested in climate change and in sustainability from a personal standpoint, engaged in pro-environmental behaviors for a long time, but that's a personal impact and I wanted to move beyond that and try to integrate it as part of my work. And how it all started was actually sort of serendipitous when my son was in first grade around 2018, and he came home with a flyer to campaign for funds for this Camp Fire that happened in Butte County. And the region of Paradise was destroyed at that time, and Chico is within 10 miles of Paradise. The closest academic institution is over there.

Wendy Hasenkamp ([00:19:44](#)): I just thought of one thing. Could you say why it's called the Camp Fire?

Jyoti Mishra ([00:19:47](#)): Of course. So all of these are dependent on where they localized from, so there's all sorts of names. The same area has been stuck by different names. So there's the Dixie Fire, but this just happened to be the Camp Fire. A campfire is not how it started, but that's what the fire was called. And it was in this Butte County region, and it's still continues to be the deadliest fire that California has suffered from in terms of the number of lives lost and 150,000 acres of land that was destroyed in the fires. Almost a hundred lives were lost and 50,000 people evacuated. So just in terms of the sense of loss, it was one of the most marked fires that happened in the region.

[\(00:20:38\)](#) Our work with the community partners and with the academic institution in the region showed that the post-traumatic stress and the anxiety and depression that we were seeing was almost three times more than what we'd see in a matched control population that has not suffered from the fires in that same period of time. And beyond mental health symptoms, because I'm a neuroscientist and some of my tools allow us to understand mental health in slightly greater detail, I wanted to go in and see whether there were impacts on cognition and on biology. And what we found was that aspects of cognition, especially related to how people sense distractions in their environment... So it's a very core process of how we go about our day-to-day lives. We always have a focus of attention, what we want to act upon that's goal relevant. And there are lots of things happening in our environment that are irrelevant to us at any given moment. This includes our thought processes, but also sounds and visuals coming from our environment. And it turned out that individuals who've been exposed to the fires were having trouble dealing with distracting information, and suppressing that distracting information.

[\(00:22:07\)](#) There's some evidence that comes from PTSD literature to help understand this, that after disaster, especially when there are long-term mental health symptoms, the brain can go into this hyper-attentive state and sort of this hyper-aroused condition where we're unable to parse where the threat is coming from. It could be from... Even safe sources may seem threatening. And even though if you were to go through the entire cognitive process of, "Oh, actually the smell of something that's on the stove and it's hot is not threatening," the first response of the brain is that, "Hey, this could also be threatening." And so underlying that, we also saw that the brains responded differently—the processing of information in the brain was such that people who are exposed to the fires had more aroused brain function, like heightened activity, especially in the frontal parts of the brain that control our behavior. You're sort of in a constant scanning mode, "What could be threatening?"

(00:23:24) So all of this put together, we now understand in the realm of climate trauma. And it's important to provide labels that are beyond what any one mental health disorder can tell us because it's not just PTSD, it's not just anxiety, and it's not that climate trauma would arise if the climate disaster wasn't there. So there's this very important context—that it happens in the context of climate and the connection that we have with the environment around us has been distorted, has deteriorated. And therefore everything in our environment is threatening to us in that condition. And therefore it needs new understanding and terminology. It can definitely benefit from what the field of psychiatry and psychology and neuroscience that has come before us, but it needs its own dictionary and understanding as well.

Wendy Hasenkamp (00:24:30): Yeah, that's really interesting. So just to make sure I'm understanding, this kind of umbrella of 'climate trauma' is different from other forms of trauma that we've thought about in psychology and related fields because it is related so directly to our environment. And then the kind of connection that we have with the environment has been broken, or all of a sudden the environment is now a threat. Is that the layer that feels different now?

Jyoti Mishra (00:24:57): Absolutely. Yeah, I think you understand that really well as you put it there. Our connection with the environment has changed. Climate trauma also encompasses this awareness that it happens in regions and in communities that are already vulnerable in some regard. When we think about the global context, we think that 3 billion people of the total population of the world actually lives in climate-vulnerable regions. The rest of us live in less vulnerable regions. And so when we think about climate trauma, the impacts are more within these vulnerable regions that are more prone to disasters... because like the forest fires, if you're living right next to the forest, yes, your house has more risk to be burnt down. And then we start thinking about why do these people live in these regions? It's because they do not have enough resources to live in more-

Wendy Hasenkamp (00:26:06): Safer regions.

