Taking in the Good:

Building Resilience into the Brain Through Positive Experiences

Living and Leading with Resilience Conference

George Mason University, April 13, 2012

Rick Hanson, Ph.D.

The Wellspring Institute for Neuroscience and Contemplative Wisdom

WiseBrain.org RickHanson.net

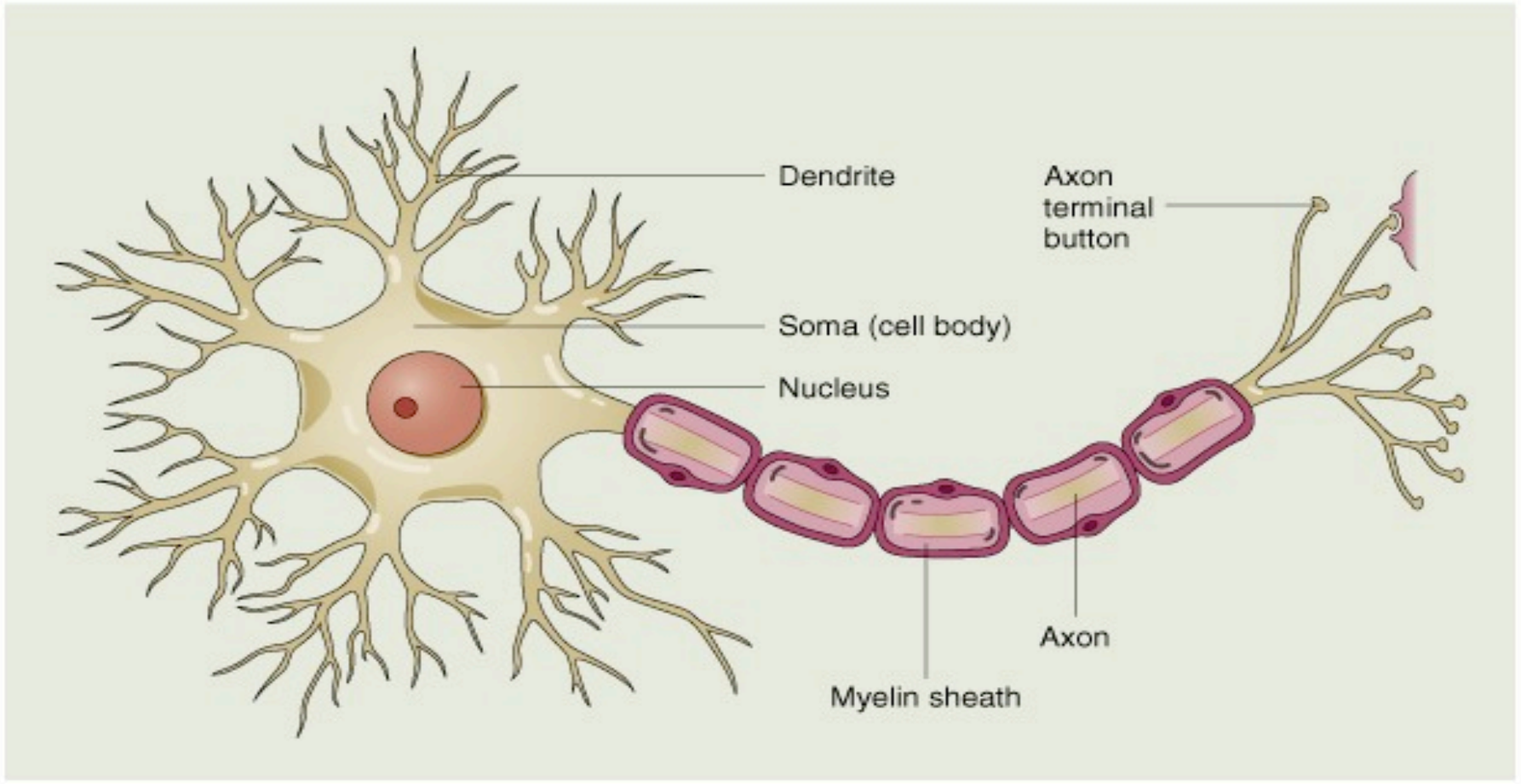
drrh@comcast.net

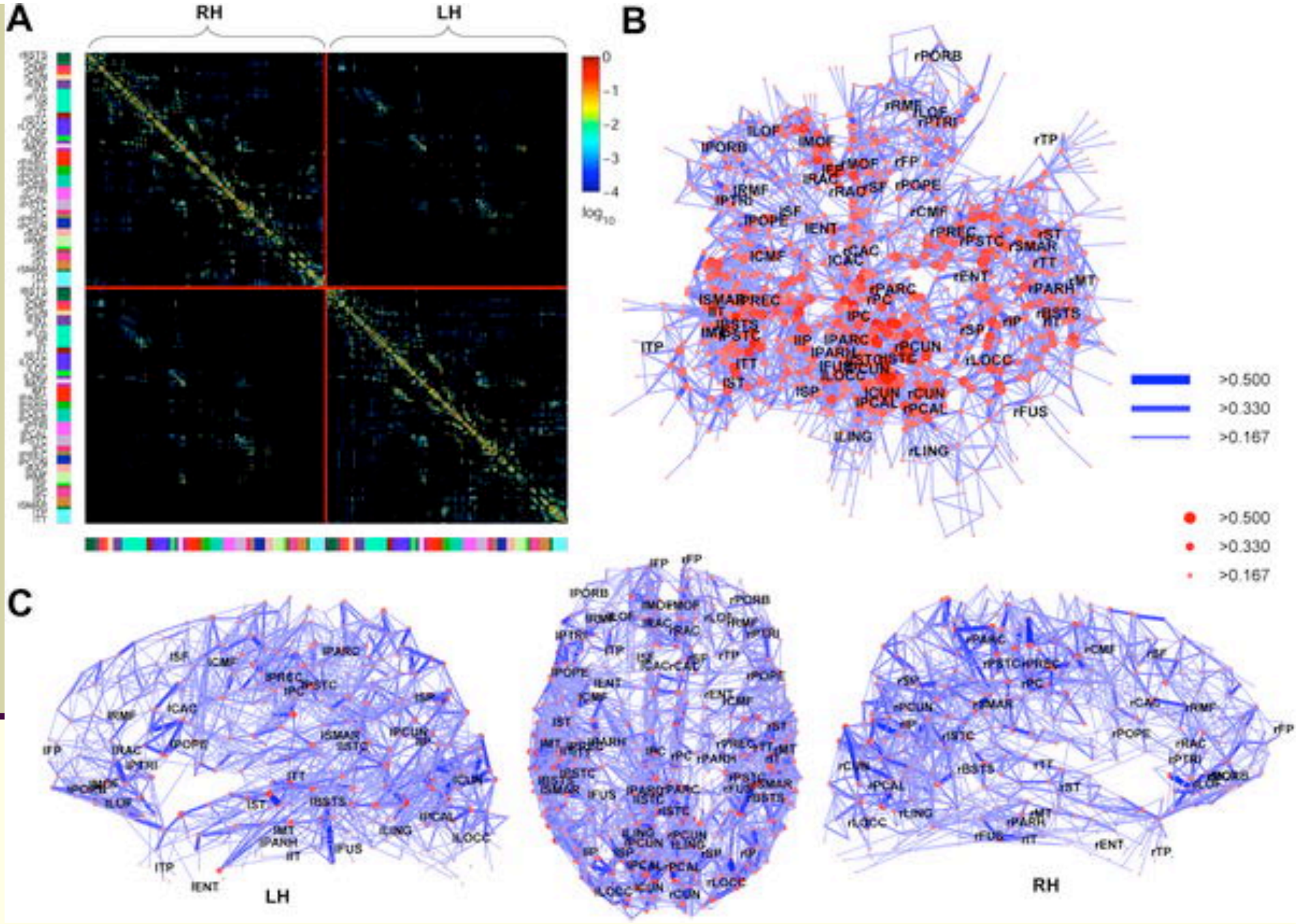
Topics

- Self-directed neuroplasticity
- Controlling attention
- Taking in the good
- Coming home to the naturally resilient brain

Self-Directed Neuroplasticity

A Neuron




A
RH
LH
0
-1
-2
-3
-4
log10
B
>0.500
>0.330
>0.167
>0.500
>0.330
>0.167
C
LH
RH

All cells have specialized functions. Brain cells have particular ways of processing information and communicating with each other. Nerve cells form complete circuits that carry and transform information.

Electrical signaling represents the language of mind, the means whereby nerve cells, the building blocks of the brain, communicate with one another over great distances. Nerve cells generate electricity as a means of producing messages.

All animals have some form of mental life that reflects the architecture of their nervous system.

Eric R. Kandel

Fact #1

<u>As your brain changes, your mind changes</u>.

Ways That Brain Can Change Mind

- For better:
  - A little caffeine: more alertness
  - Thicker insula: more self-awareness, empathy
  - More left prefrontal activation: more happiness

- For worse:
  - Intoxication; imbalances in neurotransmitters
  - Concussion, stroke, tumor, Alzheimer's
  - Cortisol-based shrinkage of hippocampus: less capacity for contextual memory

Fact #2

As your mind changes, your brain changes.

