

# **Positive Neuroplasticity:**

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## **How to Develop Inner Resources**

**Momentous Institute**

**October 10, 2014**

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**The Wellspring Institute for Neuroscience and Contemplative Wisdom**

**[WiseBrain.org](http://WiseBrain.org)**

**[RickHanson.net](http://RickHanson.net)**

# Topics

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- **Self-directed neuroplasticity**
- **How to grow inner strengths**
- **The negativity bias**
- **Taking in the good**
- **Key resource experiences**
- **Coming home**



**Waldo goes  
to India,  
finds himself.**



# **Self-Directed Neuroplasticity**



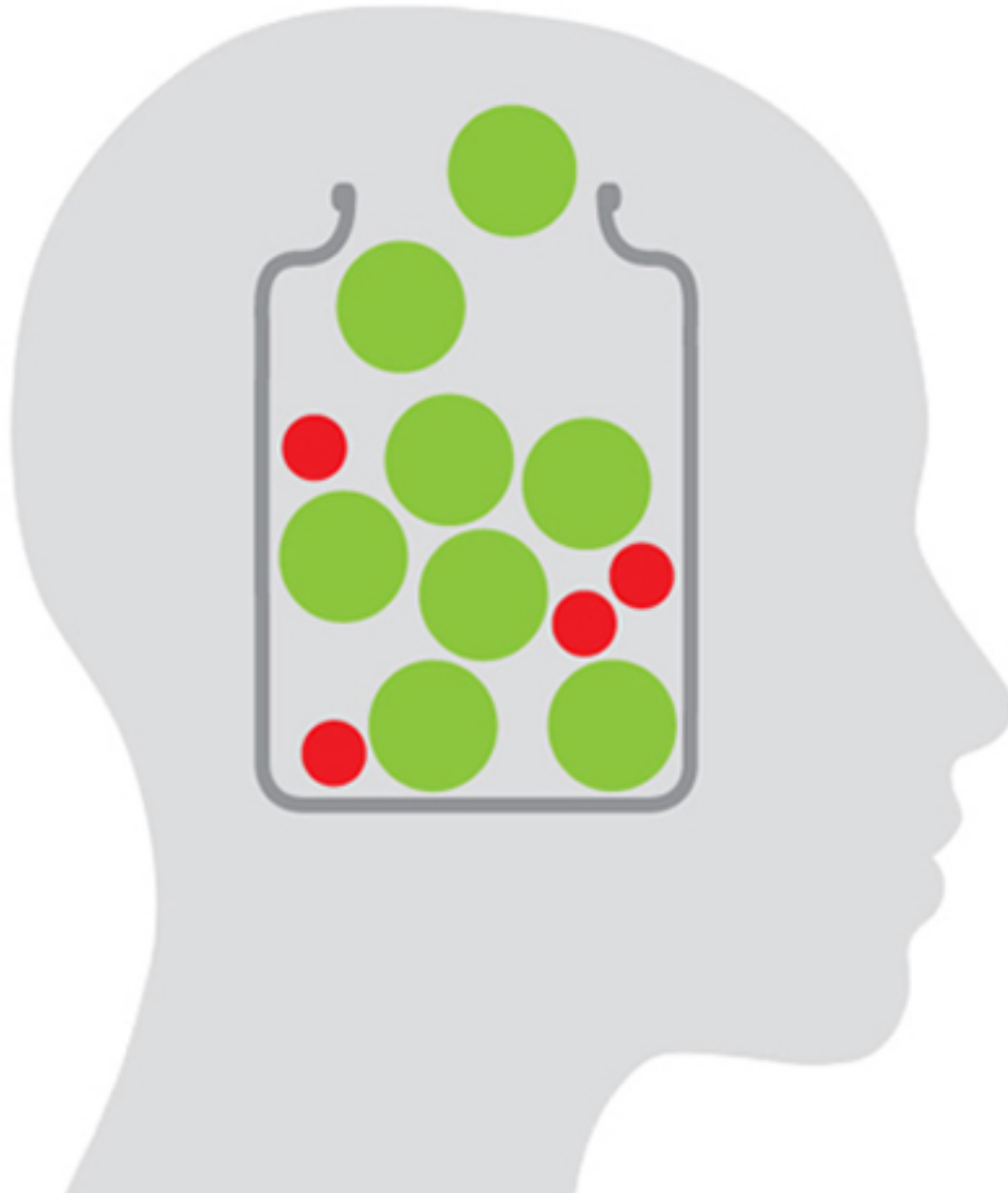
Two wolves in the heart

# Inner Strengths

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- **Understandings**
- **Capabilities**
- **Positive emotions**
- **Attitudes**
- **Motivations**
- **Virtues**

