



## School of Spiritual & Cultural Studies

# Benefits of Meditation – What Science knows.

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MA OM- Mastery Over Mind

# The Science of Meditation: What we Know

## **Lecture objectives:**

List how meditation helps humanity according to what we know from research.



# Benefits of Meditation – as per Science

1. Improved Attention
2. Better resilience to stress
3. Increases levels of compassion
4. Improves wellbeing
5. Positive impact on relationships
6. Reduce kinds of mental bias
7. Modest effect on better physical health
8. May not be good for all
9. May slow aging



# Benefits of Meditation – as per Science

## 1. Improved Attention

- Improvements in **sustained attention**.
- **Reduced Cognitive Rigidity** – a reduced tendency to overlook novel and adaptive ways of responding due to past experience

### “Mind the Trap”: Mindfulness Practice Reduces Cognitive Rigidity

Jonathan Greenberg , Keren Reiner, Nachshon Meiran

Published: May 15, 2012 • <https://doi.org/10.1371/journal.pone.0036206>

[Psychol Sci](#). Author manuscript; available in PMC 2011 Jul 11.

Published in final edited form as:

[Psychol Sci](#). 2010 Jun; 21(6): 829–839.

Published online 2010 May 11. doi: [10.1177/0956797610371339](https://doi.org/10.1177/0956797610371339)

PMCID: PMC3132583

NIHMSID: NIHMS300783

PMID: [20483826](https://pubmed.ncbi.nlm.nih.gov/20483826/)

### Intensive Meditation Training Improves Perceptual Discrimination and Sustained Attention

[Katherine A. MacLean](#),<sup>1,2</sup> [Emilio Ferrer](#),<sup>1</sup> [Stephen R. Aichele](#),<sup>1</sup> [David A. Bridwell](#),<sup>3</sup> [Anthony P. Zanesco](#),<sup>2</sup>

[Tonya L. Jacobs](#),<sup>2</sup> [Brandon G. King](#),<sup>2</sup> [Erika L. Rosenberg](#),<sup>2</sup> [Baljinder K. Sahdra](#),<sup>1,2</sup> [Phillip R. Shaver](#),<sup>1</sup> [B. Alan Wallace](#),<sup>4</sup>

[George R. Mangun](#),<sup>1,2,5</sup> and [Clifford D. Saron](#)<sup>2,6</sup>

### More Meditation, Less Habituation? The Effect of Mindfulness Practice on the Acoustic Startle Reflex

Elena Antonova , Paul Chadwick, Veena Kumari

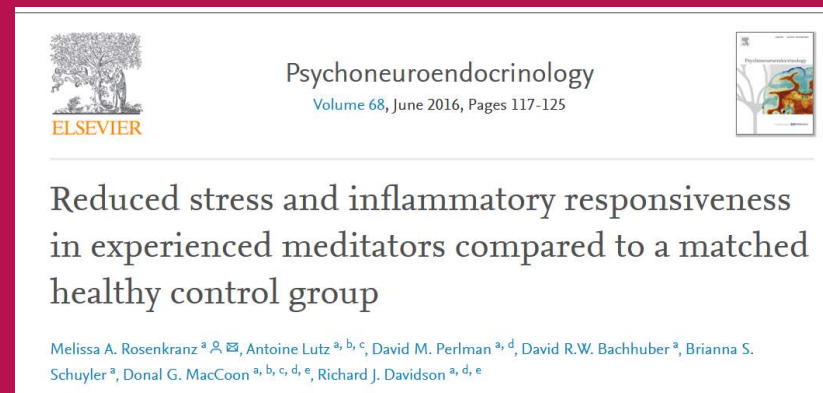
Published: May 6, 2015 • <https://doi.org/10.1371/journal.pone.0123512>



# Benefits of Meditation – as per Science

## 2. Better resilience to stress

- Ability to **reduce psychological stress** and experimentally-induced inflammation.
- Experienced meditators reported higher levels of psychological factors associated with wellbeing and **resilience**.
- **functional neuroplastic changes**, suggesting an amygdala-sgACC pathway for stress reduction effects.