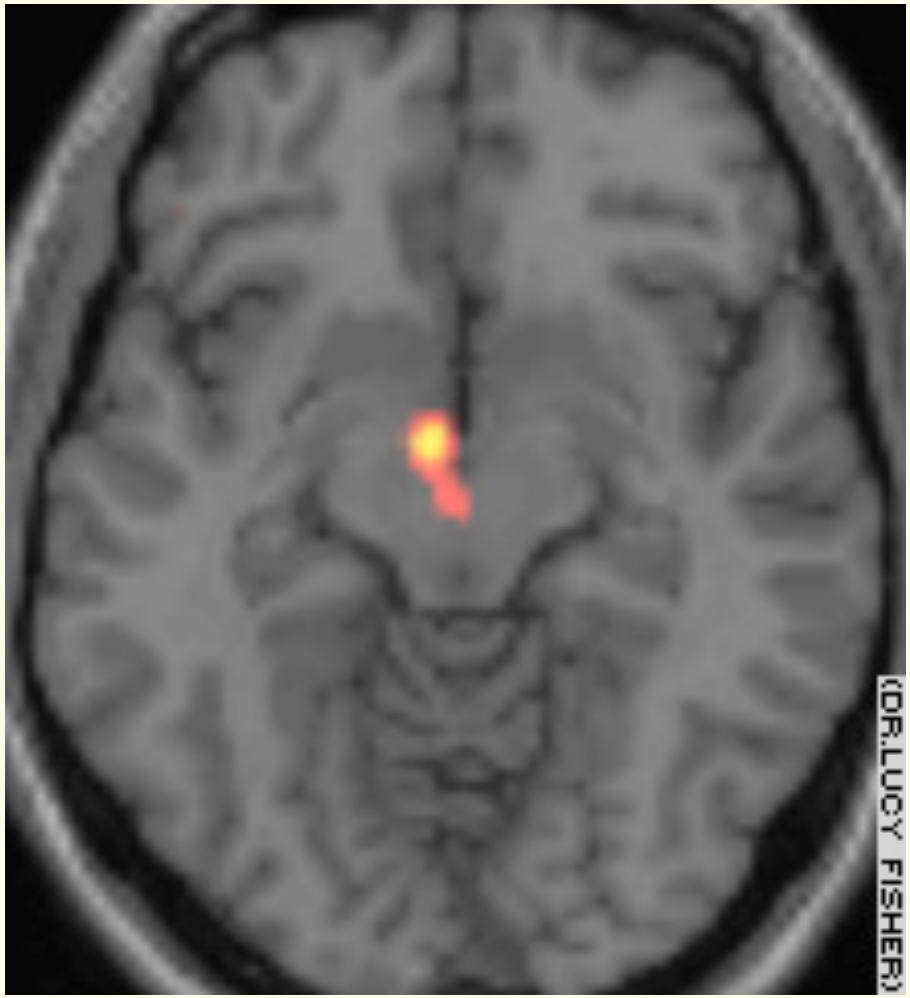
Immaterial mental activity maps to material neural activity.

This produces temporary changes in your brain and lasting ones.

Temporary changes include:

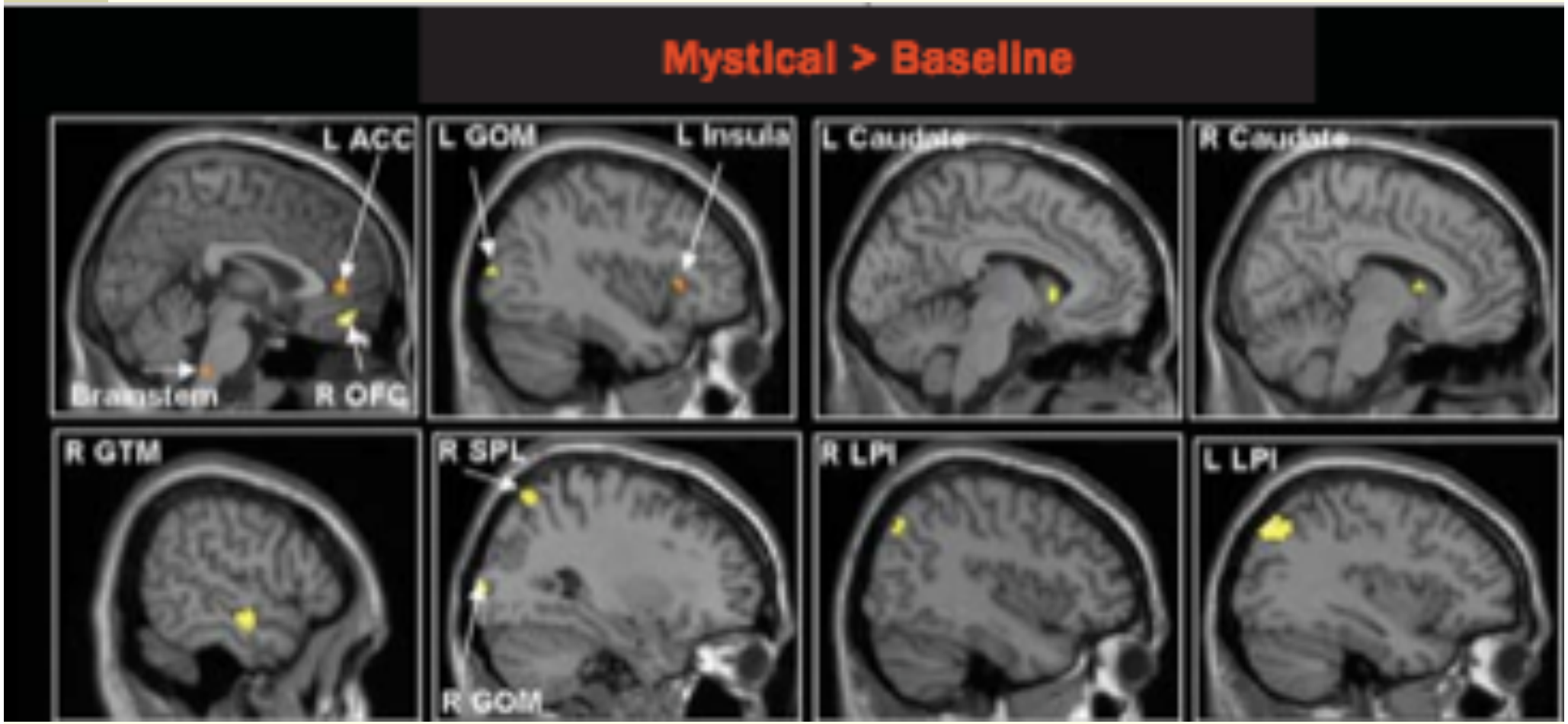
- Alterations in brainwaves (= changes in the firing patterns of synchronized neurons)
- Increased or decreased use of oxygen and glucose
- Ebbs and flows of neurochemicals