# INNER STRENGTHS ARE BUILT FROM BRAIN STRUCTURE

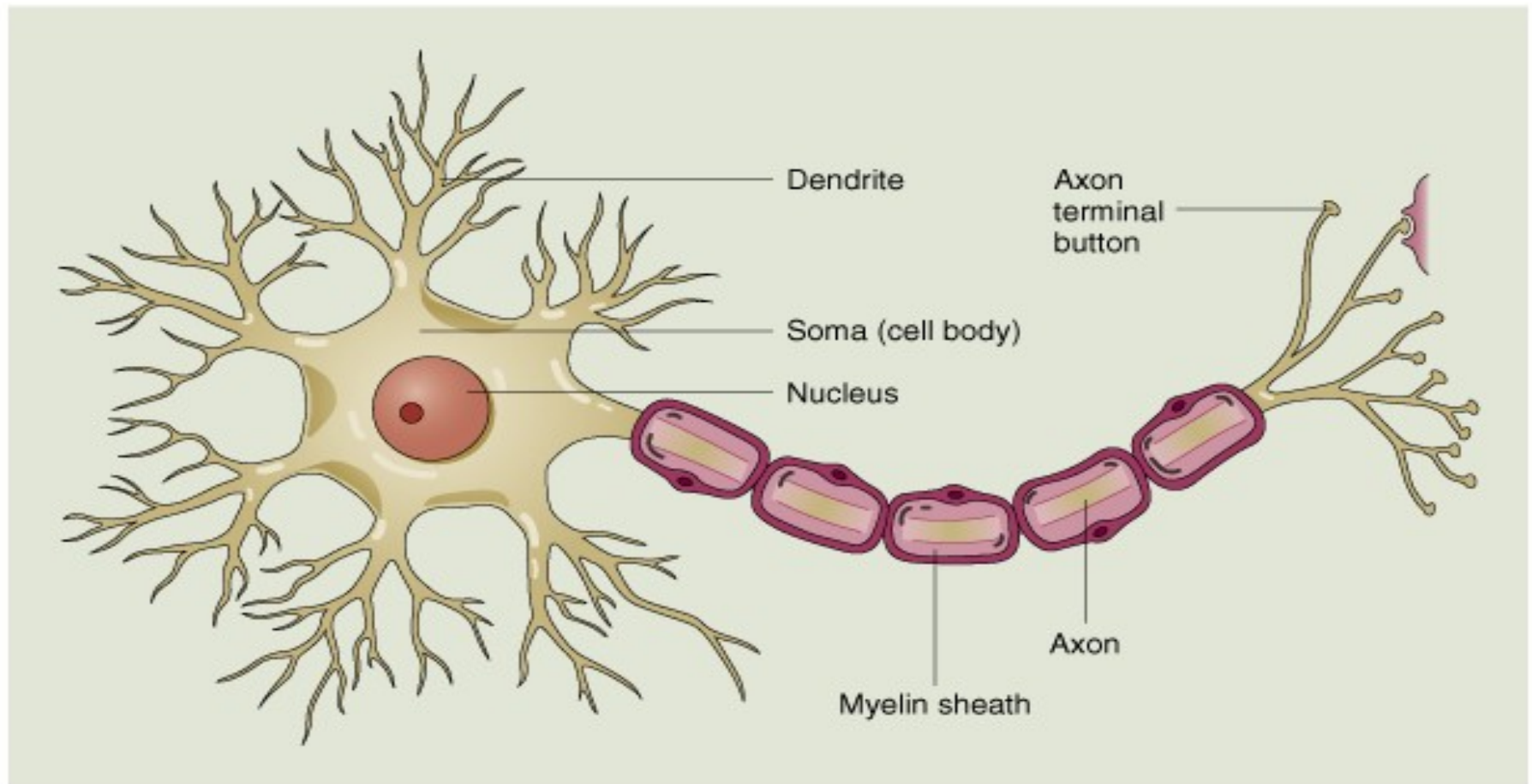






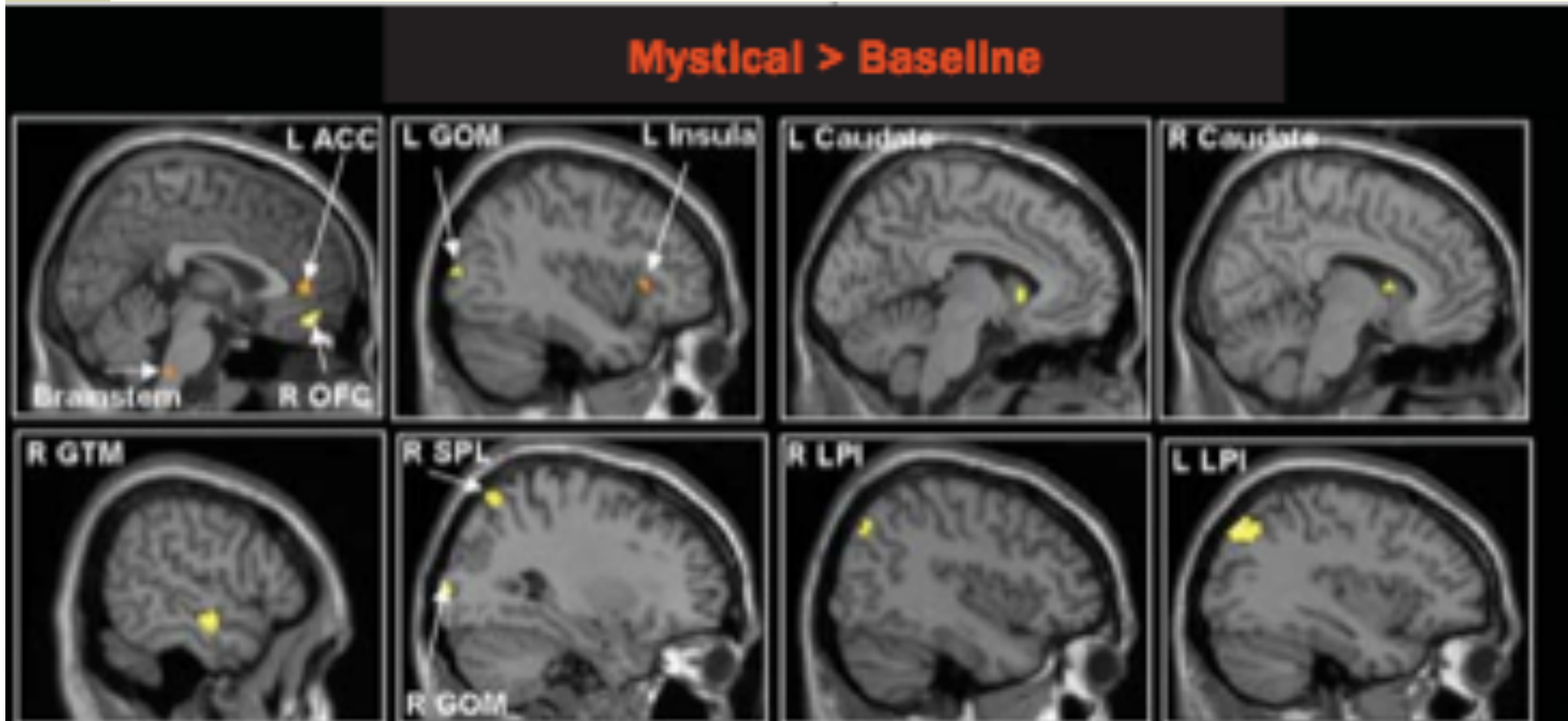


# A Neuron



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# Christian Nuns, Recalling a Profound Spiritual Experience