Jyoti Mishra (00:26:07): ...safer regions. And then we bring about climate justice and issues that are also intertwined with socioeconomics and poverty. And so climate trauma amplifies these other issues that are happening that are very much related to the socioeconomics and poverty status as well.

Wendy Hasenkamp (00:26:31): Yeah, I really appreciate you raising that. It's also making me think of some work... Have you also examined this concept of ACEs, adverse childhood experiences? So those are often also more common in these communities too, right? Can you share a little bit about your work in that area?

Jyoti Mishra (00:26:49): Yeah, absolutely. So for example, in Butte County where we started to do this work, 70% of the population has adverse childhood experiences, and it's the highest rate in all of California's counties. And it comes with the poor climate score and the poor scores in terms of socioeconomics and poverty, which is again, it's a very high ranking community in terms of poverty as well.

(00:27:20) So like you mentioned, Wendy, the ACEs, which are adverse childhood experiences, how we experience those traumas. And basically ACEs are described by both a sense of neglect—so when you have had emotional, physical neglect from family, immediate family—and also abuse, which is more proactive, which can be in emotional, physical, or sexual realms. And so both neglect and abuse are part of ACEs. And together there's a huge literature showing that ACEs, which are these traumatic events or

experiences that one has suffered during childhood years, then can impact psychopathology development later on in time. So there's greater risk of developing mental health disorders, and not just mental health, even physical health disorders related to cardiorespiratory illness, obesity. All of these cases have been linked to higher rates of ACEs that then also contribute to earlier mortality. So efforts that we can have greater awareness of ACEs and more trauma-informed care in communities are very important.

(00:28:45) It's interesting because my work actually first came in the field of ACEs before it came into studying climate and the impacts on mental health. I saw that as a natural progression because when we look at the individual, we look at their immediate environment, the family in which they've grown and what it has been like. And when there's adversity in that environment, we were looking at impacts of that adversity on the brain already. And then it seemed like a natural extension to say, "Okay, well this is your immediate family, but how about what's happening in your community?" And in communities that I work with, climate change was a big distress signal that was going on, beyond what's happening in the family.

(00:29:36) My work in ACEs has partially been related to understanding how it contributes to increased risk—how it changes brain functioning to increase risk and how we can predict that risk early on. But it has also been in the realm of interventions. And this story goes back to 2013, there was an organization for children's care, and they have a children's foster care home in my hometown in Delhi, but also in other parts of India. They serve about 800 children now. And it's a children's care home—clearly children in foster care have had a traumatic history, and this home was a place where they were being rehabilitated. They reached out to me to say, "Can we look at some of the neuroscientific applications that you're making, and could they benefit our children in any way?"

(00:30:41) And at this time, I hadn't had a community partner come up to me to ask a question like that. And I also knew that this was a vulnerable population, and so I wanted to definitely get involved because I was passionate about applying what my learnings were, but also apply it in a cautious way because we didn't know how we could really help adolescents in this age group. So there's some work that's been done where in children with the ACEs, if there's rehabilitation done in the first infant years of life, then you can gain back function. But these, we were talking about children who are eight to 15 years of age, and they've had much adversity in their life.

(00:31:26) What we decided was that we were going to provide trainings in inner attention skills, which are related to mindfulness, and building attention to breathing over time, and that kind of practice. So there's inner attention skills. And then another group would participate in outer attention skills. And this was something that was very en vogue in the field. It still is for some researchers who do that kind of work, but it was about creating these flashy game environments on the screen where there's levels, and you can intricately attend to certain things on the screen that are animated, and not pay attention to other things—just like a video game environment would be. But it was about training external attentional skills. And both of these we provided in digital formats to the children over a six to eight week program that the children went through. And it was scalable in the sense that we could do it in these community homes. We trained the community workers to help monitor these trainings. It was a big effort where not just academics, but then my first foray into doing community work, where the community partners trained in neuroscience methods too.

(00:32:50) What we learned from those studies was that there was an overwhelming benefit of developing inner attention skills. The parts of the brain that are involved in attention, cognitive awareness of our feelings, of what's arising in our body, our sensory awareness of our bodily signals—

that circuit is weakened in children with adverse childhood experiences. And we've shown that not just from studies in India, but we've had access to large databases in the US with 500 children undergoing magnetic resonance imaging. And we've shown it with that database. It's been also repeated with a 10,000 children's database in what's called the Adolescent Brain Cognitive Development, ABCD study. That's one of the biggest funded NIH studies of child development. But basically it showed that that circuit is weakened when there's childhood adversity.

