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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.*

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# ***Hardwiring Happiness***

**Nalanda Institute  
For Contemplative Science**

**October 11, 2013**

**Rick Hanson, Ph.D.**

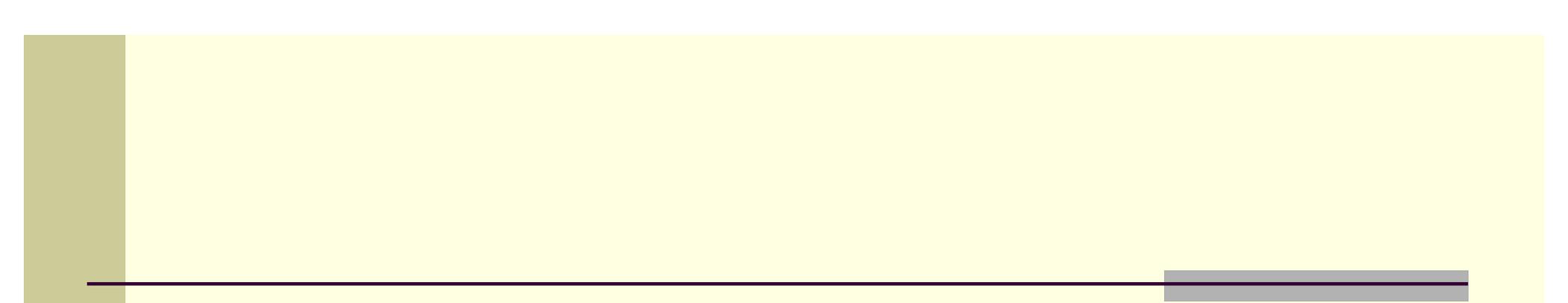
**The Wellspring Institute for Neuroscience and Contemplative Wisdom**

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

# Topics

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- **Grounding the mind in life**
- **Self-directed neuroplasticity**
- **Growing inner strengths**
- **The negativity bias**
- **Taking in the good**
- **Cultivation and craving**



# **Grounding the Mind in Life**

# The Natural Mind

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Apart from the hypothetical influence of a transcendental X factor . . .

Awareness and unconsciousness, mindfulness and delusion, and happiness and suffering must be natural processes.

Mind is grounded in life.

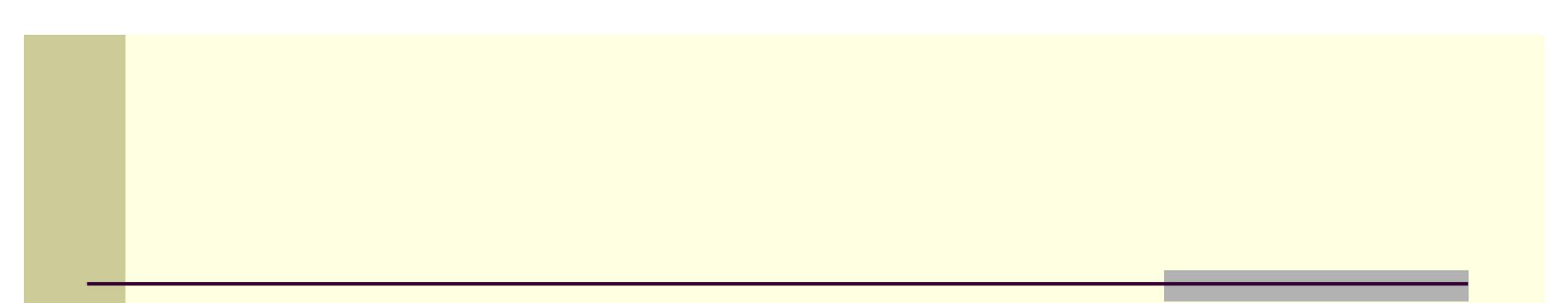
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*"We ask, 'What is a thought?'"*

*We don't know,*

*yet we are thinking continually."*

**Venerable Ani Tenzin Palmo**



# **Self-Directed Neuroplasticity**

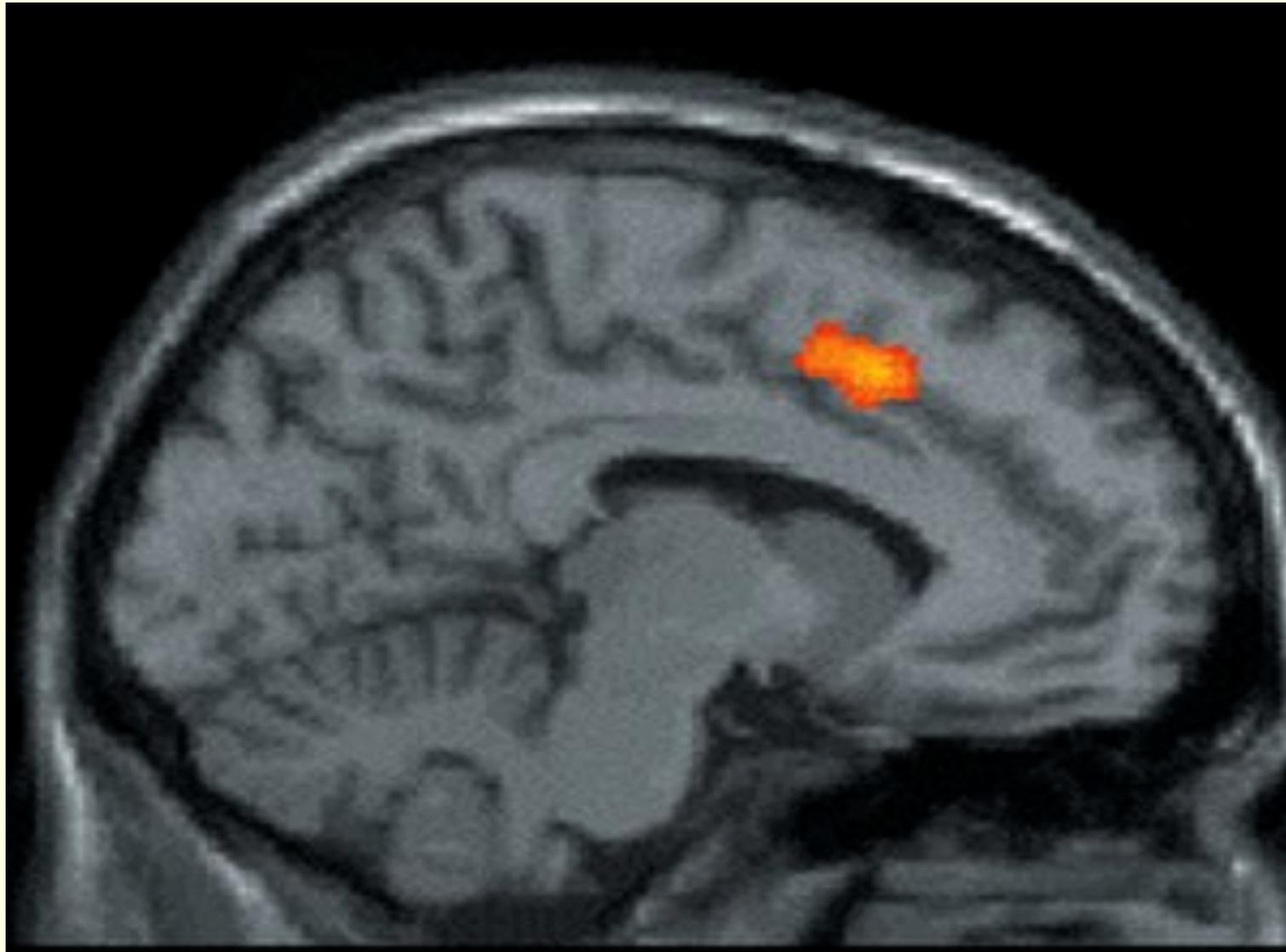


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**Mental activity entails  
underlying neural activity.**