# Benefits of Meditation – as per Science

## 3. Increase Levels of Compassion

- Increases our willingness to take action to **relieve suffering**.
- **Decreased mind-wandering** – as seen in functional studies on changes of default mode network in cortical regions. – perhaps less worrying about ourselves and our identity in the world!

[Psychol Sci](#). Author manuscript; available in PMC 2013 Oct 1.

Published in final edited form as:

[Psychol Sci](#). 2013 Jul 1; 24(7): 1171–1180.

Published online 2013 May 21. doi: [10.1177/0956797612469537](#)

PMCID: PMC3713090

NIHMSID: NIHMS440274

PMID: [23696200](#)

Compassion training alters altruism and neural responses to suffering

[Helen Y. Weng](#),<sup>1,3,4</sup> [Andrew S. Fox](#),<sup>1,3,4,5</sup> [Alexander J. Shackman](#),<sup>2,5</sup> [Diane E. Stodola](#),<sup>3</sup> [Jessica Z. K. Caldwell](#),<sup>1,3,6,7</sup> [Matthew C. Olson](#),<sup>3</sup> [Gregory M. Rogers](#),<sup>2</sup> and [Richard J. Davidson](#)<sup>1,2,3,4,5</sup>

> [Proc Natl Acad Sci U S A](#). 2011 Dec 13;108(50):20254-9. doi: 10.1073/pnas.1112029108.  
Epub 2011 Nov 23.

**Meditation experience is associated with differences in default mode network activity and connectivity**

Judson A Brewer<sup>1</sup>, Patrick D Worhunsky, Jeremy R Gray, Yi-Yuan Tang, Jochen Weber, Hedy Kober



# Benefits of Meditation – as per Science

## 4. Improve wellbeing

- Not a huge change to mental health.
- Some meditation techniques suggest outcomes can be more salutogenic immune profile.
- 2014 study on 3,515 participants: meditation programs resulted only in small to moderate reductions in anxiety and depression
- **individuals show a relatively poor understanding** of Subjective Well-Being.

March 2014

### **Meditation Programs for Psychological Stress and Well-being** A Systematic Review and Meta-analysis

Madhav Goyal, MD, MPH<sup>1</sup>; Sonal Singh, MD, MPH<sup>1</sup>; Erica M. S. Sibinga, MD, MHS<sup>2</sup>; [et al](#)

» [Author Affiliations](#) | [Article Information](#)

*JAMA Intern Med.* 2014;174(3):357-368. doi:10.1001/jamainternmed.2013.13018

> [PLoS One](#). 2022 Jun 24;17(6):e0270503. doi: 10.1371/journal.pone.0270503. eCollection 2022.

### **Doing well-being: Self-reported activities are related to subjective well-being**

August Håkan Nilsson <sup>1</sup>, Erik Hellryd <sup>1</sup>, Oscar Kjell <sup>1</sup>



# Benefits of Meditation – as per Science

## 5. Positive Impacts on Relationships

- 2016 study – 88 couples – cortisol – spiked levels of cortisol came back to normal sooner among meditators.
- **Better parenting outcomes–** 2014 study on distress in mothers of children with autism or disabilities. 2016 fMRI study on parents of adolescents.

ORIGINAL PAPER | Published: 25 June 2016

Parenting an Early Adolescent: a Pilot Study Examining Neural and Relationship Quality Changes of a Mindfulness Intervention

Lisa M. May , Mora A. Reinka, Jessica M. Tipsord, Joshua C. Felver & Elliot T. Berkman



Hormones and Behavior

Volume 79, March 2016, Pages 45-51



Mindfulness during romantic conflict moderates the impact of negative partner behaviors on cortisol responses

Heidermaria K. Laurent<sup>a,b</sup>, Robin Lieth<sup>a,b</sup>, Benjamin Nelson<sup>b</sup>, Sara M. Laurent<sup>a,b</sup>

ARTICLE | AUGUST 01 2014

### Reducing Distress in Mothers of Children With Autism and Other Disabilities: A Randomized Trial

Elisabeth M. Dykens, PhD ; Marisa H. Fisher, PhD; Julie Lounds Taylor, PhD; Warren Lambert, PhD; Nancy Miodrag, PhD





# Benefits of Meditation – as per Science

## 6. Reduce mental bias

- 2014 study – reduced **prejudice toward homeless** people
- **Reduce** our natural **tendency** to focus **on** the **negative things** in life.
- Less reactive to negative and showed higher indications of positive feelings.

