

- Sounds

Why music hits all the right notes in your brain

- The power of sound can stimulate and calm the mind

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Numerous studies have found that stress has a profound effect on the brain. Research published early this year from a study concludes that perceived stress can have long-term physiological and psychological consequences and is a risk factor for cognitive impairment and Alzheimer's disease.



The study was called “Association of stress with cognitive function among older black and white US adults” and carried out by Ambar Kulshreshtha and others of Emory University School of Medicine in Atlanta, US.

SA neurologist Dr Kirti Ranchod says chronic stress affects our memory, mood, emotional processing and ability to focus. The neurobiological changes that occur in the brain with chronic stress include:

- Reduced hippocampal volume. The hippocampus is a critical structure for processing memory and regulating mood.
 - Reduced plasticity. Brain-derived neurotrophic factor (BDNF) is reduced with chronic stress. This leads to reduced plasticity in the hippocampus.
 - Reduced neurogenesis. High levels of cortisol associated with chronic stress and reduced levels of BDNF contribute to reduced neurogenesis. Given this, studies have shown that chronic stress affects our memory, mood, emotional processing, and our ability to focus. This has an impact on our performance at work and our interpersonal relationships.
- Ranchod recently hosted a series of talks on brain health at the Wits Origins Centre. There was one called “Finding calm with music and memory” and so it was I found myself driving into the centre of Johannesburg in pursuit of something rarely found there: calm.
- Ranchod explained what set her on the path of encouraging people to find peace and quiet in their day. “I started doing this work as my grandmother had Alzheimer's disease. There is no effective treatment for this illness but lifestyle factors can modify risk and progression. To protect memory, we have to protect the brain; that led me to the work that I am doing.”

She is a co-founder and chairperson of the Africa Brain Health Network, with the mission to promote Afrocentred narratives of brain health, create awareness of brain health across the life course, create awareness of risk factors for brain disorders, and bridge divides by bringing together experiences of the brain and mental health disorders across the continent.

SOOTHING TWANG

Ranchod is a great believer in the power of music to stimulate and soothe the brain. She began the “Finding calm with music and memory” event by demonstrating some of the ancient traditional musical instruments that are kept there. These included a bow with a gourd attached that emits a soothing twang when tapped with a stick.

She spoke of SA musician Pops Mohamed’s experience with the San in the Kalahari, where he collected some of their music and incorporated it into his jazz projects. Mohamed tells of how he witnessed playing the mouth bow helped the desert people achieve a sense of transformative calm and peace. The children lay on their backs and gazed at the stars while playing, and the bow was played when mothers were giving birth to help allay their pain.

(Mohamed demonstrates the mouth bow at memorability.co/musicasmeditation/)

The Origins Centre has permanent installations charting our ancient providence in Africa but somehow always presents something new. We lingered at a video presentation of the San performing a fire dance and chant, with Ranchod explaining that the ritual produces a state of deep trance that is meditative and healing.

As we gathered around ancient boulders in one of the dimly lit rooms, people shared their experiences of growing up with music. “Music is part of life in the township,” said one. “At home our family was always singing, in the street children were clapping and singing while they played, there was singing in the churches.”

The crowd of about 40 ended up at the auditorium, where Ranchod played a beautiful track by Vusi Mahlangu and others. “Music is linked to mood, it can create an experience. What music helps you feel calmer? Can you listen to that regularly?”

She emphasises that we should seek out moments every day for calm, and how music can stimulate memory and provide relaxation for the brain.

I don’t think I was the only one who resolved from now on to lie on the couch and listen to my favourite Rachmaninov rather than have it in the background while doing other things. I had an image of the music seeping in to my brain and massaging it, helping to mend the frazzled nerves and grow new endings.

Ranchod says she chose the Origins Centre for her talks and walkabouts focusing on brain health because it “features aspects of our cultural heritage and traditions. Part of my work to support better brain and mental health looks at what we have within our traditions and cultures that can do this. I discuss the impact of certain cultural traditions, for example the use of music in different cultural contexts, how music has been used to help people”.

Later, in an interview, I ask her to expand on the calming effect that things like nature and music have on the brain.

“It is easier to understand how stress affects the brain,” she says. “The physiological stress response is designed to protect us from threat or disaster. Part of this stress response is to optimise the way your brain functions so that you can focus on threat and protect yourself (attention, focus, memory, problem-solving etc).

“Uncertainty, frequent change, demanding work environments can be perceived as stress as well.”

It’s a state where we even become dismissive of the positive things in life: “We are focused on threats and disasters

— that’s where our attention is. So we won’t pay attention or remember when someone helps us, gives way in traffic, and we are also less able to perceive things as rewarding, helpful or beautiful because we are primed to protect or defend ourselves from threat.”

CHRONIC STRESS

Ranchod believes music is one of the tools that can be used in the fight against mental illness: “Many of us are experiencing more stress and uncertainty, potentially leading to anxiety. Chronic stress can increase the risk of mental illness and other illnesses that affect the brain and body. Chronic stress may cause the memory and mood part of the brain to shrink, changing the way we learn and remember and increasing the risk of Alzheimer’s disease. Music is a practical tool that can help us to feel calm and reduce the impact of stress.”

Commenting on the study by Kulshreshtha, Ranchod says the damage from stress to the brain can be of a short or longer duration: “Stress has an impact on cognition/thinking skills, both in the long-term and shortterm.

There are structural or systemic factors such as racism, food security, and safety etc. that need to be addressed at a systems and policy level. We also need to provide effective solutions to empower individuals to cope better with different stressors in addition to these systematic changes.”

There are things we can do as individuals to protect our brains. “While stress does have an impact on brain function, we also have the ability to respond to stress in a way that can limit the harmful impact on our health, which is part of what I do and why I think promoting brain health is so important.

“It is important to realise that on some level we can’t escape the stressors in life since they come in different shapes and forms. We can try to respond in ways that support our health. This requires time, effort and practice to be effective. These solutions can be medical but there are many tools within our traditions, cultures, families or communities that are helpful.

“My professional and personal experiences have reinforced the idea that managing stress or finding calm is essential for optimal brain function.”

The answer can be as simple as taking regular walks in nature or taking the time to listen to your favourite music.