# Ardent, Diligent, Resolute, and Mindful

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**Repeated mental activity entails  
repeated neural activity.**

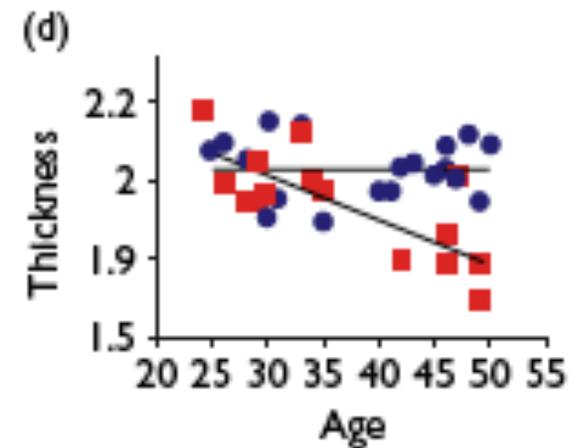
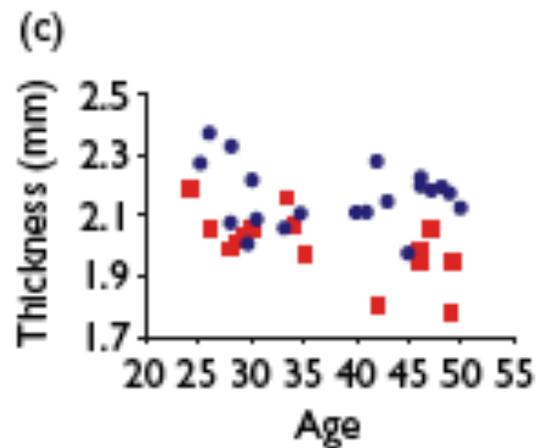
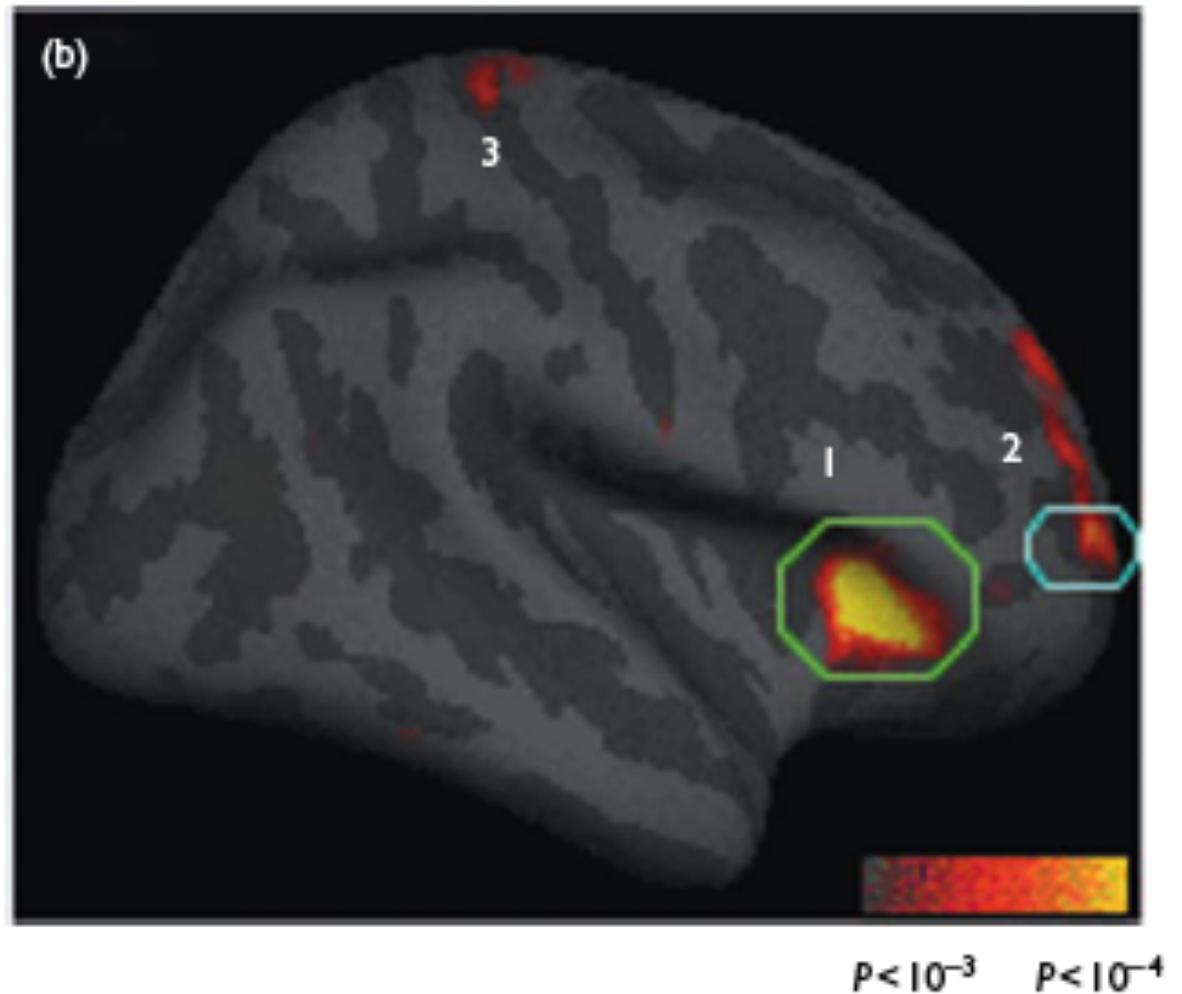
**Repeated neural activity  
builds neural structure.**

A network of glowing yellow neurons with a central neuron highlighted in green. The neurons are interconnected by a dense web of thin, yellow, fiber-like structures. The central neuron has a bright green nucleus and is surrounded by a network of yellow fibers. The background is dark, making the glowing neurons stand out.

**Neurons that fire together,**

**wire together.**

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



# The Activation/Installation Positive Cycle

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**States are temporary, traits are enduring.**

**Activated mental states are the basis for installed neural traits.**

**Positive traits foster positive states.**

**Activated states --> Installed traits -->  
Reactivated states --> Reinforced traits**

# The Opportunity

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**We can use the mind**

**To change the brain**

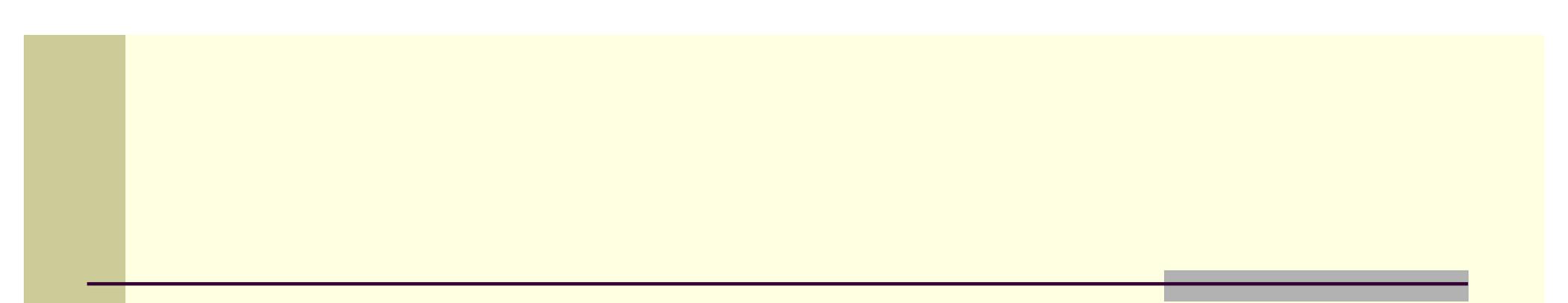
**To change the mind for the better**

**To benefit ourselves and other beings.**

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*If one going down into a river,  
swollen and swiftly flowing,  
is carried away by the current --  
how can one help others across?*