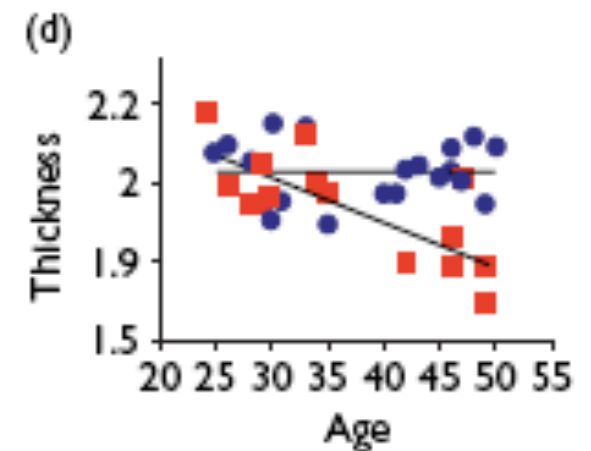
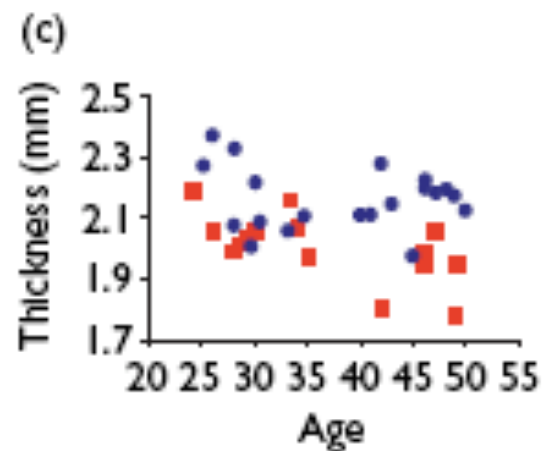
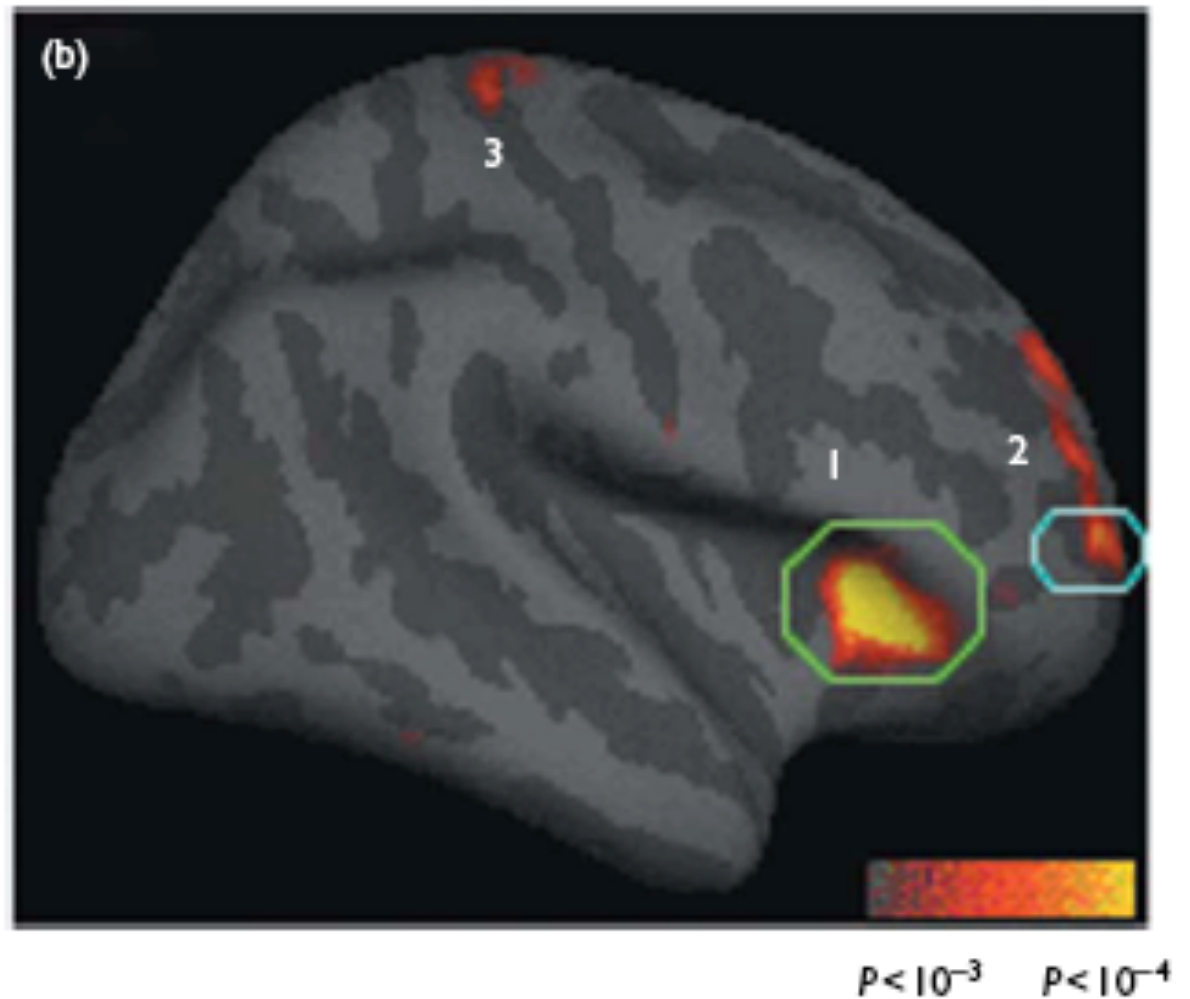
A detailed illustration of a neural network. Numerous yellow, thread-like axons crisscross the frame, connecting various cell bodies. In the center, a single neuron is highlighted with a bright green nucleus and a glowing green cell body, making it stand out from the rest of the network. The background is dark, emphasizing the luminous quality of the neurons.

Neurons that fire together,

wire together.



Lazar, et al. 2005.  
Meditation  
experience is  
associated  
with increased  
cortical thickness.  
*Neuroreport*, 16,  
1893-1897.





**We can use the mind**

**To change the brain**

**To change the mind for the better**

**To benefit ourselves and other beings.**





# **How to Grow Inner Strengths**

# Growing Gratitude

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- Think of things you feel grateful for . . . Let this become a feeling of gratitude.
- Stay with this experience . . . Open to it.
- Imagine or sense that gratitude is sinking into you . . . As you sink into it.

# The Neuropsychology of Learning


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**Learning – changing neural structure and function – proceeds in two stages:**

**From state to trait**

**From activation to installation**

**From short-term memory buffers  
to long-term storage**



**Inner strengths are grown from experiences of them or related factors - activated states - that are installed as traits.**




**You become more compassionate  
by repeatedly installing experiences of compassion.**


**You become more grateful  
by repeatedly installing experiences of gratitude.**

**You become more mindful  
by repeatedly installing experiences of mindfulness.**






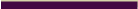
**Most experiences of inner strengths –  
resilience, kindness, insight,  
mindfulness, self-worth, love, etc. –  
are enjoyable.**




**Without installation,  
there is no learning,  
no change in the brain.**



**We're good at activation  
but bad at installation.**



**This is the fundamental weakness in  
most patient education, human resources  
training, psychotherapy, coaching,  
and mindfulness training.**



*The same research that proves therapy works  
shows no improvement in outcomes  
over the last 30 or so years.*