The Rewards of Love



Tibetan Monk, Boundless Compassion

Christian Nuns, Recalling Profound Spiritual Experiences

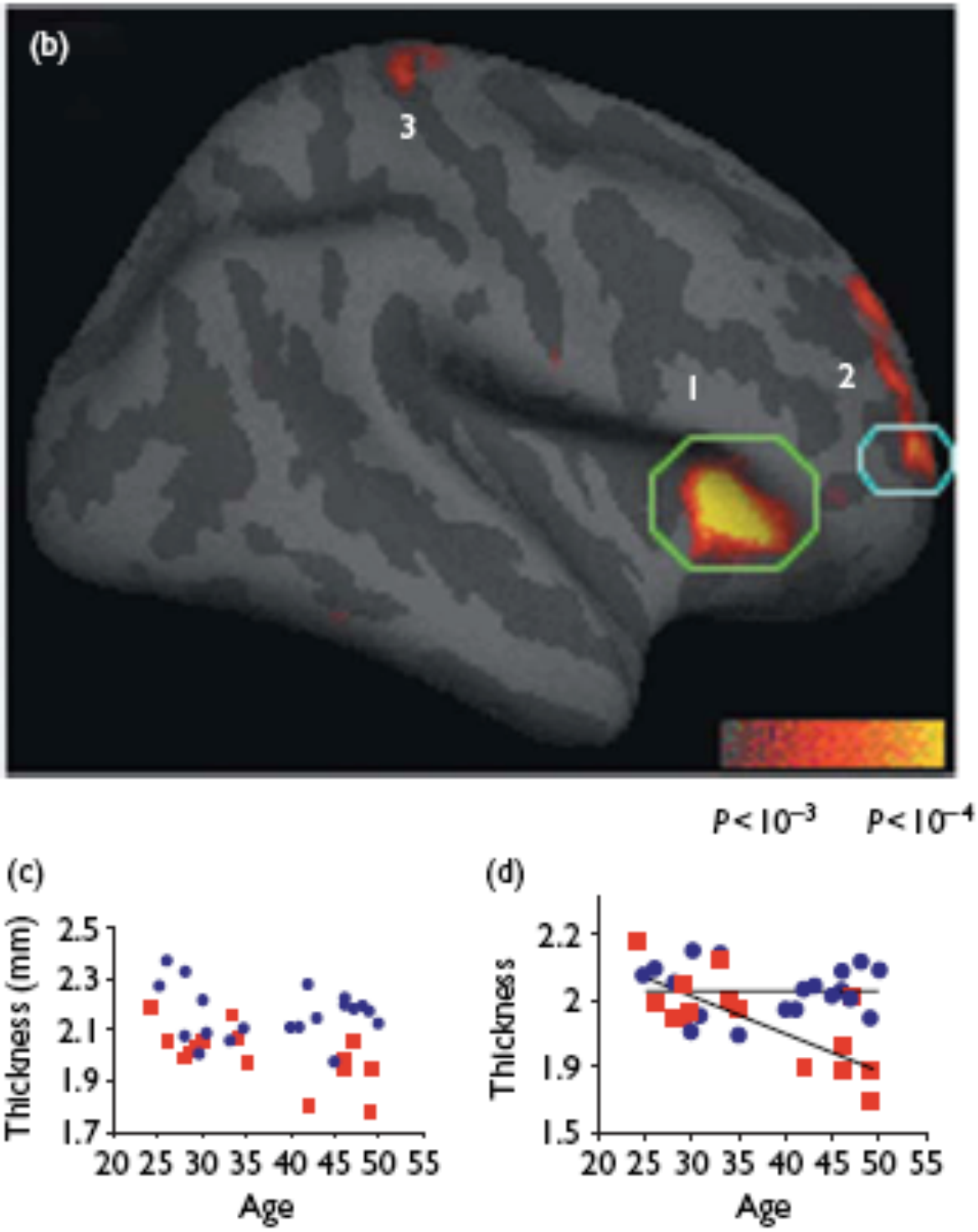


Beauregard, et al., *Neuroscience Letters,* 9/25/06

Mind Changes Brain in Lasting Ways

- What flows through the mind sculpts your brain. Immaterial experience leaves material traces behind.
- Increased blood/nutrient flow to active regions
- Altered epigenetics (gene expression)
- “Neurons that fire together wire together.”
  - Increasing excitability of active neurons
  - Strengthening existing synapses
  - Building new synapses; thickening cortex
  - Neuronal “pruning” - “use it or lose it”

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



Honoring Experience

One's experience *matters*.

Both for how it feels in the moment
and for the lasting residues it leaves behind,
woven into the fabric of a person's brain and being.

Fact #3

You can use your mind
to change your brain
to change your mind for the better.

This is self-directed neuroplasticity.

How to do this, in skillful ways?

Controlling Attention

Why Attention Matters

- In the “stage” of awareness, attention is like a spotlight, illuminating what it rests upon.
- Because neuroplasticity is heightened for what we pay attention to, attention is also like a vacuum cleaner, sucking its contents into the brain.
- Directing attention skillfully is therefore a fundamental way to shape the brain - and one’s life - over time.

The education of attention
would be the education par excellence.

William James

Taking in the Good

The Importance of Inner Resources

- Examples:
  - Freud's "positive introjects"
  - Intrapersonal factors/processes of resilience, such as: learned optimism, emotional intelligence, "ego strength," self-worth, determination, problem-solving skills, and personally meaningful spirituality

- Benefits
  - Lift mood and increase positive emotions: many physical and mental health benefits
  - Improve self-regulation
  - Improve outlook on world, self, and future
  - Increase resilience

How to Take in the Good

1. Look for positive **facts,** and let them become positive experiences.

2. Savor the positive experience:
   - Sustain it for 10-20-30 seconds.
   - Feel it in your body and emotions.
   - Intensify it.

3. Sense and intend that the positive experience is soaking into your brain and body - registering deeply in emotional memory.

Targets of TIG

- Bodily states - healthy arousal; PNS; vitality
- Emotions - both feelings and mood
- Views - expectations; object relations; perspectives on self, world, past and future
- Behaviors - reportoire; inclinations

Kinds of "Good" to Take in

- The small pleasures of ordinary life
- The satisfaction of attaining goals or recognizing accomplishments - especially small, everyday ones
- Feeling grateful, contented, and fulfilled

- Things are alright; nothing is wrong; there is no threat
- Feeling safe and strong
- The peace and relief of forgiveness

- Being included, valued, liked, respected, loved by others
- The good feelings that come from being kind, fair, generous
- Feeling loving

- Recognizing your positive character traits
- Spiritual or existential realizations

Psychological Antidotes

Avoiding Harms

- Strength, efficacy --> Weakness, helplessness, pessimism
- Safety, security --> Alarm, anxiety
- Compassion for oneself and others --> Resentment, anger

Approaching Rewards

- Satisfaction, fulfillment --> Frustration, disappointment
- Gladness, gratitude --> Sadness, discontentment, “blues”