Wendy Hasenkamp (00:33:55): That's really interesting, and it's bringing up a question for me related to the kind of mindfulness, or that inner attention training that you brought up. I guess in a way it makes sense that the brain would dissociate a little bit from bodily signals maybe, if you have experienced a lot of trauma and threat, because maybe it's so overwhelming or it becomes too much to process. I don't know. I'd love your thoughts on that, but also I'm curious if you saw in your studies... I've heard that oftentimes people who have a history of trauma can have sometimes trouble with the breath focus and inner focused (like on bodily sensations) types of practices because it brings up a lot of anxiety. So just curious of your experience with that.

Jyoti Mishra (00:34:42): Yeah, I think there's definitely a case for personalization, that different mindfulness practices or different... we can just call them inner resiliency development practices, and they come in different forms for different people and also different points in time. Even personally, I can relate to that, when I am very much interested in mindfulness practice and going about it on a disciplined day-to-day basis. And then there are really other times in my life when I am all about physical activity, all that I care about is just sweating it out and... Literally, I do kick boxing, so I box the demons out. *[laughter]* So it's just different times in our lives and for different people it can be different things. And different contexts, right? So when I have a broken toe, I can do a certain set of things versus other things. So all of these things can change how a person relates to a certain practice, and also what their prior exposure with that practice has been.

(00:35:53) Our work, when we work with kids and also adults, there are different levels of reception. At the same time, we try to create practices that baby step people into the practice itself. You're not going into it more than a minute at a time. And then you could take a break, and then go into the next segment, and think about, most importantly, how the practice is not just about breathing, but also about imbibing that present moment awareness into other parts of your life. So I think overall we've had a positive experience. We continue to do trials not just in children, but also in adults.

(00:36:40) And it's interesting when you bring up, how does mindfulness really help with an experience like a trauma experience? Or again, in the case of the climate disasters that we were talking about earlier, we found that people who scored better on mindfulness skills had better well-being. They had less PTSD or depression or anxiety symptoms.

(00:37:05) So it's not that mindfulness is... It's not like I want to be mindful of the disaster and relive that disaster. It's actually helping you disconnect from it in a way that you say, "Okay, this traumatic thought is coming to me, but in this moment of awareness, I have to let go of that thought." And focus on, say, sensing your bodily signals or your breath. Or this effortful practice that I'm doing to let go of this other negative emotion that's coming to me is helpful. And that's just from my personal experience of how I've felt the emotions when they come to me. I've personally not suffered a climate disaster, and I've also fortunately had a great childhood. But every time, like I said, when we have a need for mindfulness, if we're going through a stressful experience, things come up in our mind and that's what we're trying to work with and let go. So just my experience of dealing with whatever stressful experience I'm dealing

with is that we're connecting with ourselves while disconnecting from the negativities, and also trying to be nonjudgmental about how those negative conditions or contexts influence us.

Wendy Hasenkamp (00:38:36): Yeah, it seems like also a part of that could be, particularly in the case of trauma... So much of mindfulness, you begin to see your thoughts as thoughts and as a bit of a storyline that your brain is creating and your mind is creating. So when you're talking about that disconnect, I feel like that can be useful in the sense that you can see that that's just a thought or that's just a story. And actually in coming back to the present moment where there is safety (hopefully), you can start to repattern then around the reality of the safety that you have now.

Jyoti Mishra (00:39:11): Yeah, absolutely. I think you say it really beautifully, and it's exactly how it feels. And what we measure in the brain are just signatures of that. We measure that the systems that are important for attention and cognition and feeling of our sensory processes, those systems are strengthened. And the other brain systems that are engaged in rumination or mind wandering, those systems are weakened. And that's what happens with these practices. And I think that's beneficial throughout the life course.

(00:39:53) Just like for... so these same children who had the weakened cognitive systems, the brain connections that were weak in the context of trauma, those connections were strengthened by the practice, when we look at what happens after the practice. And it doesn't happen with training of external skillsets. That does not translate. It's the inner practice that translates. And so I was very intrigued by those findings, and we set up the study in that way because in the beginning, I really did not think that it would be so one-sided, the results would be so easy to interpret. It hardly happens in scientific work that it's one way or the other. We're always writing, "Maybe it's this way, maybe it's that way." But the extent of changes with the inner practice were just so much more dramatic than with the outer practice. Even though we knew that the children were engaging equally and they were doing all their sessions, it didn't translate much to the neural improvement or the cognitive or mental health benefits.