Scott Miller



# Installation





# **Installation**


# **Installation**



# **Installation**

# **Installation**

# **Installation**



**Meanwhile your painful,  
harmful experiences  
are being rapidly converted  
into neural structure.**



# **The Negativity Bias**

# Velcro for Bad, Teflon for Good

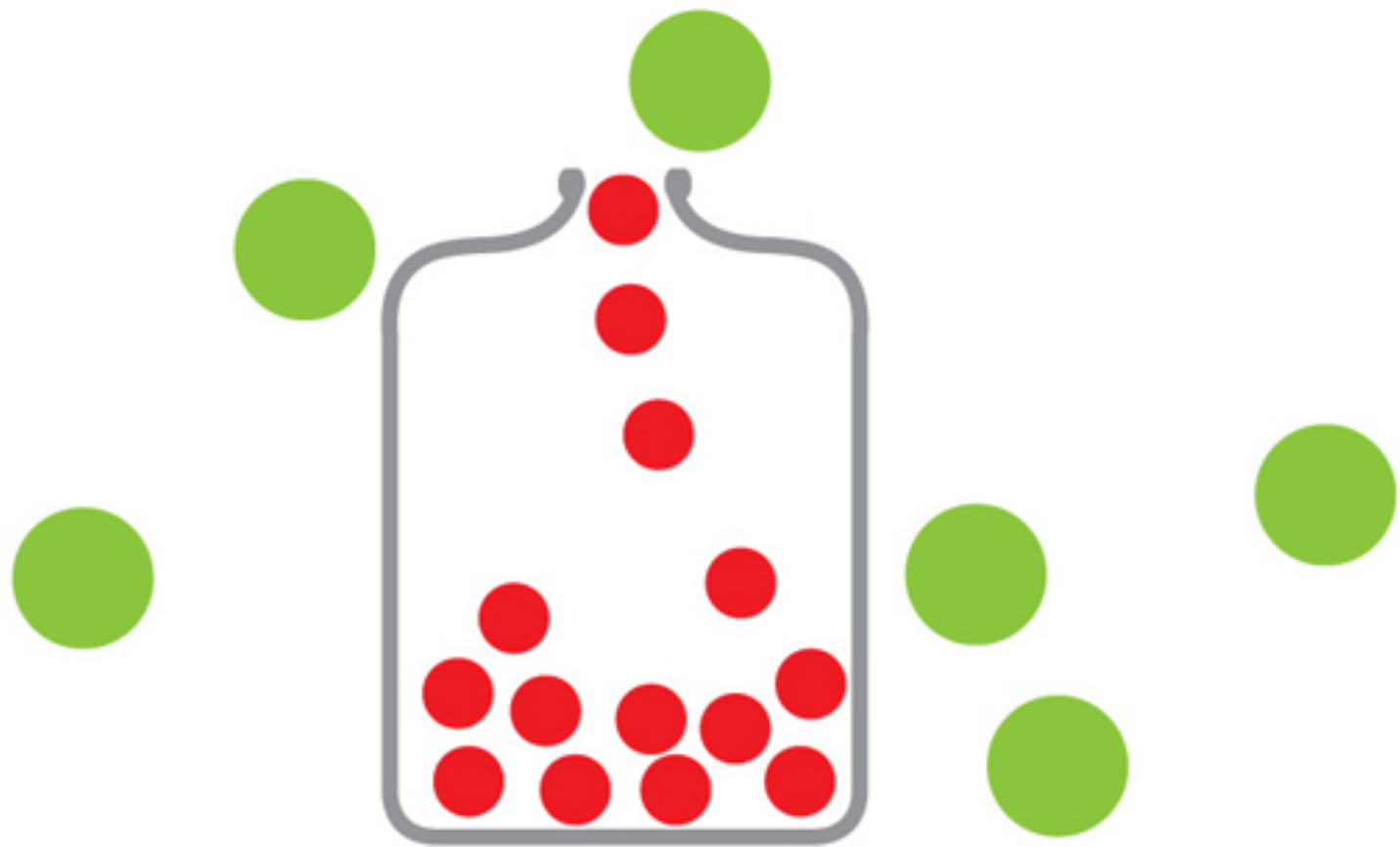
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The negativity bias

*bad experiences*

*good experiences*






The Negativity Bias

A composite image showing three Stone Age people in a modern city park. In the foreground, a man with long hair and a beard, wearing a loincloth, is crouching in a grassy field. Behind him, two other people are visible, one sitting and one standing. The background features a dense line of green trees and a tall, modern city building with many windows. The text "Stone age brains in the 21st century" is overlaid in white serif font on a dark green horizontal band across the middle of the image.