The Buddha



# **Growing Inner Strengths**

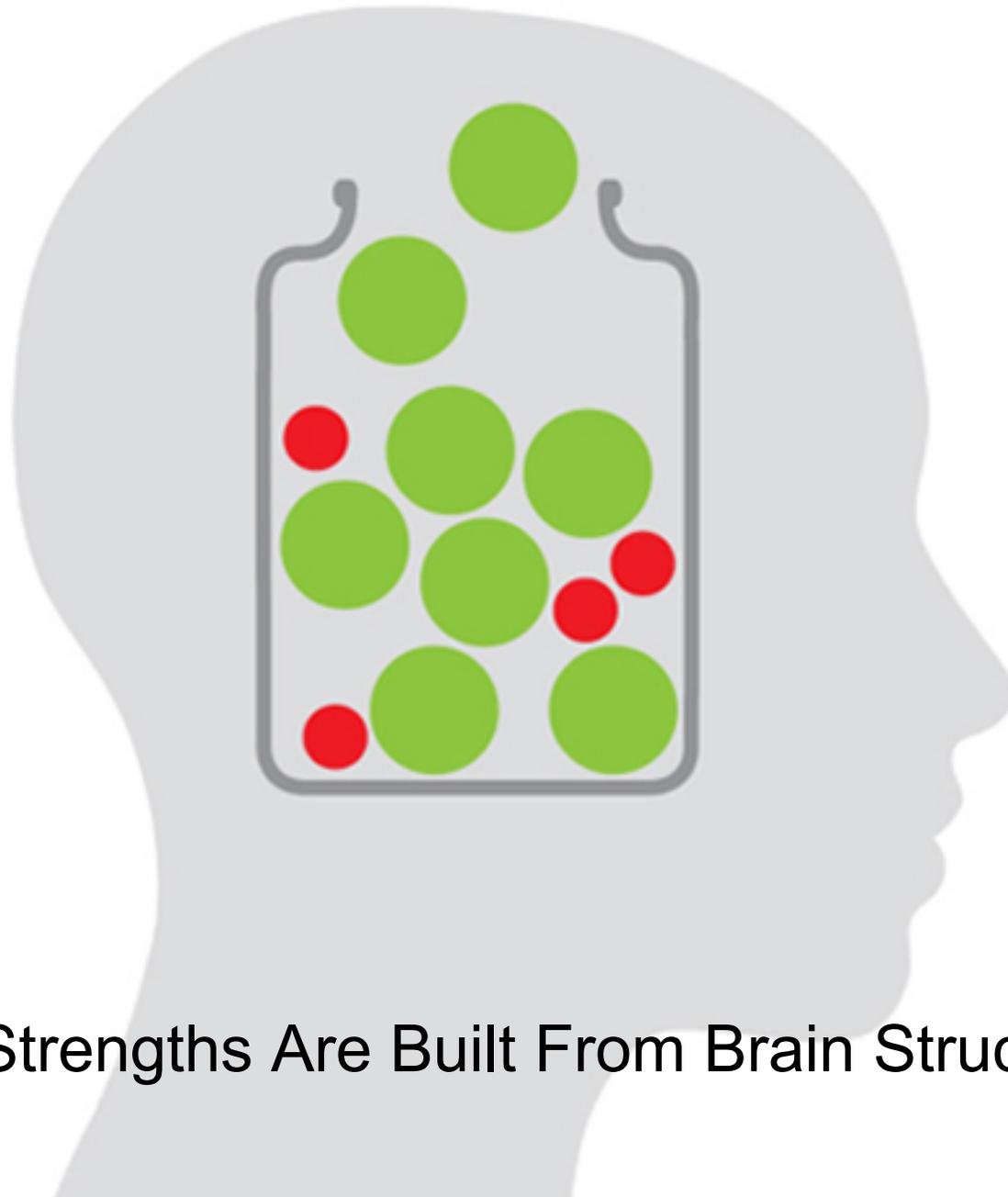
The image is a split-screen comparison of two wolves. The left side shows a close-up of a domesticated wolf, likely a husky, with thick white and grey fur, looking slightly to the right with a calm expression. The right side shows a close-up of a wild wolf, with more rugged, grey and brown fur, looking down and to the left with a more intense, focused expression. The text "Two wolves in the heart" is centered across both images in a white, serif font.

Two wolves in the heart

# Inner Strengths Include

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- **Virtues** (e.g., patience, energy, generosity, restraint)
- **Executive functions** (e.g., meta-cognition)
- **Attitudes** (e.g., optimism, openness, confidence)
- **Capabilities** (e.g., mindfulness, emotional intelligence, resilience)
- **Positive emotions** (e.g., gratitude, self-compassion)
- **Approach orientation** (e.g., curiosity, exploration)



Inner Strengths Are Built From Brain Structure

# The Causes of Inner Strengths

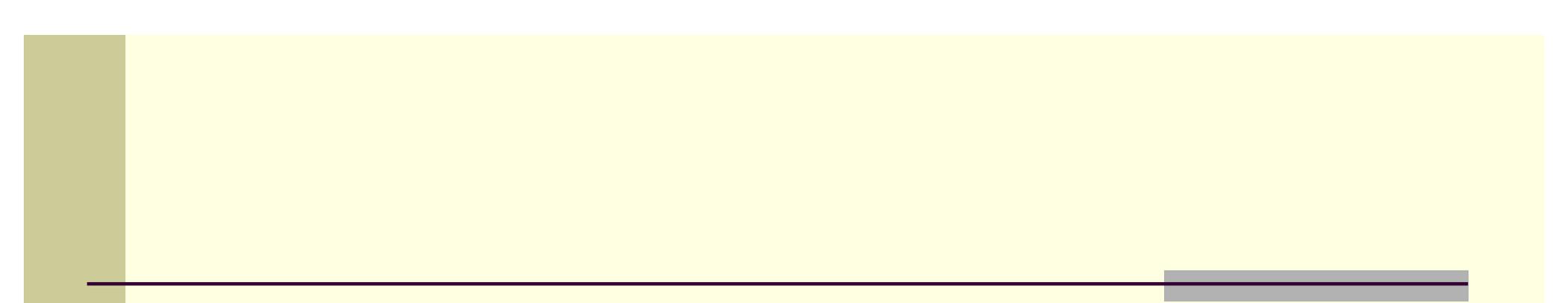
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How do we build the neural traits of inner strengths?

Inner strengths are mainly built from positive experiences.