Wendy Hasenkamp (00:41:08): So did those changes in the brain networks that you're measuring also correlate then with changes in their lives?

Jyoti Mishra (00:41:15): Yes, absolutely. One thing that happens with children who've had adverse experiences, when they reach about middle childhood to adolescent age, many of them can get a diagnosis of attention deficit disorder (ADD). And if one doesn't know the history of the child, then one would think, "Let's prescribe medications because we want to calm down the hyperactive state." But once trauma-informed care comes into play, that this is actually a symptom of trauma and not just the child's biology in that moment, then there are more unique therapeutic processes that can help the child, that are different from providing ADHD medications.

(00:42:02) And so when we look at those attentive behaviors and hyperactive behaviors, those were reduced in the long term. We looked a year out and the group that trained in the inner skills benefited a year out. Even after the two-month training... after that, they did not have any of the digital tools available to them. But when we asked the children, they all said that they felt that they could deal with stressors better and that helped them in their daily lives to pay better attention, and it was calming.

(00:42:39) So it's really about how we think about translating new interventions and new learnings to what's happening in our daily lives. And that's why we want to improve mental health care. For it to actually improve symptoms, it has to translate beyond what you're doing in that moment. And that's

why bringing mindfulness skills to the broader context of trauma, and this conversation of climate trauma, is really important to me.

[\(00:43:10\)](#) And that's something that resonated with the community partners as well. Going back to Butte County, one of the groups told me about this really nice ecotherapy work that they were doing. And so this is eco-mindfulness, which is mindfulness in nature. Here again, coming back to the context of the climate, it's the connection with the environment that has been destroyed or diminished, and changed in ways that now it's stressful even when it could be safe. And so how do we change this connection to the positive again?

[\(00:43:53\)](#) What was interesting to me was that this was being driven by learning mindfulness in the context of a natural space, and in a community collective space where people come together within the safe months, in the forest, and experience the sense of the forest in a positive way again, to feel its benefits. And so that was interesting because it's almost like exposing yourself to the environment that has caused the trauma, but now... It's like PTSD exposure therapy, but you're learning mindfulness skills within that framework.

Wendy Hasenkamp [\(00:44:35\)](#): Right. In a context that's safe now.

Jyoti Mishra [\(00:44:36\)](#): Exactly.

[\(00:44:36\)](#) – *musical interlude* –

Wendy Hasenkamp [\(00:44:56\)](#): Something about the way you're talking about this connection between humans and the environment or nature, and how that gets ruptured with these disasters... There's a lot of emphasis in climate work and thinking about the mindset shift that has to happen, and how we need to see again that we are part of nature, and almost expand our sense of self to include our environment in some ways. So then I'm thinking there's this push to embrace nature as part of ourself, or put ourselves in nature, but in the context of disasters, it's almost like then that is becoming a source of threat. And if you've now included that in your sense of self, now even your self is a threat. So there's just a lot of complexities in there. I don't know if you have any reflections, but I find it really interesting to think about how we relate to nature and the sense of self.

Jyoti Mishra [\(00:45:55\)](#): Yeah, I think that's a fascinating question. I think partially it's to our benefit (this is personal opinion more than anything else) to think about the nature that's around us really being part of us in the sense that... Even in the context of the ecotherapy interventions that are being developed, the reconnection with nature is as much about healing ourselves as it is about good environmental stewardship. So part of the process is also learning about, how can we care for the environment that's around us better? And why we would want to care about the environment around us is it's actually part of ourselves and our being and our family is why we tend to it, like we tend to the plants in our garden. And it's also present all the time. So having a positive connection with nature that's around us all the time is much better than living always in fear of what this nature could do to us.

