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Photo courtesy of Keith Weller

America's Brain Gain

Immigrants at the Frontier of Neuroscience

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When one thinks of the American armed forces, the image conjured is likely not that of a roomful of soldiers practicing mindfulness meditation together. Thanks to the STRONG Project, though, such scenes are indeed reality. Led by Indian-born Amishi Jha, the STRONG Project is studying the effects of mindfulness exercises and their impact on working memory, attention, and emotional regulation.

The STRONG Project, which stands for Schofield Barracks Training and Research on Neurobehavioral Growth, trained approximately 200 soldiers in mindfulness exercises for eight weeks before a 19-month deployment in Afghanistan; soldiers were encouraged to continue practicing daily while deployed. The soldiers' levels of memory, attention, and other variables were evaluated before and after deployment using computer-based exercises and brain wave recordings.

Although the results of the study have not yet been published, the data collected thus far is promising. Funded by a four-year, \$1.72 million grant from the Department of Defense, the project aims to find ways to protect the psychological health of soldiers through mindfulness training, both on the battlefield and off. "Attention, working memory, and emotional regulation are susceptible to being degraded when we're under high stress," explains Amishi, which, for soldiers, is when they need it the most. With the increase of post-traumatic stress disorder amongst military personnel, finding ways to alleviate psychological suffering has also become a priority for the Department of Defense.



Amishi studies the effects of mindfulness exercises on the brain, a new but burgeoning field of study.

The STRONG Project is one of the most prominent examples of studies on mindfulness training, a relatively new area of focus in psychology and neuroscience. "Mindfulness is a mental mode that has to do with paying attention to present-moment experience without reactivity and/or having an ongoing story and interpretation of what we're experiencing," says Amishi.

"Think of the brain as an exquisite time-travel tool," she says. "We can go to the past, we can go to the future, and it ends up that we spend a lot of our conscious experience in the past and the future instead of actually in the present moment." Mindfulness exercises, which can take the form of attention to the sensations of breathing or walking, or guided body consciousness exercises, train the mind to remain anchored in the present moment instead of

being “hijacked into time-travel mode.”

Although mindfulness has traditionally been more in the realm of spirituality than science, Amishi’s work, and that of other scientists, is beginning to corroborate the hypothesis that mindfulness exercises may have physical effects on the brain that can be observed—much like the effect of physical exercise on the body. Brain-imaging tools are showing that areas of the brain that deal with attention, awareness of surroundings, and emotional regulation appear healthier and stronger in longtime meditators.



In partnership with the Dept. of Defense, the STRONG Project finds ways to protect the health of active combat soldiers, both on the battlefield and off.

Given the emerging evidence of these benefits, Amishi hopes that her studies will help bring about a cultural shift in the way that such exercises are perceived. “Nobody would ever argue now, in this day and age, that physical exercise is good for the body,” she says. “The technology-driven, 24/7 kind of lifestyle and culture that we live in now begs for quiet, calm, and clarity. The mind, just like the body, needs to be exercised each day to stay in optimal health.”

Amishi herself first took up meditation 10 years ago as a result of feeling overwhelmed; at the time, she was teaching a full course load as an assistant professor at the University of Pennsylvania, honing her research focus, and raising a young family. The effects were so immediately powerful that Amishi felt compelled to study them: “From my subjective experience, the tension really felt like it was changing,” she recounts.

In her studies, though, Amishi has taken care to be as objective as possible. Although mindfulness has become a hot topic in the last five years, hardly any of her colleagues in neuroscience considered it a suitable area of research when Amishi first started investigating. “Within the academic climate, it was not really—and I would say that this is still the case—well-accepted,” Amishi says. “But we’re trying to be as rigorous as we possibly can, to have the appropriate controls, and to have very detailed manuals in what we’re training. Then, carefully, using behavioral measures and neural measures, we track what happens.”



Amishi’s work, and that of other scientists, shows that mindfulness exercises may have physical effects on the brain.

Now an associate professor at the University of Miami, Amishi is finding more and more scientists who are willing to hold mindfulness up to scientific examination. When she first started, she had only one colleague whose work she could refer to, that of Richard Davidson at the University of Wisconsin–Madison. Now Amishi is planning to attend the International Symposium for Contemplative Studies this fall, a gathering of thousands of neuroscientists, psychologists, and humanities and education experts; there, along with the

Dalai Lama and Arianna Huffington, Amishi will be a keynote speaker.

Amishi's immigrant background has helped pave the way along her chosen research path. Growing up in a Hindu-Indian family, she watched her mother practice meditation daily; although she did not try meditation until later in life, being familiar with these practices—and being “bicultural”—was helpful in communicating and translating her research in various settings.

“What I'm doing is trying to bridge mindfulness as an Eastern-inspired contemplative practice with modern, Western neuroscience,” says Amishi. “Bridging neuroscience with the military context, and bridging mindfulness with the academic context ... I think that there are some things that immigrants, who already have a very personal understanding of what it means to bridge different worlds and worldviews, may be particularly skilled at.”

Photos of Amishi Jha courtesy of Tom Cogill

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