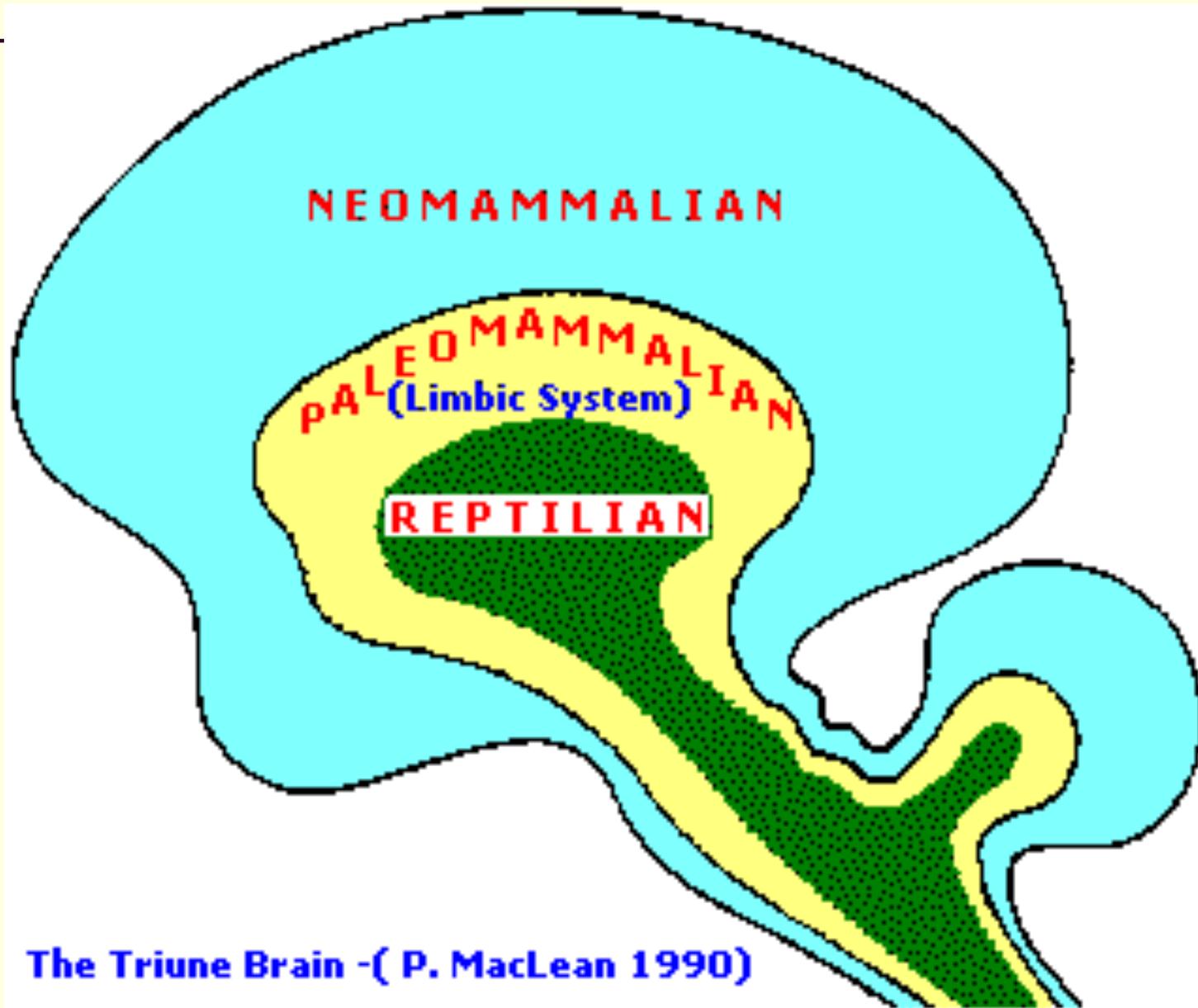
You develop mindfulness by repeatedly being mindful; you develop compassion by repeatedly feeling compassionate; etc.

The brain is like a VCR or DVR, not an iPod: you must play the song to record it - you must experience the strength to install it in your brain.



# The Evolving Brain

# Evolution of the Brain



# Three Motivational and Self-Regulatory Systems

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## ■ Avoid Harms:

- Predators, natural hazards, aggression, pain
- Primary need, tends to trump all others

## ■ Approach Rewards:

- Food, shelter, mating, pleasure
- Mammals: rich emotions and sustained pursuit

## ■ Attach to Others:

- Bonding, language, empathy, cooperation, love
- Taps older Avoiding and Approaching networks

Each system can draw on the other two for its ends.<sup>24</sup>

# The Homeostatic Home Base

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

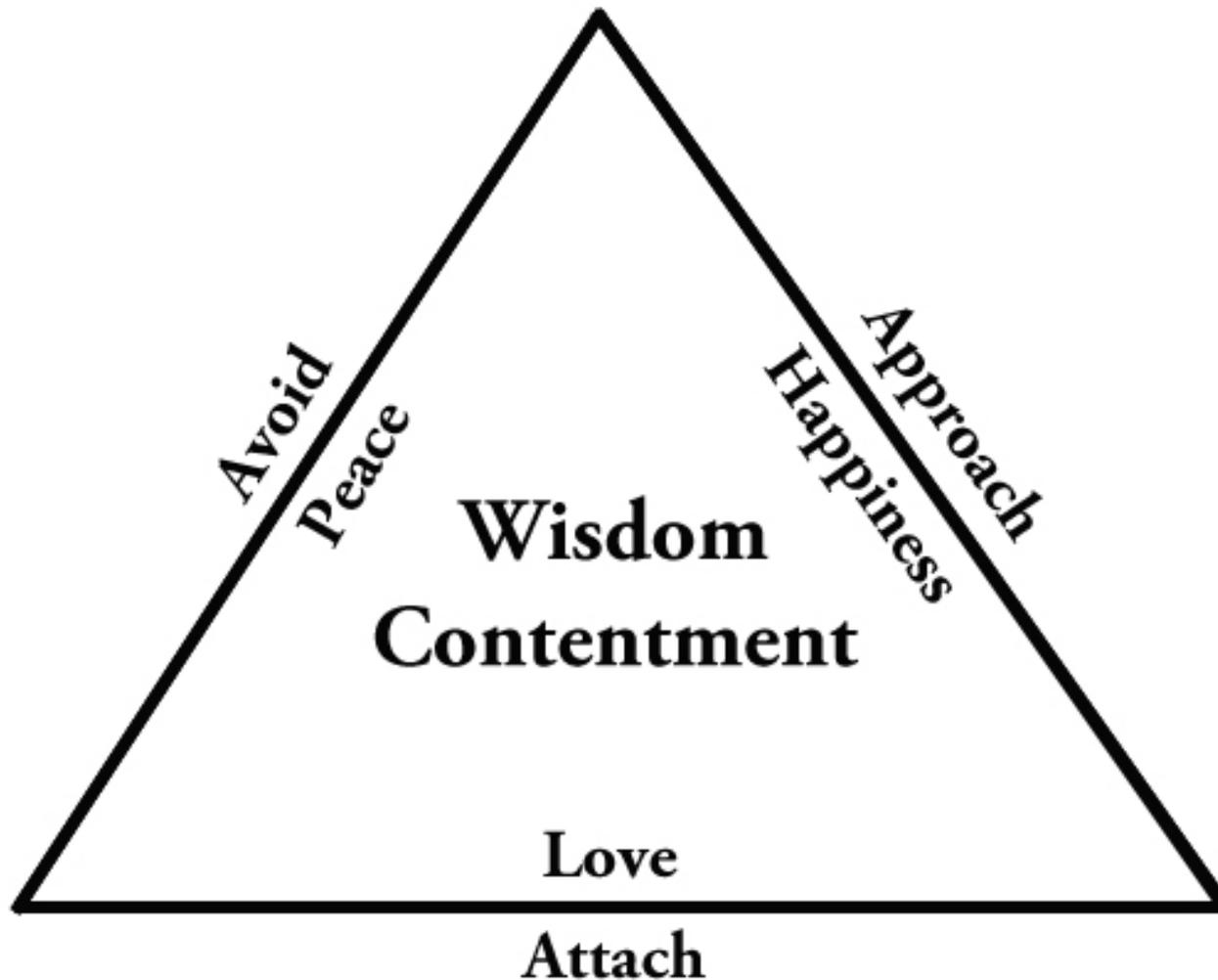
The body defaults to a sustainable equilibrium of refueling, repairing, and pleasant abiding.

