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In een eerdere f-MRI studie in Denemarken met zenstudenten van Zen.nl werd eerder ook een significant effect aangetoond in de anterior cingulate tijdens zenbeoefening. Zie :

<http://www.zen.nl/hersenscan.pdf>

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## Zen meditation enables you to manage pain

### About the study:

The article, "Cortical Thickness and Pain Sensitivity in Zen Meditators," published in the journal *Emotion*, was authored by Joshua A. Grant, Jérôme Courtemanche, Emma Duerden, Gary H. Duncan and Pierre Rainville of the Université de Montréal and its affiliated Institut universitaire de gériatrie de Montréal.



Joshua A. Grant, a doctoral student in the Department of Physiology, co-authored the paper with Pierre Rainville, a professor and researcher at the Université de Montréal and its affiliated *Institut universitaire de gériatrie de Montréal*. The main goal of their study was to examine whether trained meditators perceived pain differently than non-meditators.

"While previous studies have shown that teaching chronic pain patients to meditate is beneficial, very few studies have looked at pain

processing in healthy, highly trained meditators. This study was a first step in determining how or why meditation might influence pain perception." says Grant.

### Meditate away the pain

For this study, the scientists recruited 13 Zen meditators with a minimum of 1,000 hours of practice to undergo a pain test and contrasted their reaction with 13 non-meditators. Subjects included 10 women and 16 men between the ages of 22 to 56.

Joshua Grant

The administered pain test was simple: A thermal heat source, a computer controlled heating plate, was pressed against the calves of subjects intermittently at varying temperatures. Heat levels began at 43 degrees Celsius and went to a maximum of 53 degrees Celsius depending on each participant's sensitivity. While quite a few of the meditators tolerated the maximum temperature, all control subjects were well below 53 degrees Celsius.

Grant and Rainville noticed a marked difference in how their two test groups reacted to pain testing – Zen meditators had much lower pain sensitivity (even without meditating) compared to non-meditators. During the meditation-like conditions it appeared meditators further reduced their pain partly through slower breathing: 12 breaths per minute versus an average of 15 breaths for non-meditators.

"Slower breathing certainly coincided with reduced pain and may influence pain by keeping the body in a relaxed state." says Grant. "While previous studies have found that the emotional aspects of pain are influenced by meditation, we found that the sensation itself, as well as the emotional response, is different in meditators."

The ultimate result? Zen meditators experienced an 18 percent reduction in pain intensity. "If meditation can change the way someone feels pain, thereby reducing the amount of pain medication

required for an ailment, that would be clearly beneficial,” says Grant.

**Partners in research:**

This study was funded by the Canadian Institutes of Health Research, the Mind and Life Institute Varela Grant (J.A.G.) and the *Fonds de la recherche en santé du Québec*.

## Zen can reinforce a central brain region.

People can reduce their sensitivity to pain by thickening their brain, according to a new study published in a special issue of the American Psychological Association journal, *Emotion*. Researchers from the Université de Montréal made their discovery by comparing the grey matter thickness of Zen meditators and non-meditators. They found evidence that practicing the centuries-old discipline of Zen can reinforce a central brain region (anterior cingulate) that regulates pain.

“Through training, Zen meditators appear to thicken certain areas of their cortex and this appears to be underlie their lower sensitivity to pain,” says lead author Joshua A. Grant, a doctoral student in the Université de Montréal Department of Physiology and Institut universitaire de gériatrie de Montréal. “We found a relationship between cortical thickness and pain sensitivity, which supports our previous study (zie hieronder) on how Zen meditation regulates pain.”

As part of this study, scientists recruited 17 meditators and 18 non-meditators who in addition had never practiced yoga, experienced chronic pain, neurological or psychological illness. Grant and his team, under the direction of Pierre Rainville of the Université de Montréal and the Institut universitaire de gériatrie de Montréal, measured thermal pain sensitivity by applying a heated plate to the calf of participants and followed by scanning the brains of subjects with structural magnetic resonance imaging. According to MRI results, central brain regions that regulate emotion and pain were significantly thicker in meditators compared to non-meditators.

“The often painful posture associated with Zen meditation may lead to thicker cortex and lower pain sensitivity,” says Grant, noting that meditative practices could be helpful in general for pain management, for preventing normal age-related grey matter reductions or potentially for any condition where the grey matter is compromised such as stroke.

**Partners in research:**

This study was supported jointly by a Canadian Institutes of Health Research and a Mind and Life Institute Varela Grant.