### Evidence That a Brief Meditation Exercise Can Reduce Prejudice Toward Homeless People

Stefania Parks, Michèle D. Birtel, and Richard J. Crisp

Published Online: January 01, 2014 • <https://doi.org/10.1027/1864-9335/a000212>

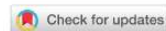
### Mindfulness Trait Predicts Neurophysiological Reactivity Associated with Negativity Bias: An ERP Study

Nerissa S. P. Ho,<sup>1,2</sup> Delin Sun,<sup>1,2</sup> Kin-Hung Ting,<sup>3</sup> **Chetwyn C. H. Chan** ,<sup>3</sup> and **Tatia M. C.**

### Looking Up: Mindfulness Increases Positive Judgments and Reduces Negativity Bias

Laura G. Kiken, Natalie J. Shook

First Published January 10, 2011 | Review Article |



<https://doi.org/10.1177/1948550610396585>



# Benefits of Meditation – as per Science

## 7. Better Physical health

- Ayurveda shows positive impacts of meditation in lifestyle to better physical health.
- **meditators** seem to have an increased activity of **telomerase**, an enzyme implicated in longer cell life and, therefore, longevity.
- 2012 - Epigenetics study - long-term meditators found different patterns of DNA activation
- 2014 Davidson study - lower expression of genes involved in inflammation

> [J Ayurveda Integr Med.](#) Jan-Mar 2021;12(1):107-111. doi: 10.1016/j.jaim.2021.01.006.  
Epub 2021 Feb 11.

### Improvement in Gastrointestinal Quality of Life Index (GIQLI) following meditation: An open-trial pilot study in India

[Divya Kanchibhotla](#)<sup>1</sup>, [Peeyush Sharma](#)<sup>2</sup>, [Saumya Subramanian](#)<sup>3</sup>

### Genome-wide expression changes in a higher state of consciousness

[Metka Ravnik-Glavac](#)<sup>1</sup>, [Sonja Hrašovec](#), [Jure Bon](#), [Jurij Dreo](#), [Damjan Glavac](#)

[Psychoneuroendocrinology](#). 2014 Feb; 40: 96–107.

PMID: [24485481](#)

Published online 2013 Nov 15. doi: [10.1016/j.psyneuen.2013.11.004](#)

Rapid changes in histone deacetylases and inflammatory gene expression in expert meditators

[Perla Kaliman](#)<sup>a,1</sup>, [María Jesús Álvarez-López](#)<sup>a,b</sup>, [Marta Cosín-Tomás](#)<sup>a,b</sup>, [Melissa A. Rosenkranz](#)<sup>c,d</sup>, [Antoine Lutz](#)<sup>c,d,e</sup> and [Richard J. Davidson](#)<sup>c,d,f,1</sup>



# Benefits of Meditation – as per Science

## 8. One size does not fit all

- Buddhist techniques have found **issues with challenging situations** experienced by meditators - extreme sensitivity to light and sound that they attributed to meditation.
- Case histories and meditation experiences vary across practices. (Perhaps why Yoga Gurus in India led to a personalized training strategy)

### The varieties of contemplative experience: A mixed-methods study of meditation-related challenges in Western Buddhists

Jared R. Lindahl , Nathan E. Fisher , David J. Cooper , Rochelle K. Rosen, Willoughby B. Britton  