# Stone age brains in the 21st century

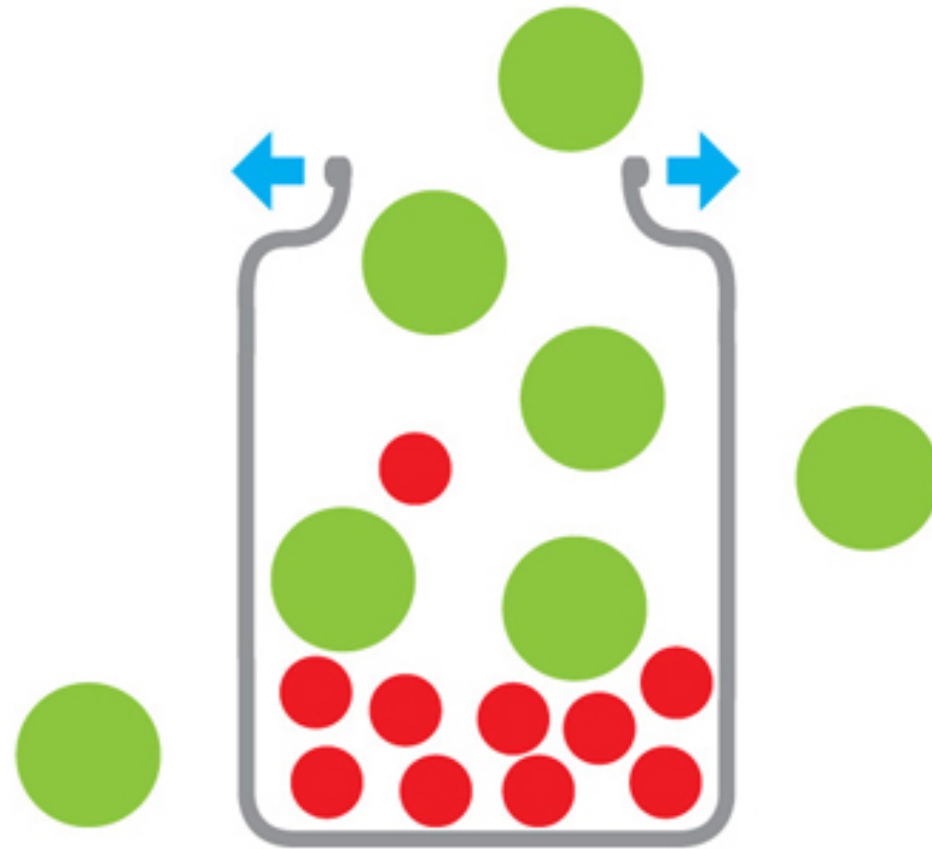


*We can deliberately use the mind  
to change the brain for the better.*

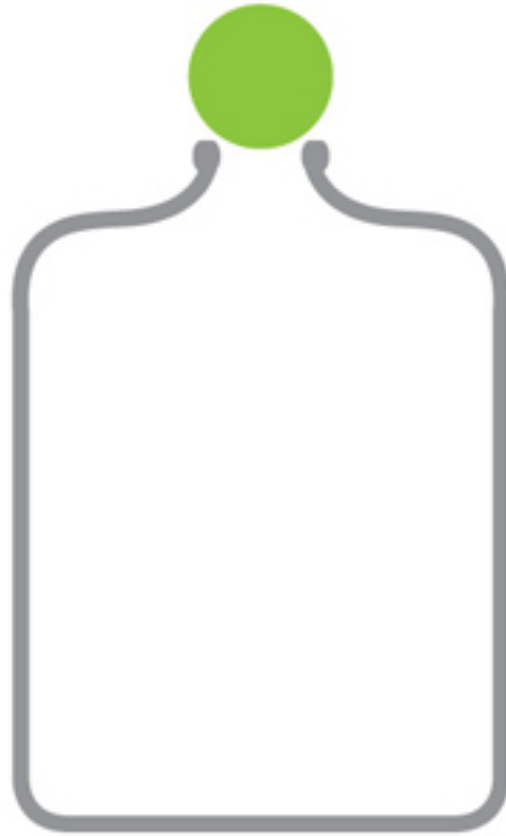


# **Taking in the Good**

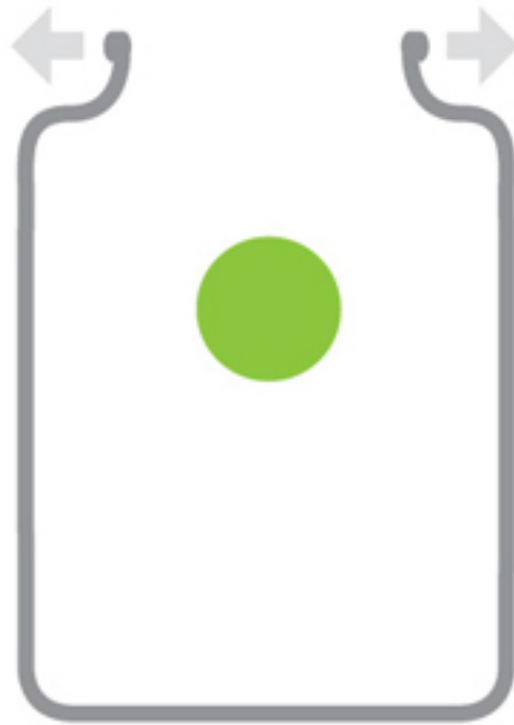




Learning to Take in the Good



Have a Good Experience



Enrich It

# How to Enrich an Experience

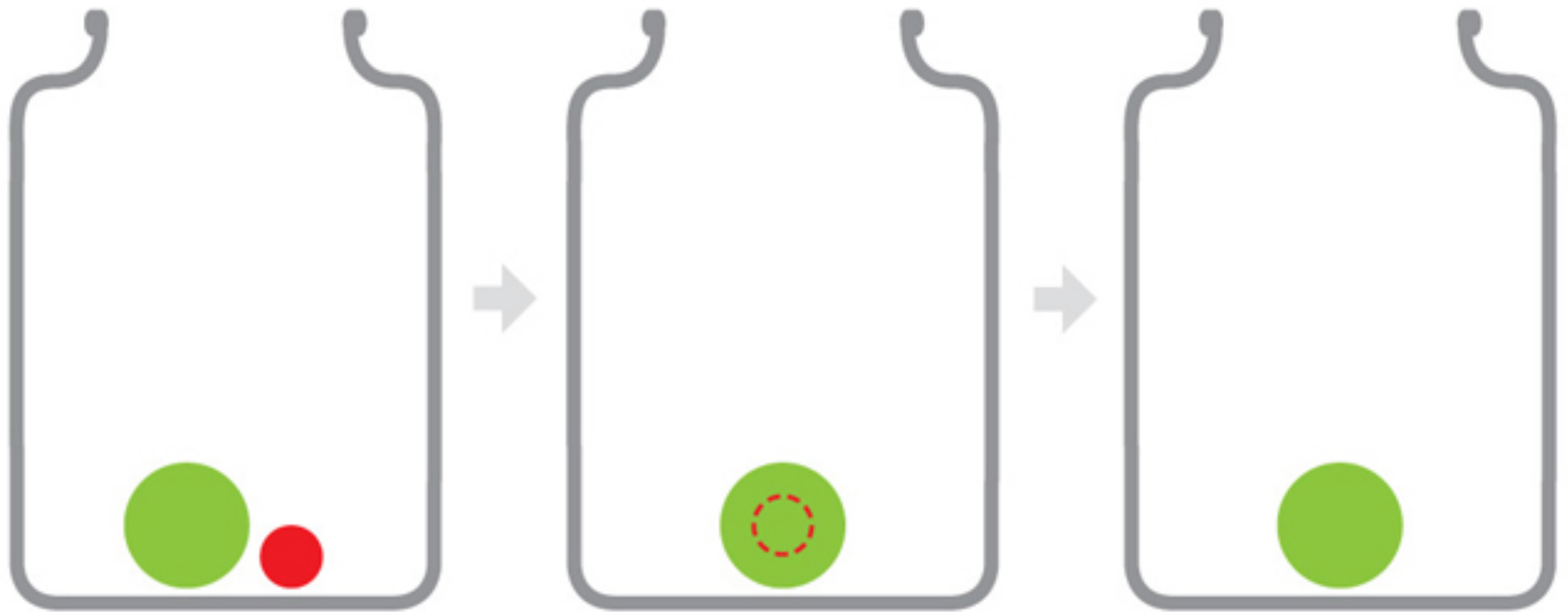
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- **Duration**
- **Intensity**
- **Multimodality**
- **Novelty**
- **Salience**





Absorb It



**L**ink Positive and Negative Material

# HEAL by Taking in the Good

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1. Have a positive experience. Notice it or create it.
2. Enrich the experience through duration, intensity, multimodality, novelty, personal relevance
3. Absorb the experience by intending and sensing that it is sinking into you as you sink into it.
4. Link positive and negative material. [optional]



Have It, Enjoy It

# Growing Compassion


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- Think of someone you care about. Be aware of this person's challenges, stress, and pain. Find the sincere wish that this person not suffer . . . With warmhearted concern.
- Stay with this experience . . . Open to it.
- Imagine or sense that compassion is sinking into you . . . As you sink into it.