Attaching to “Us”

- Attunement, inclusion --> Not seen, rejected, left out
- Recognition, acknowledgement --> Inadequacy, shame
- Friendship, love --> Abandonment, feeling unloved or unlovable

Why It's Good to Take in the Good

- Rights an unfair imbalance, given the negativity bias
- Gives oneself today the caring and support one should have received as a child, but perhaps didn't get in full measure; an inherent, implicit benefit
- Increases positive resources, such as:
  - Positive emotions
  - Capacity to manage stress and negative experiences
- Can help bring in missing "supplies" (e.g., love, strength, worth)
- Can help painful, even traumatic experiences

The good life, as I conceive it, is a happy life.

I do not mean that if you are good you will be happy;
I mean that if you are happy you will be good.

Bertrand Russell

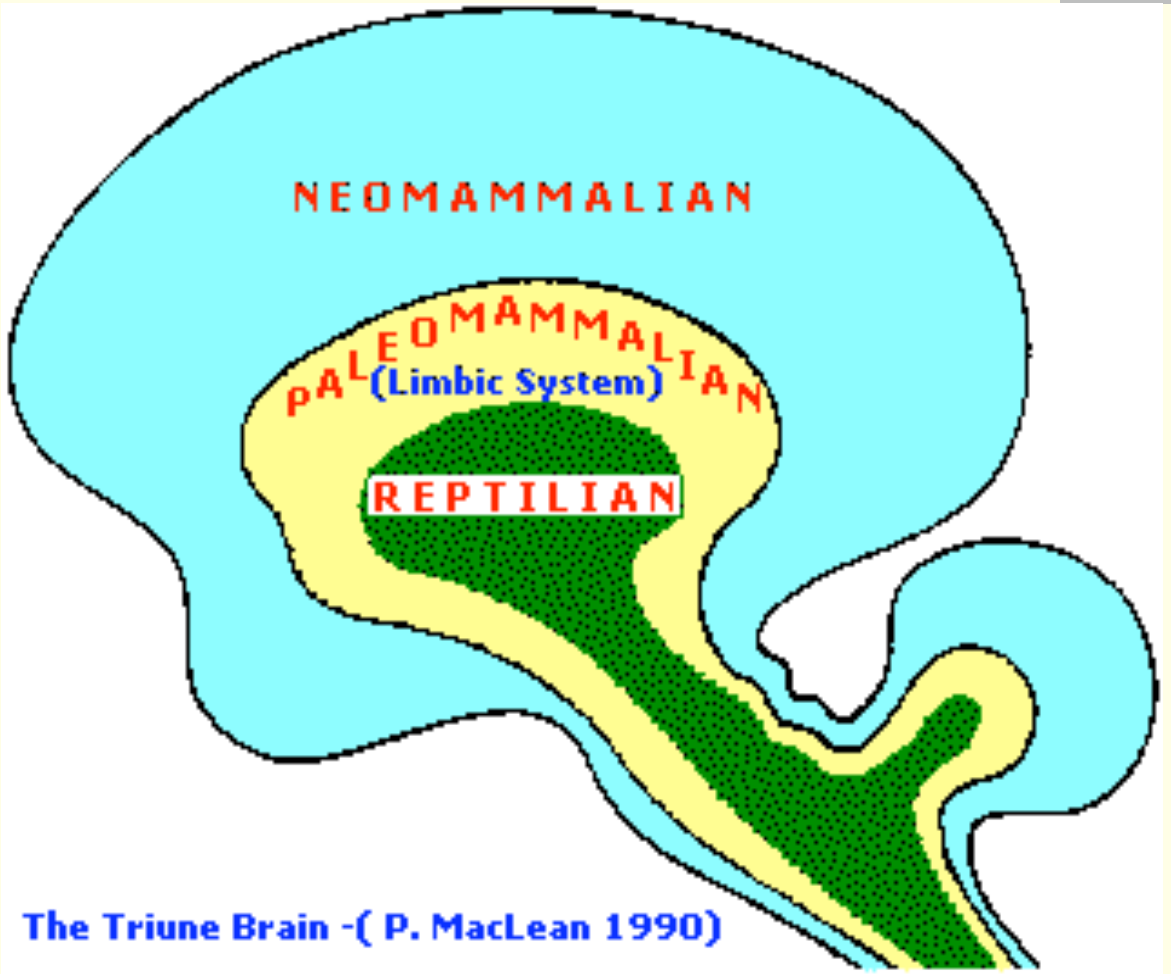
“Anthem”

Ring the bells that still can ring
Forget your perfect offering
There is a crack in everything
That’s how the light gets in
That’s how the light gets in

