Zen meditation improves sense of touch

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Credit: Rice University

A study conducted with experienced scholars of zen meditation shows that mental focusing can induce learning mechanisms similar to physical training. Researchers at the Ruhr-University Bochum and the Ludwig-Maximilians-University München discovered this phenomenon during a scientifically monitored meditation retreat. The journal *Scientific Reports*, from the makers of *Nature*, has now published their new findings on the plasticity of the brain.

Participants of the study use a special meditation technique

The participants were all Zen scholars with many years of meditation practice. They were scientifically escorted during a four-day Zen retreat in the spiritual center Benediktushof, Germany. The retreat was held in complete silence, with at least eight hours of meditation per day. All participants practiced their familiar meditation, which is characterized by a non-specific monitoring of thoughts and surroundings. Additionally, some participants applied a special finger meditation for two hours per day, during which they were asked to specifically focus on their right index finger and become aware of spontaneously arising sensory percepts in this finger. Subsequent assessment of the group that practiced finger meditation showed a significant improvement in the tactile acuity of the right index and middle finger. A control group that had maintained their familiar meditation practice for the whole time showed no changes in tactile acuity.

Data show significant improvement of the sense of touch

In order to assess the sense of touch quantitatively, researchers measured the so-called "two-point discrimination threshold." This marker indicates how far apart two stimuli need to be in order to be discriminated as two separate sensations. After the finger meditation, the performance improved on average by 17 percent. By comparison, tactile acuity of the visually impaired is 15 to 25 percent above that of typical sighted individuals, because their sense of touch is used so intensively to make up for the reduced visual information. Hence, the changes induced by meditation are comparable to those achieved by intense long-term training.

Meditation induces plasticity and learning processes as active training or physical stimulation

It is known that extensive training induces neuroplasticity, which denotes the ability of the brain to adapt and restructure itself, thereby improving perception and behavior. Recently, the group of neuroscientists of the Neural Plasticity Lab headed by Hubert Dinse has shown that these processes can be initiated even without training by mere exposure to passive stimulation, which was translated only recently into a stimulating glove, which is used as a therapeutic intervention in stroke patients. The fact that mental states without any physical stimulation can improve perception has

now been shown for the first time. "The results of our study challenge what we know about learning mechanisms in the brain. Our concept of neuroplasticity must be extended, because mental activity seems to induce learning effects similar to active stimulation and physical training," Dinse suggests.

More information: "Enhanced tactile acuity through mental states." *Sci. Rep*. 5,13549; DOI: 10.1038/srep13549

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