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 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.**

# Neurobiological Basis of Craving

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

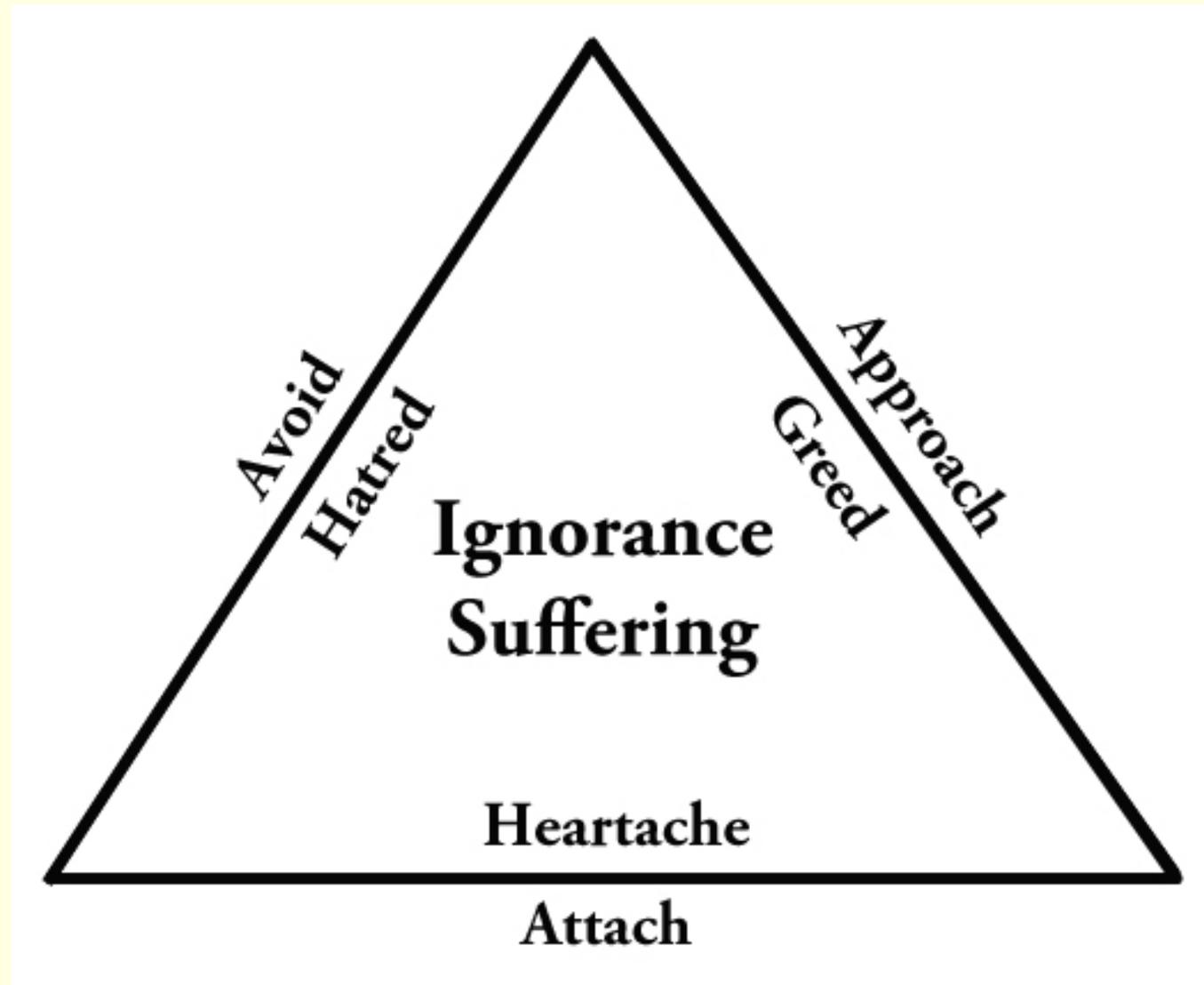
The body fires up into the stress response; outputs exceed inputs; long-term building is deferred.

The mind fires up into:

- **Hatred** (the Avoiding system)
- **Greed** (the Approaching system)
- **Heartache** (the Attaching system)

This is the brain in allostatic, **Reactive**, *craving* mode.<sup>28</sup>

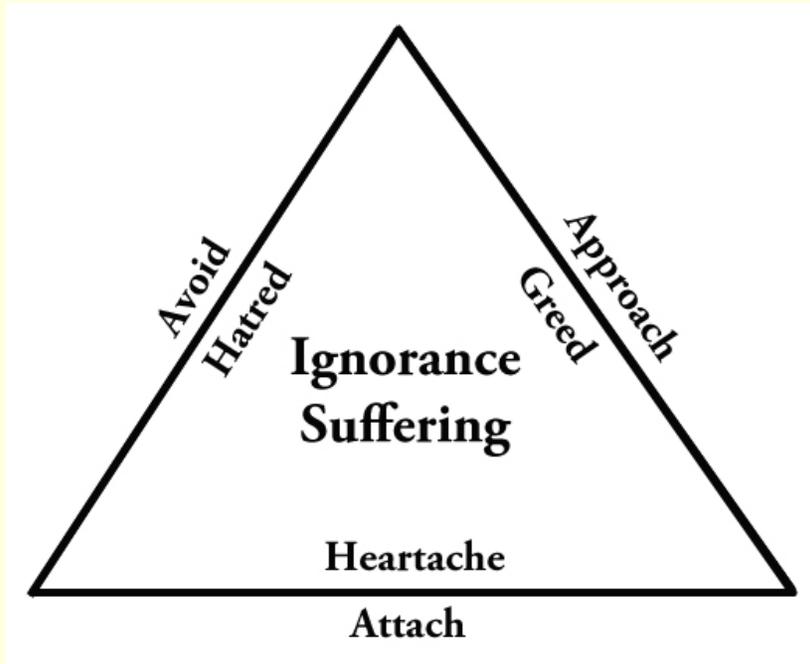
# The Reactive Mode



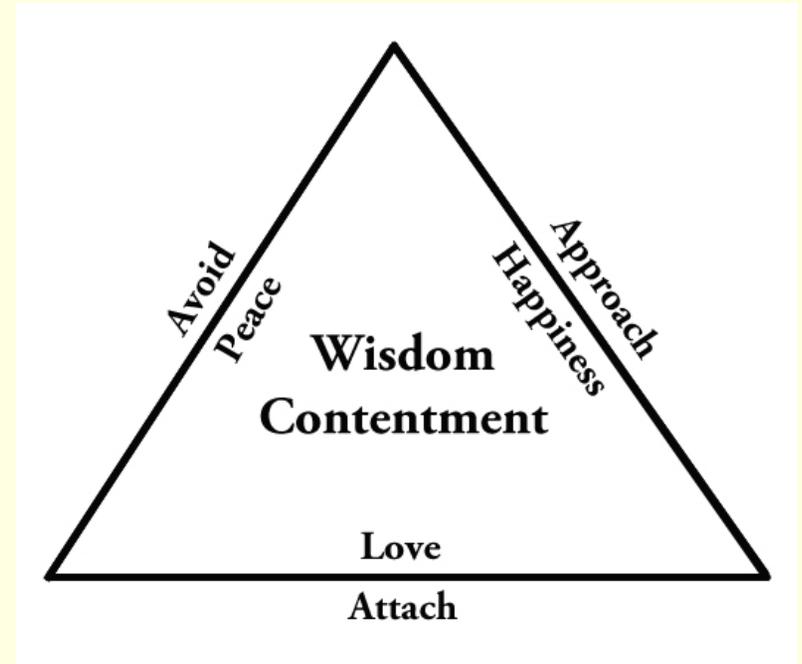
# Choices . . .