Leonard Cohen

The Naturally Resilient Brain

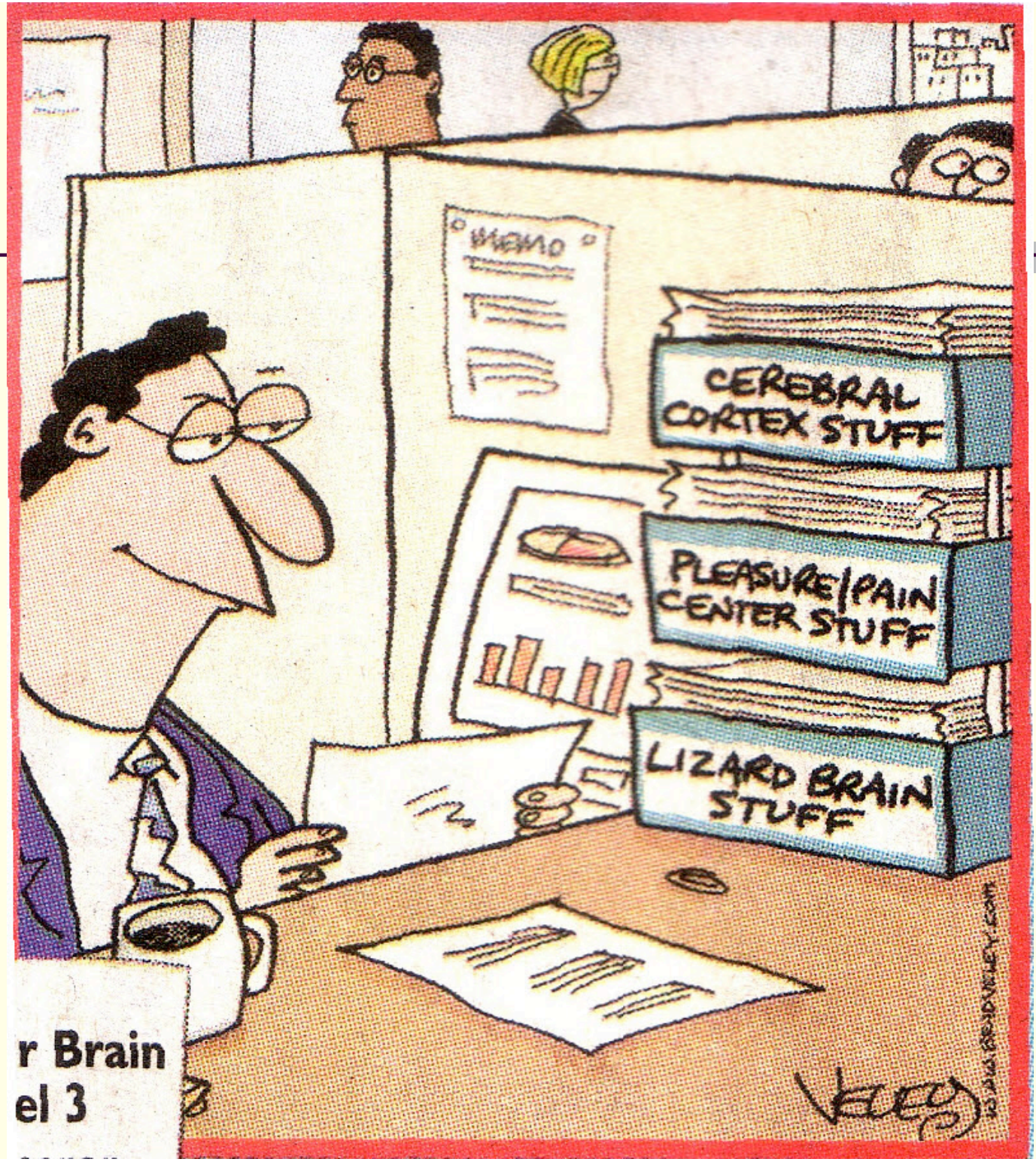
Evolutionary History



The Triune Brain

Three Stages of Brain Evolution

- **Reptilian:**
  - Brainstem, cerebellum, hypothalamus
  - Reactive and reflexive
  - **Avoid** hazards
- **Mammalian:**
  - Limbic system, cingulate, early cortex
  - Memory, emotion, social behavior
  - **Approach** rewards
- **Human:**
  - Massive cerebral cortex
  - Abstract thought, language, cooperative planning, empathy
  - **Attach** to “us”