[\(00:47:04\)](#) And so it actually has other pragmatic benefits as well because when, say, we learn from Indigenous practices about controlled burns and protecting the burn scars. And the Indigenous have had a long history of preventing forest fires through the controlled burn process. And sometimes we then think about fires as 'good fires' and 'bad fires.' So the fires that go out of control are bad fires. But all of this education comes in this natural context. And the ecotherapy or the eco-mindfulness programs are starting to have these discussions because they're pragmatically important for the community. As

people see that there's some fire happening in a controlled way, there's a controlled burn happening in the area, that that's not alarming, that's not triggering the traumatic responses. And that can also be good. So understanding that, and our role in stewardship and sustainability in the environment that we live in. We don't live on Mars. We live on Earth, in nature. And so it's to our benefit to understand that positive connection. So I think the effort is in that direction.

[\(00:48:27\)](#) And like we were talking about mindfulness itself, that it's not that if I'm more mindful this event is going to impact me more. It's I'm going to be able to engage or disengage with this event in an objective way. And that's what's important that I can then not let emotions attach to this event in a way that I don't want them to—to make it more traumatic than it actually may be for myself, or make the traumatic feelings last longer. So I can train my cognitive systems, my brain to say, "Okay, this is what it was, and I will frame it as that." So I want to be in control of my story rather than the event deciding it.

Wendy Hasenkamp [\(00:49:20\)](#): Yeah. You've talked a little bit too about how mindfulness can integrate top-down and bottom-up systems in the brain. Can you share a little bit about that perspective?

Jyoti Mishra [\(00:49:33\)](#): Yeah. When we think about how our brain processes information, the bottom-up is all the sensory experiences that come at us—the audio and the visuals and the touch and all our five senses and how they're putting forth that information. That's the bottom-up processing. And it can always be salient. So you know, if the bell rings, you will go see who's at the door. It can always interrupt what you're doing and become salient.

[\(00:50:07\)](#) And top-down is our control processes, especially from the frontal part of our brain, but also from other regions, such as what's called parietal cortex. Between the back of the brain and the front of the brain, the parietal cortex also exists. So the top-down part of the brain is controlling what we choose to pay attention to, what we think is relevant for our goals, and also deciding what needs to not be made salient. And in that moment when we consider climate trauma again, or any kind of traumatic experience we've suffered from in the past, it's the strength of the top-down system, the connections in those parts of the brain, that are helping us choose the way we want to process our trauma.

[\(00:51:06\)](#) Any given experience, the experience of being in a wildfire, it can feel apocalyptic and life-ending. Or do we frame it as, how will I help my community survive from this, and what are the skills that I bring to contribute to this? Which is a very positive and resilient perspective. And that perspective, again, stressing the importance of social connection and community action, it's very much driven by how strongly you feel the sense of community, and how others around you are shaping your point of view. How others in the community are reacting to that disaster. What is their response like? And so there's parts of our brain that are involved not just in top-down and bottom-up, but there are parts that are involved in relating to others—what's called theory of mind. Can we feel what others feel?

[\(00:52:14\)](#) All of those are interacting to produce our interpretation of any given experience. So there's objectively how something looks and feels, or the sound that it produces, that we'd measure just by taking a picture of it or recording the audio signal, versus how our brain's processing it is very different for me or even for you. There might be very different experiences. So yeah, it's about shaping this bottom-up, and letting through what we want to let through in a way that we want to see it—especially for negative experiences that can have a tendency to go through our automated systems. So the fear response systems, they're very much cued towards survival, and anything that could be threatening or have a threatening cue will trigger that limbic system and then create this stress response. And so, can we strengthen our top-down systems in a way that we don't let it trigger the stress response, and experience it differently?

Wendy Hasenkamp (00:53:29): Yeah, I really appreciate all this nuance you're bringing to thinking about all these different brain systems. And I'm thinking too about with the bottom-up, you were saying that's the sensory processing from the world, and also from our internal bodily signals like we were talking about before. So that's another kind of bottom-up signal coming from our own bodies that we can then become aware of, and like you were saying, with the top-down, start to integrate those signals, which could be related to threat or fear responses or things like that, but integrate them with different contexts. And then you brought in this awesome lens of the social connection and how that's also shaping... So it's not just one brain, it's all these brains and minds working together to shape each other. So I really appreciate that.

Jyoti Mishra (00:54:21): Yeah, it's very important that we think about distress, especially climate-related distress in this collective context. It can be very distressful, depressing, anxiety provoking when we think about ourselves and the state of the world that we live in, and whether things will be better. And to think that we have a role to play in that process, but the burden is not on us. The burden is collective. And actually being involved in a collective process and being socially engaged in work that is within whatever context that brings a sense of community to you—whether it be a climate context or another context—many studies have shown that that community engagement itself is mentally therapeutic. So when we think about our surgeon general saying that this country has a loneliness epidemic, and part of those solutions are greater engagement and conversations with our community. And that is more positive for our brains than a lot of other things that we can do. Or even reading or educating ourselves about climate change—more than that, even just having these conversations—can be very positively impacting.