Published: May 24, 2017 • <https://doi.org/10.1371/journal.pone.0176239>



# Benefits of Meditation – as per Science

## 9. May slow Aging

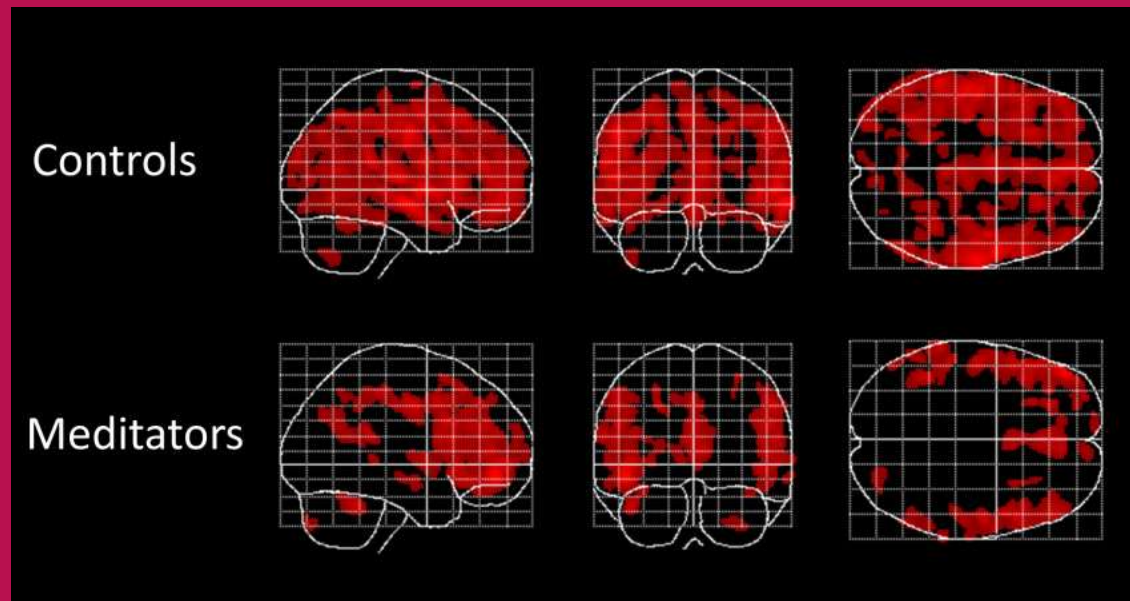
- UCLA researchers - E Luders & Colleagues 2015 found that meditation appeared to help preserve the brain's grey matter.

Front. Psychol., 09 July 2013  
Sec. Consciousness Research  
<https://doi.org/10.3389/fpsyg.2013.00398>

This article is part of the Research Topic  
What can neuroscience learn from contemplative practices?  
[View all 17 Articles >](#)

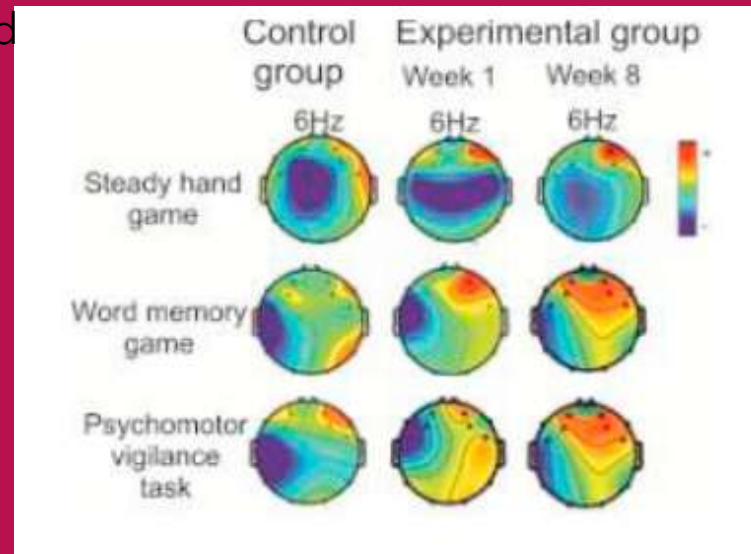
Meditation effects within the hippocampal complex revealed by voxel-based morphometry and cytoarchitectonic probabilistic mapping

Eileen Luders<sup>1\*</sup>, Florian Kurth<sup>2</sup>, Arthur W. Toga<sup>1</sup>, Katherine L. Narr<sup>1</sup> and Christian Gaser<sup>3,4</sup>



# Attention-based study indicate Theta frequencies – AMRITA study

- Integrated yoga-meditation practice modulates changes in neural activity related to memory and attention.
- Integrating Śavāsana and ma-om meditation in daily life activities are relatively easy since there are no complex stretches or postures and time needed is relatively shorter



Radhamani et al., 2020 , Kumar et al., 2021

# End of Journey

- Thank You.