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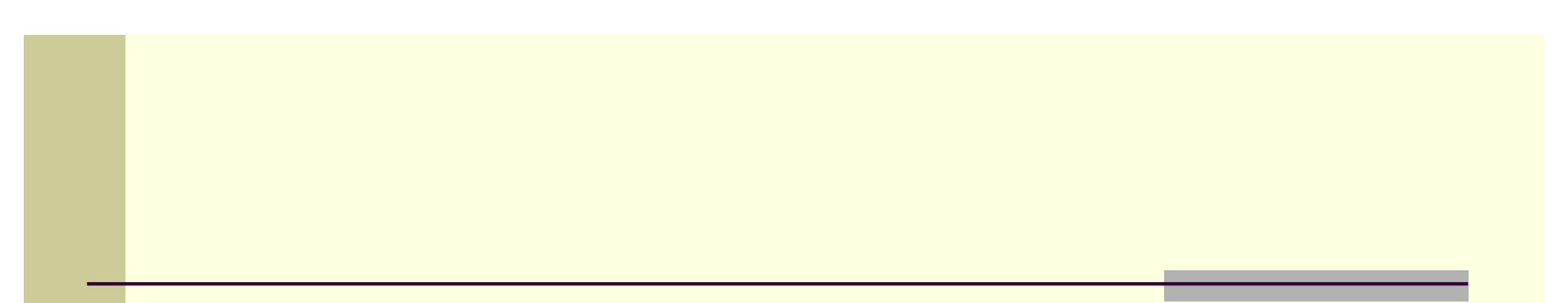
Or?



**Reactive Mode**



**Responsive Mode**



# **The Negativity Bias**

# The Brain's Negativity Bias

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- As our ancestors evolved, avoiding “sticks” was more important for survival than getting “carrots.”
- Negative stimuli:
  - More attention and processing
  - Greater motivational focus: loss aversion
- Preferential encoding in implicit memory:
  - We learn faster from pain than pleasure.
  - Negative interactions: more impactful than positive
  - Easy to create learned helplessness, hard to undo
  - Rapid sensitization to negative through cortisol

# Velcro for Bad, Teflon for Good

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The negativity bias

bad experiences

good experiences

# A Bottleneck For Growing Inner Strengths

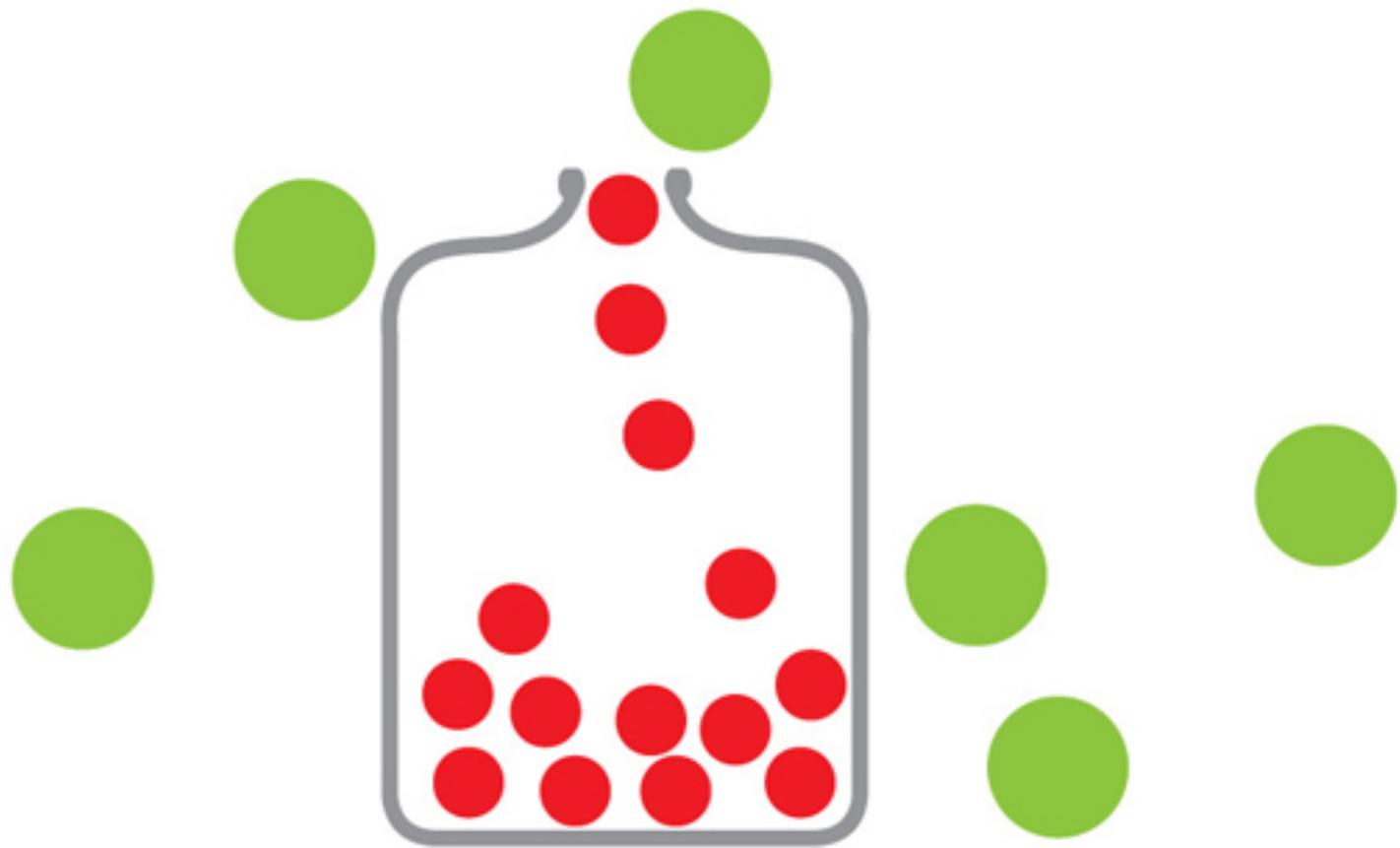
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Unfortunately, the brain is inefficient at turning positive experiences into neural structure.

This design feature of the brain creates a kind of bottleneck that reduces the conversion of positive mental states to positive neural traits.

Most positive experiences are wasted on the brain.

This is the fundamental weakness in psychotherapy, mindfulness training, character education, human resources training, and informal efforts at growth.