# It's Good to Take in the Good

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- Development of specific inner strengths
- Implicit benefits
- Sensitizes brain to the positive
- Creates positive cycles



*Keep a green bough in your heart,  
and a singing bird will come.*

Lao Tsu

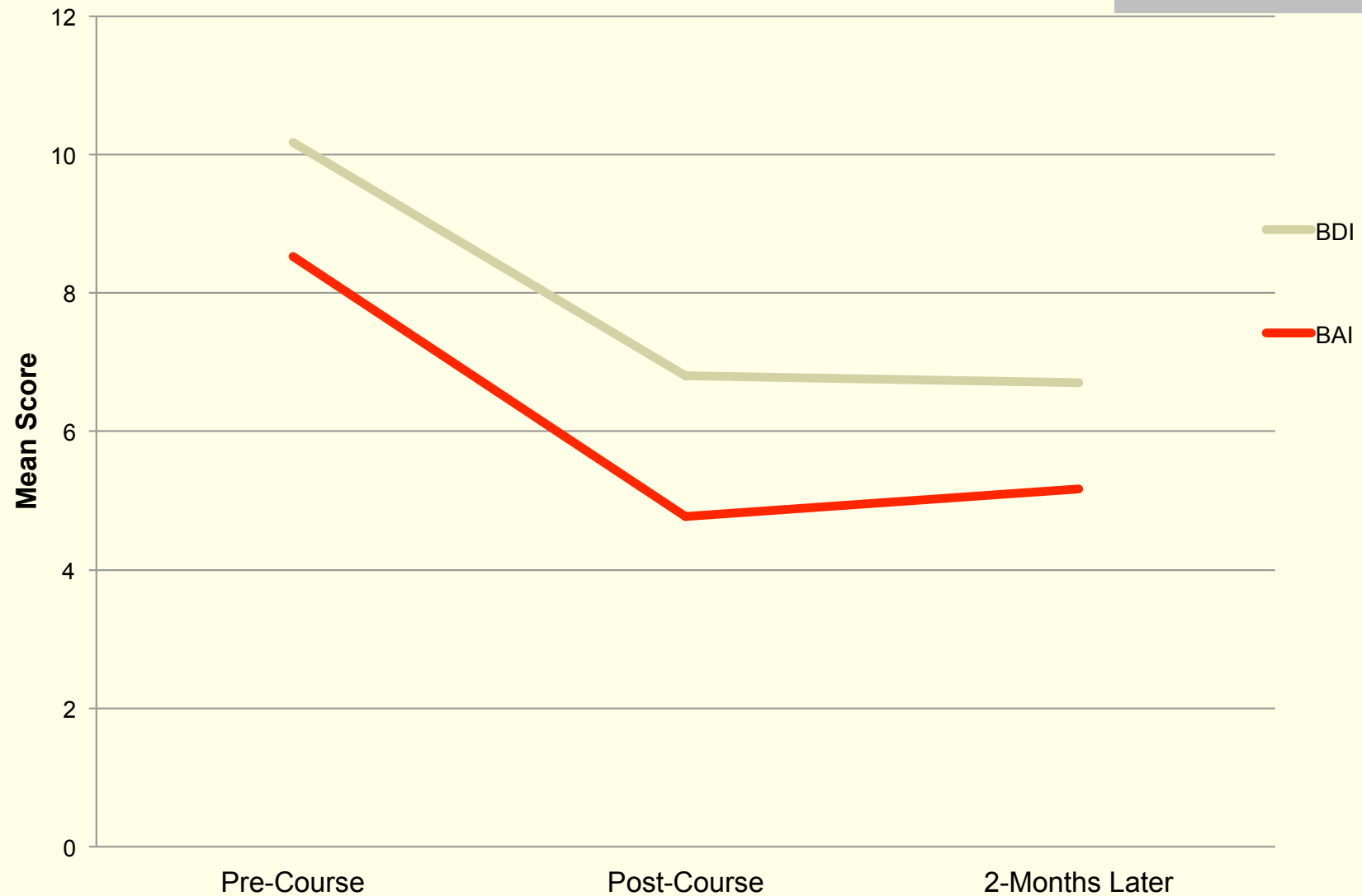
# Study on the HEAL Process

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- With collaborators from the University of California, a 2013 study on the HEAL course, using a randomized waitlist control group design (46 subjects)
- Course participants, compared to the control group, reported more Contentment, Self-Esteem, Satisfaction with Life, Savoring, and Gratitude.
- After the course and at two month follow-up, pooled participants also reported more Love, Compassion, Self-Compassion, Mindfulness, Self-Control, Positive Rumination, Joy, Amusement, Awe, and Happiness, and less Anxiety and Depression.



# Combined Sample: Depression (BDI) & Anxiety (BAI)



# The Four Ways to Offer a Method

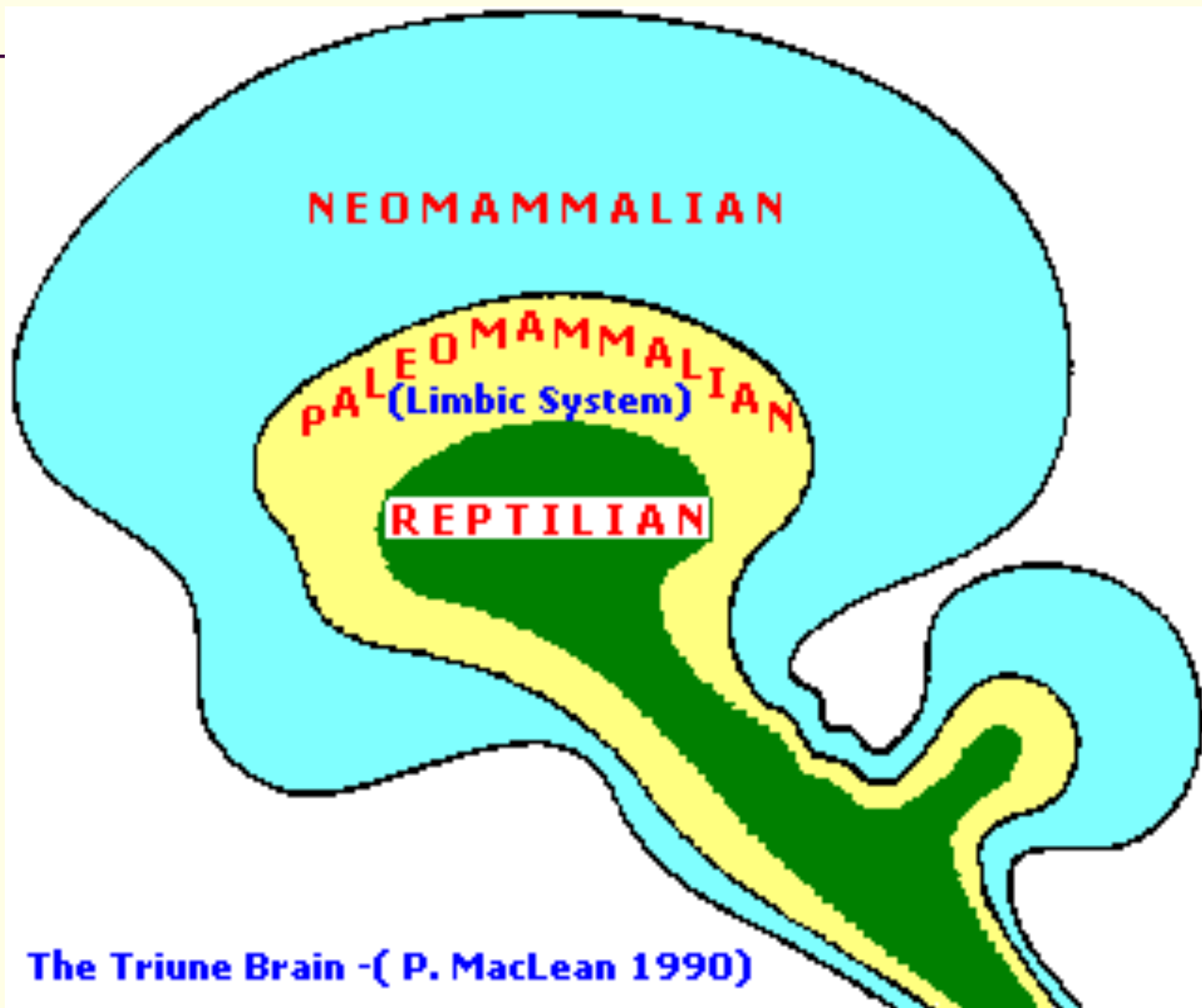
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- Doing it implicitly
- Teaching it and then leaving it up to the person
- Doing it explicitly with the person
- Asking the person to do it on his or her own