Wendy Hasenkamp (00:55:48): Yeah. You were just mentioning educating ourselves about climate change, and that's making me think of your work through the University of California. You've co-founded the Climate Change and Mental Health Initiative. Can you share a little bit about the goals there and that work?

Jyoti Mishra (00:56:05): Yeah, so I'm very excited to be part of the Mental Health Initiative. It is led by myself and Dr. Elissa Epel, who's also affiliated with the Mind & Life Institute, and a very learned professor and has a lot of expertise in psychology, and passionate about climate change work. And we want to help create a 'distress to action' model, and greater empowerment, especially for our youth. And we believe that at this point in time, we can do this by having an actual course framework where we are able to teach about the psychological aspects of climate change. And especially leaders in the field, people who are really at the forefront of the climate movement—how they think about their work, how they came about their work, what are the key points of their work, and what they want students to take away.

(00:57:11) So this is going to be a University of California-wide course that we are preparing for in the spring of 2024. It's a flipped classroom course so there's a lot of video learnings, great learnings from people from the forefront of climate change work coming from these video lectures that will be presented over the 10 weeks of the coursework. And after the course is made available to the UC and across California (we hope that in the first cohort, we will have 400 to 500 students enrolled this spring), after that, we hope to find ways to make it more widely available to others as well.

(00:57:53) This is not a course where you're going to learn about the objective findings about climate change. Actually, a lot of universities are starting to teach that, and learn about the natural sciences and other ways that the climate is affecting the environment. But we find that there's a great need from

students to understand what their own role is and how their own personal distress can be answered. And we feel that creating this community where we are learning together from the leaders and visionaries in the field, but also taking part in climate action projects, which will be a core part of the course. And the third core element of the course is mindfulness learnings. And so together, we'll see how it shapes up, we'll evaluate it scientifically, but that's one way that we want to see that climate education can evolve beyond providing just the knowledge of how the climate is impacting our environment. So trying to see how climate resilience can be fostered.

Wendy Hasenkamp (00:59:03): Oh, that's so great. I really appreciate your story and how you've worked so much to integrate your skillsets and your interests and passion into community-based work and applied work, and work on the forefront of climate change. I think it's an excellent role model because I know so many people want to do something to help, but they don't feel like their work fits. I just think it's beautiful how you've extended yourself into the communities. As we're wrapping up, is there anything else you wanted to chat about that we haven't touched on?

Jyoti Mishra (00:59:36): It was a really delightful conversation. We went to a lot of topics. I would just say that there's lots to learn in this field, and that there's really a need for collective involvement in climate change work, in understanding psychology and mental health if one is an expert in that. But also for people who are listening, having community conversations, whether it be about climate change or whether it be about mental health, and how we can be a support for others. Having this context of service that's beyond yourself—whether it be to others, maybe it's even a person in the family or in the community, or even the nature that's around you, which comes from the eco-mindfulness point of view—I think fostering that sense can really be beneficial for our well-being. And to think that we all have some contribution to make is important.

Wendy Hasenkamp (01:00:42): Well, Jyoti, thank you so much for taking the time and sharing all this wisdom with us. I've really enjoyed this conversation and appreciate you.

Jyoti Mishra (01:00:50): Sure. Absolutely, Wendy. It was so fun.

Outro – Wendy Hasenkamp (01:00:56): *This episode was edited and produced by me and Phil Walker, and music on the show is from Blue Dot Sessions and Universal. Show notes and resources for this and other episodes can be found at podcast.mindandlife.org. If you enjoyed this episode, please rate and review us on Apple Podcasts, and share it with a friend. And if something in this conversation sparked insight for you, let us know. You can send an email or voice memo to podcast@mindandlife.org.*

(01:01:27) *Mind & Life is a production of the Mind & Life Institute. Visit us at mindandlife.org, where you can learn more about how we bridge science and contemplative wisdom to foster insight and inspire action towards flourishing. If you value these conversations, please consider supporting the show. You can make a donation at mindandlife.org, under Support. Any amount is so appreciated, and it really helps us create this show. Thank you for listening.*