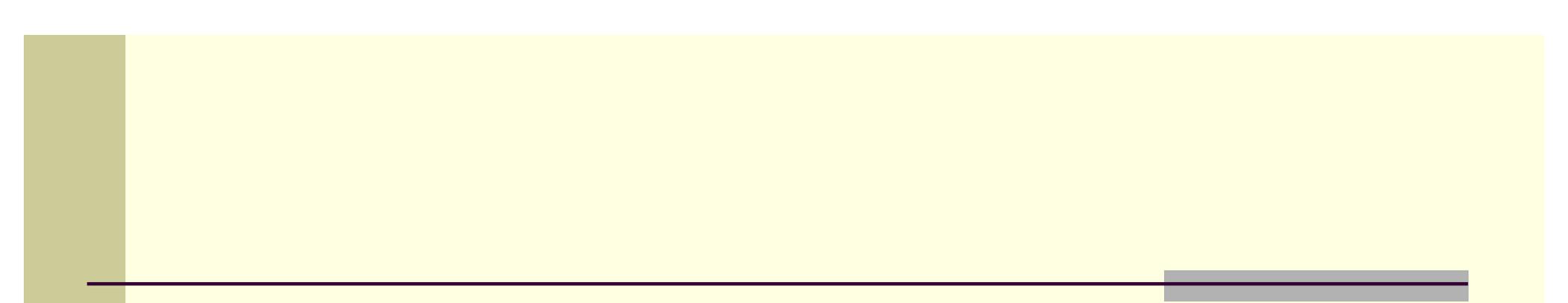
The Negativity Bias

A composite image showing Stone Age people in a modern city park. In the background, there are tall, modern apartment buildings. In the foreground, three Stone Age people are crouching in a grassy field. The central figure is a man with long, dark hair and a beard, wearing a simple, dark, animal-skin garment. He is looking directly at the camera. To his left, another man is crouching, and to his right, a woman is crouching, both also wearing simple, animal-skin garments. The scene is set in a lush, green park with many trees and bushes. The overall image is a juxtaposition of ancient and modern environments.

# Stone age brains in the 21st century

---

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



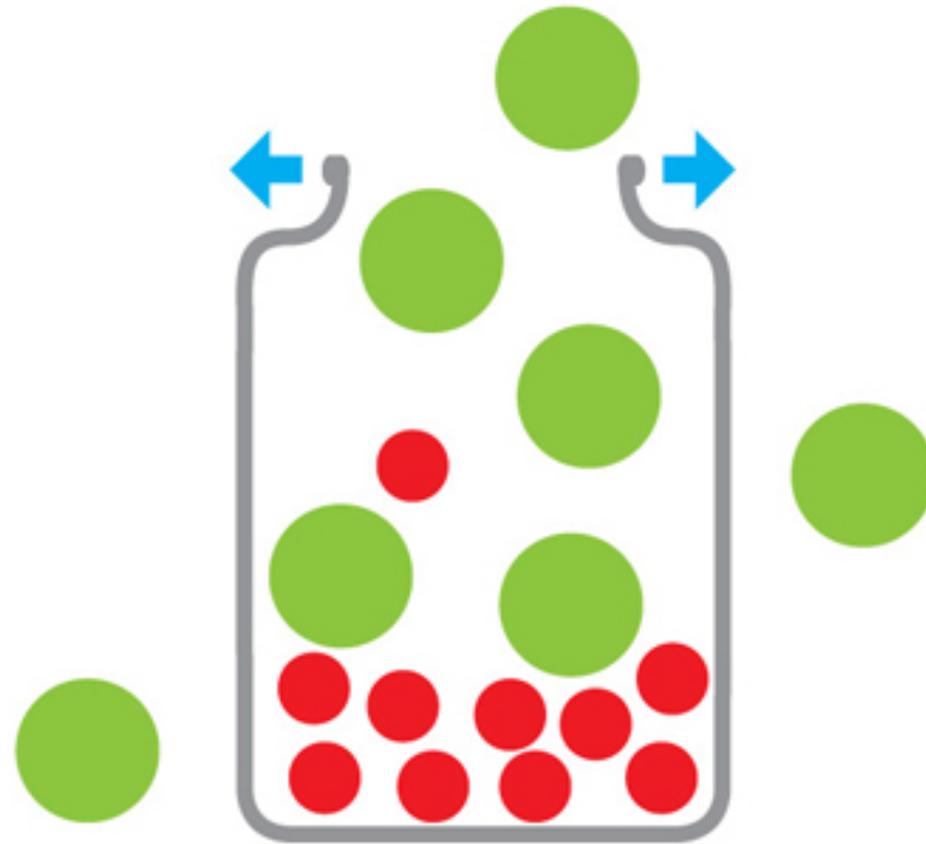
# **Taking in the Good**

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**Just having positive experiences is not enough.**

**They pass through the brain like water through a sieve, while negative experiences are caught.**

**We need to engage positive experiences actively to weave them into the brain.**



Learning to Take in the Good

# HEAL by Taking in the Good

---

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]

# Let's Try It

---

- **Notice** the experience already present in awareness that you are alright right now
  - Have the experience
  - Enrich it
  - Absorb it
  
- **Create** the experience of compassion
  - Have the experience - bring to mind someone you care about . . . Feel caring . . . Wish that he or she not suffer . . . Open to compassion
  - Enrich it
  - Absorb it

# It's Good to Take in the Good

---

- Development of specific inner strengths
  - General - resilience, positive mood, feeling loved
  - “Antidote experiences” - Healing old wounds, filling the hole in the heart
- Implicit benefits:
  - Shows that there is still good in the world
  - Being active rather than passive
  - Treating yourself kindly, like you matter
  - Rights an unfair imbalance, given the negativity bias
  - Training of attention and executive functions
- Sensitizes brain to positive: like Velcro for good

---

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

Lao Tsu

# Targets of TG

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- **Thoughts** - expectations; object relations; perspectives on self, world, past and future
- **Perceptions** - sensations; relaxation; vitality
- **Emotions** - both feelings and mood
- **Desires** - values, aspirations, passions, wants
- **Behaviors** - repertoire; inclinations

# 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

# Some Major Buddhist States/Traits

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**Mindfulness**

**Investigation**

**Energy**

**Bliss**

**Tranquility**

**Concentration**

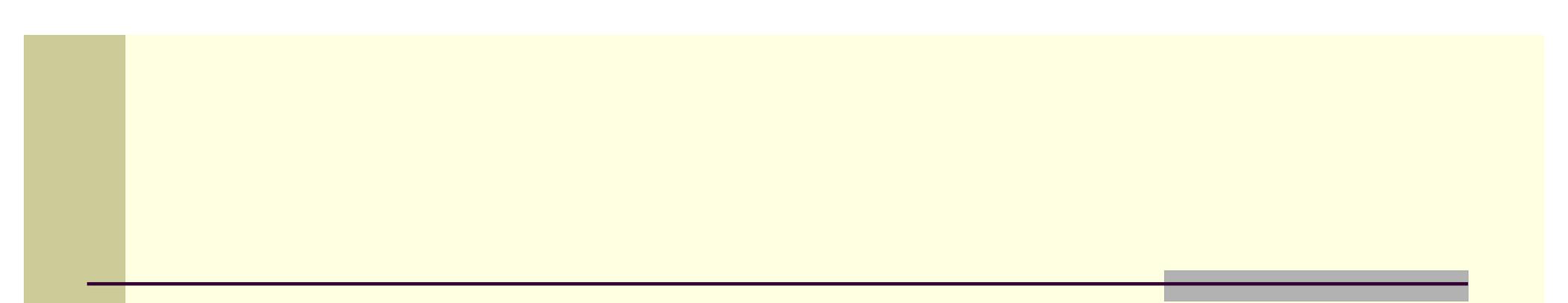
**Equanimity**

**Conviction**

**Compassion**

**Kindness**

**Altruistic joy**



# **Cultivation and Craving**

# Cultivation in Context

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- Three ways to engage the mind:
  - Be with it. Decrease negative. Increase positive.
  - The garden: Observe. Pull weeds. Plant flowers.
  - Let be. Let go. Let in.
  - Mindfulness present in all three ways to engage mind
- While “being with” is primary, it’s often isolated and privileged in mindfulness-based practices.
- Skillful means for decreasing the negative and increasing the positive have developed over 2500 years. Why not use them?