# **Key Resource Experiences**

# The Evolving Brain





**"With all due respects, I find your disparaging remarks about the 'reptilian brain' unnecessary"**

# **Our Three Fundamental Needs**

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**Safety**

**Satisfaction**

**Connection**

# Needs Met by Three Systems

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**Safety – Avoiding harms**

**Satisfaction – Approaching rewards**

**Connection – Attaching to others**



# Pet the Lizard



# Feed the Mouse

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# Hug the Monkey

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# Some Types of Resource Experiences

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## Avoiding Harms

- Feeling basically alright right now
- Feeling protected, strong, safe, at peace
- The sense that awareness itself is untroubled

## Approaching Rewards

- Feeling basically full, the enoughness in this moment as it is
- Feeling pleased, glad, grateful, satisfied
- Therapeutic, spiritual, or existential realizations

## Attaching to Others

- Feeling basically connected
- Feeling included, seen, liked, appreciated, loved
- Feeling compassionate, kind, generous, loving



# Coming Home

# The Brain's Responsive Setting

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*When not invaded by threat, loss, or rejection [no felt deficit or disturbance of safety, satisfaction, and connection]*

The body defaults to a sustainable equilibrium of refueling, repairing, and pleasant abiding.

The mind defaults to a sustainable equilibrium of:

- **Peace** (the Avoiding system)
- **Contentment** (the Approaching system)
- **Love** (the Attaching system)

This is the brain in its homeostatic **Responsive**,  
*minimal craving* mode.

# The Brain's Reactive Setting

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*When invaded by threat, loss, or rejection [felt deficit or disturbance of safety, satisfaction, or connection]:*

The body fires up into the stress response; outputs exceed inputs; long-term building is deferred.

The mind fires up into:

- **Fear** (the Avoiding system)
- **Frustration** (the Approaching system)
- **Heartache** (the Attaching system)

This is the brain in allostatic, **Reactive**, *craving* mode. <sup>58</sup>



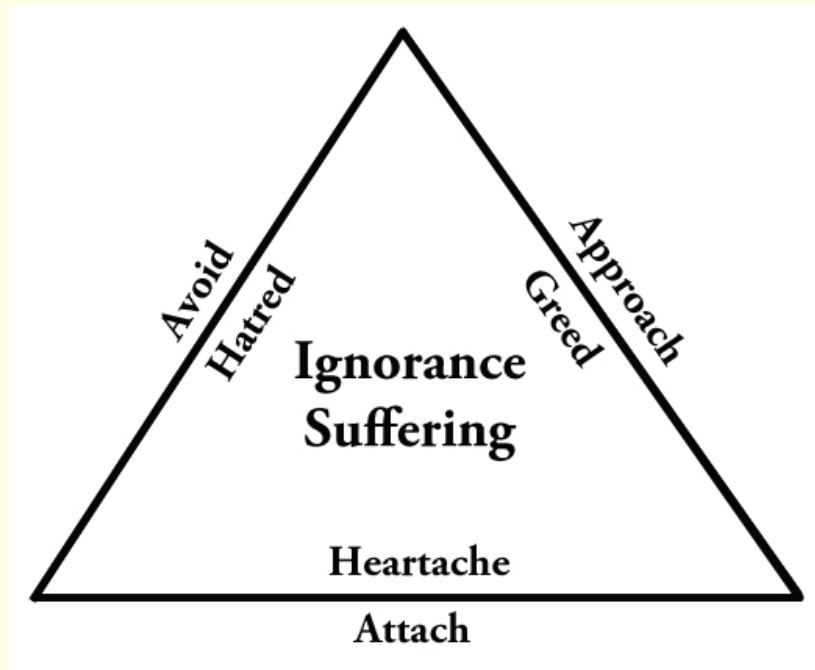




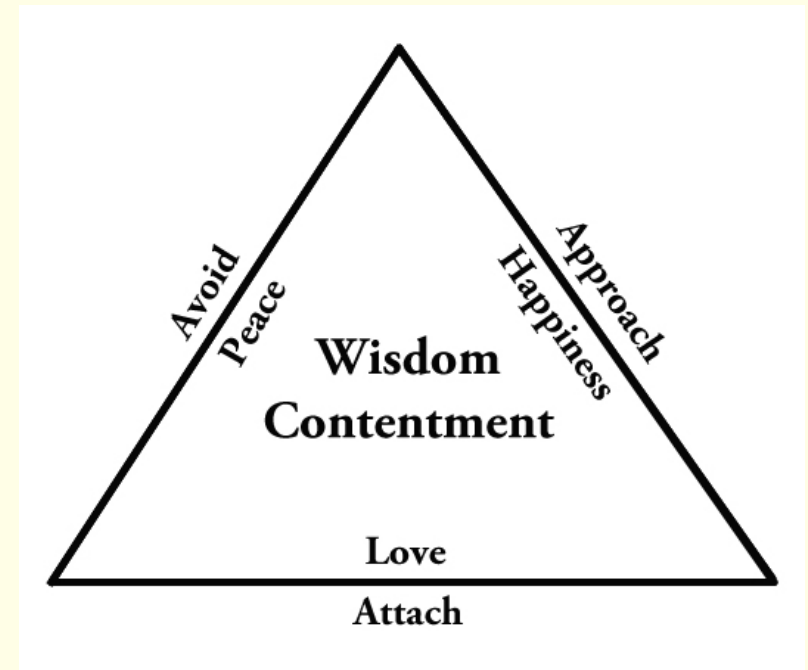
# Choices . . .

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Or?



**Reactive Mode**



**Responsive Mode**

# Coming Home, Staying Home

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**Positive experiences of core needs met - the felt sense of safety, satisfaction, and connection - activate Responsive mode.**

**Activated Responsive states can become installed Responsive traits. Responsive traits foster Responsive states.**

**Responsive states and traits enable us to stay Responsive with challenges.**

A decorative vertical bar in a light olive green color runs along the left edge of the slide. A thin, dark purple horizontal line spans the width of the slide, intersecting the vertical bar. On the right side of this line, there is a small rectangular block composed of two stacked horizontal bars: the top one is dark purple and the bottom one is light gray.

**Peace**

**Contentment**

**Love**

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*Think not lightly of good, saying,  
"It will not come to me."*

*Drop by drop is the water pot filled.*

*Likewise, the wise one,  
gathering it little by little,  
fills oneself with good.*

**Thank you**

# Suggested Books

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See [www.RickHanson.net](http://www.RickHanson.net) for other great books.

- Austin, J. 2009. *Selfless Insight*. MIT Press.
- Begley, S. 2007. *Train Your Mind, Change Your Brain*. Ballantine.
- Carter, C. 2010. *Raising Happiness*. Ballantine.
- Hanson, R. (with R. Mendius). 2009. *Buddha's Brain: The Practical Neuroscience of Happiness, Love, and Wisdom*. New Harbinger.
- Johnson, S. 2005. *Mind Wide Open*. Scribner.
- Keltner, D. 2009. *Born to Be Good*. Norton.
- Kornfield, J. 2009. *The Wise Heart*. Bantam.
- LeDoux, J. 2003. *Synaptic Self*. Penguin.
- Linden, D. 2008. *The Accidental Mind*. Belknap.
- Sapolsky, R. 2004. *Why Zebras Don't Get Ulcers*. Holt.
- Siegel, D. 2007. *The Mindful Brain*. Norton.
- Thompson, E. 2007. *Mind in Life*. Belknap.

# Key Papers - 1

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See [www.RickHanson.net](http://www.RickHanson.net) for other scientific papers.

- Atmanspacher, H. & Graben, P. 2007. Contextual emergence of mental states from neurodynamics. *Chaos & Complexity Letters*, 2:151-168.
- Baumeister, R., Bratlavsky, E., Finkenauer, C. & Vohs, K. 2001. Bad is stronger than good. *Review of General Psychology*, 5:323-370.
- Braver, T. & Cohen, J. 2000. On the control of control: The role of dopamine in regulating prefrontal function and working memory; in *Control of Cognitive Processes: Attention and Performance XVIII*. Monsel, S. & Driver, J. (eds.). MIT Press.
- Carter, O.L., Callistemon, C., Ungerer, Y., Liu, G.B., & Pettigrew, J.D. 2005. Meditation skills of Buddhist monks yield clues to brain's regulation of attention. *Current Biology*, 15:412-413.



# Key Papers - 2

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- Davidson, R.J. 2004. Well-being and affective style: neural substrates and biobehavioural correlates. *Philosophical Transactions of the Royal Society*, 359:1395-1411.
- Farb, N.A.S., Segal, Z.V., Mayberg, H., Bean, J., McKeon, D., Fatima, Z., and Anderson, A.K. 2007. Attending to the present: Mindfulness meditation reveals distinct neural modes of self-reflection. *SCAN*, 2, 313-322.
- Gillihan, S.J. & Farah, M.J. 2005. Is self special? A critical review of evidence from experimental psychology and cognitive neuroscience. *Psychological Bulletin*, 131:76-97.
- Hagmann, P., Cammoun, L., Gigandet, X., Meuli, R., Honey, C.J., Wedeen, V.J., & Sporns, O. 2008. Mapping the structural core of human cerebral cortex. *PLoS Biology*, 6:1479-1493.
- Hanson, R. 2008. Seven facts about the brain that incline the mind to joy. In *Measuring the immeasurable: The scientific case for spirituality*. Sounds True.

# Key Papers - 3

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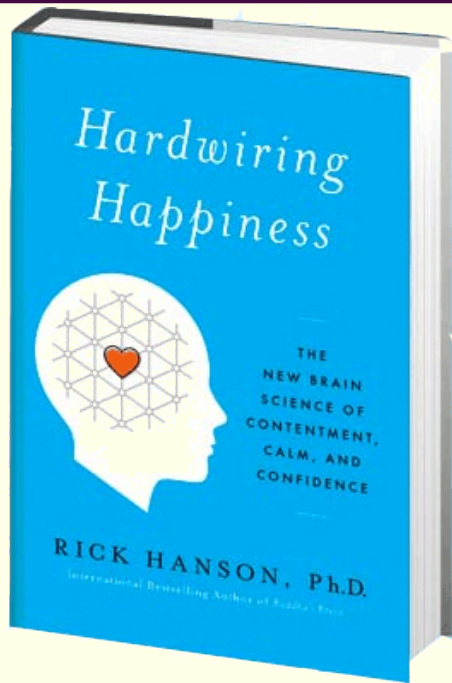
- Lazar, S., Kerr, C., Wasserman, R., Gray, J., Greve, D., Treadway, M., McGarvey, M., Quinn, B., Dusek, J., Benson, H., Rauch, S., Moore, C., & Fischl, B. 2005. Meditation experience is associated with increased cortical thickness. *Neuroreport*, 16:1893-1897.
- Lewis, M.D. & Todd, R.M. 2007. The self-regulating brain: Cortical-subcortical feedback and the development of intelligent action. *Cognitive Development*, 22:406-430.
- Lieberman, M.D. & Eisenberger, N.I. 2009. Pains and pleasures of social life. *Science*, 323:890-891.
- Lutz, A., Greischar, L., Rawlings, N., Ricard, M. and Davidson, R. 2004. Long-term meditators self-induce high-amplitude gamma synchrony during mental practice. *PNAS*, 101:16369-16373.
- Lutz, A., Slager, H.A., Dunne, J.D., & Davidson, R. J. 2008. Attention regulation and monitoring in meditation. *Trends in Cognitive Sciences*, 12:163-169.

# Key Papers - 4

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- Rozin, P. & Royzman, E.B. 2001. Negativity bias, negativity dominance, and contagion. *Personality and Social Psychology Review*, 5:296-320.
- Takahashi, H., Kato, M., Matsuura, M., Mobbs, D., Suhara, T., & Okubo, Y. 2009. When your gain is my pain and your pain is my gain: Neural correlates of envy and schadenfreude. *Science*, 323:937-939.
- Tang, Y.-Y., Ma, Y., Wang, J., Fan, Y., Feng, S., Lu, Q., Yu, Q., Sui, D., Rothbart, M.K., Fan, M., & Posner, M. 2007. Short-term meditation training improves attention and self-regulation. *PNAS*, 104:17152-17156.
- Thompson, E. & Varela F.J. 2001. Radical embodiment: Neural dynamics and consciousness. *Trends in Cognitive Sciences*, 5:418-425.
- Walsh, R. & Shapiro, S. L. 2006. The meeting of meditative disciplines and Western psychology: A mutually enriching dialogue. *American Psychologist*, 61:227-239.

# Where to Find Rick Hanson Online



## ***Hardwiring Happiness: The New Brain Science of Contentment, Calm, and Confidence***

[www.rickhanson.net/hardwiringhappiness](http://www.rickhanson.net/hardwiringhappiness)

Personal website: [www.rickhanson.net](http://www.rickhanson.net)

Wellspring Institute: [www.wisebrain.org](http://www.wisebrain.org)



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