# SPIRIT ROCK MEDITATION CENTER



Join us for

**Cultivating Inner Strength - Monastic  
Daylong [Dana - No Fee Day]**

with Ayya Anandabodhi  
and Ayya Santacitta

on

**Sunday, July 8**

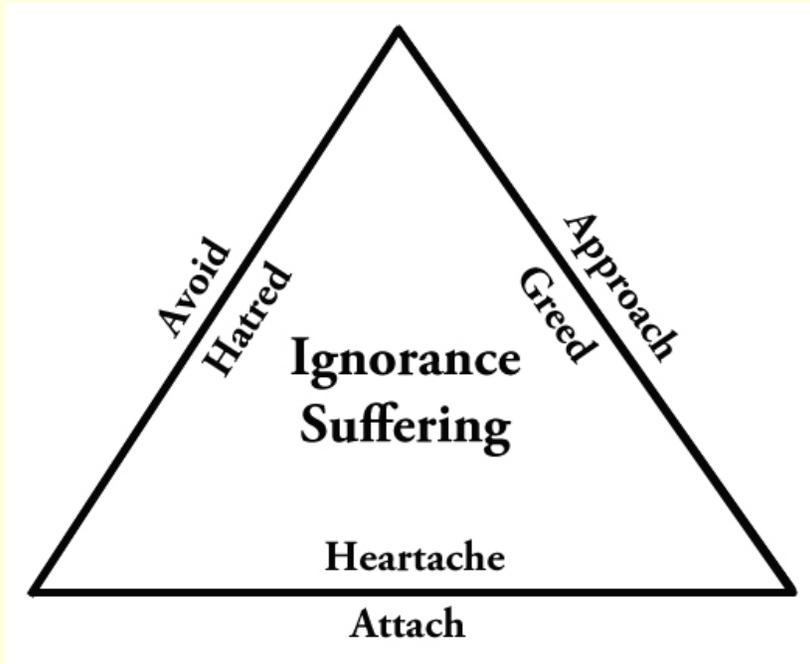
from 9:30 am - 5 pm.

(Photo by Ed Ritger)

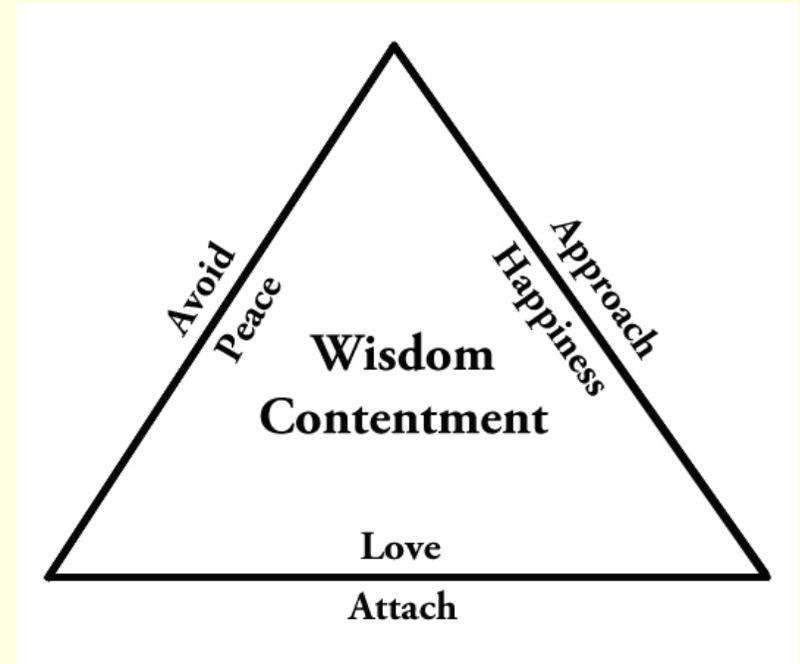
# Choices . . .

---

Or?



**Reactive Mode**



**Responsive Mode**

# Cultivation Undoes Craving

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- All life has goals. The brain continually seeks to avoid harms, approach rewards, and attach to others - even that of a Buddha.
- It is wholesome to wish for the happiness, welfare, and awakening of all beings - including the one with your nametag.
- We rest the mind upon positive states so that the brain may gradually take their shape. This disentangles us from craving as we increasingly rest in a peace, happiness, and love that is independent of external conditions.
- With time, even the practice of cultivation falls away - like a raft that is no longer needed once we reach the farther shore.

# A Fifth Yana?

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The “Buddhastream” has developed through four major vehicles (*yanas*): Theravadan, Tibetan, Chan/Zen, and Pure Land.

Could we be helping develop an emergent Fifth Yana, with:

- Many householders engaging deep contemplative practice
- Multiculturalism as both a reality and a value
- Access to and eclectic use of the full array of Buddhist teachings
- Flattening hierarchies
- Naturalizing dharma practice; using science and psychology
- Skillful use of positive experiences; “Western tantra”
- Deconstructing and applying Buddhist practices in non-Buddhist settings (e.g., pain-control clinics, schools, psychotherapy)

# Heartwood

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*This spiritual life does not have gain, honor, and renown for its benefit, or the attainment of moral discipline for its benefit, or the attainment of concentration for its benefit, or knowledge and vision for its benefit.*

*But it is this unshakable liberation of mind that is the goal of this spiritual life, its heartwood, and its end.*

# The Fruit as the Path

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**Peace**

**Contentment**

**Love**

## **“Bahiya, you should train yourself thus.”**

---

*In reference to the seen, there will be only the seen. To the heard, only the heard. To the sensed, only the sensed. To the cognized, only the cognized.*

*When for you there will be only the seen in the seen, only the heard in the heard, only the sensed in the sensed, only the cognized in the cognized, then, Bahiya, there's no you in that.*

*When there's no you in that, there's no you there. When there's no you there, you are neither here nor yonder nor between the two.*

*This, just this, is the end of all suffering.*

---

*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.*

# Great Books

---

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.
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# 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.
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- 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. 60

# Key Papers - 3

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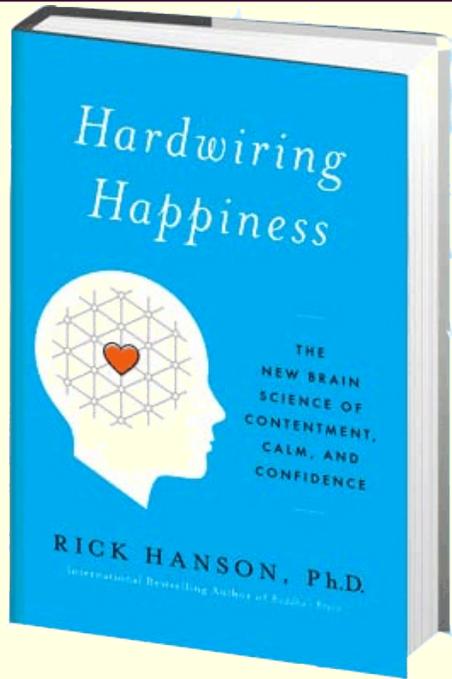
- Lazar, S., Kerr, C., Wasserman, R., Gray, J., Greve, D., Treadway, M., McGarvey, M., Quinn, B., Dusek, J., Benson, H., Rauch, S., Moore, C., & Fischl, B. 2005. Meditation experience is associated with increased cortical thickness. *Neuroreport*, 16:1893-1897.
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*Where 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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