MEMO
CEREBRAL CORTEX STUFF
PLEASURE/PAIN CENTER STUFF
LIZARD BRAIN STUFF
r Brain
el 3

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

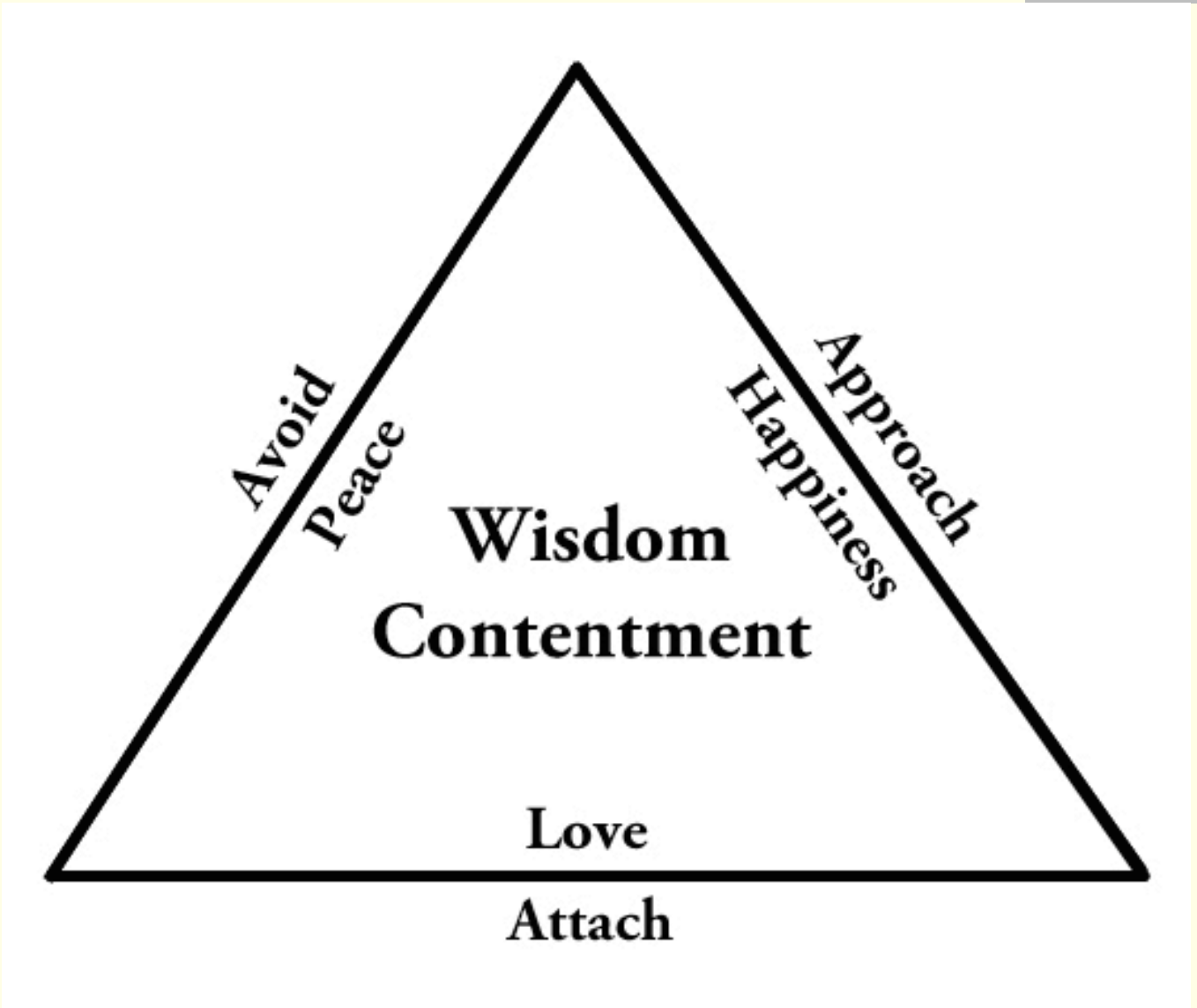
Home Base of the Human Brain

When not threatened, ill, in pain, hungry, upset, or chemically disturbed, most people settle into being:

- **Peaceful** (the Avoid system)
- **Happy** (the Approach system)
- **Loving** (the Attach system)

This is the brain in its natural, ***Responsive*** mode.

The Responsive Mode



Responsive Mode

	View	Action	Experience
Avoid	Resources, challenges-in-context	Govern/restrain, truth-to-power, forgive	Strength, safety, peace
Approach	Sufficiency, abundance, disenchantment	Aspire, give, let go	Glad, grateful, fulfilled, satisfied
Attach	Connection, belonging, social supplies	Open to others; join; be empathic, compassionate, kind, caring; love	Membership, closeness, friend-ship, bonding loved and loving

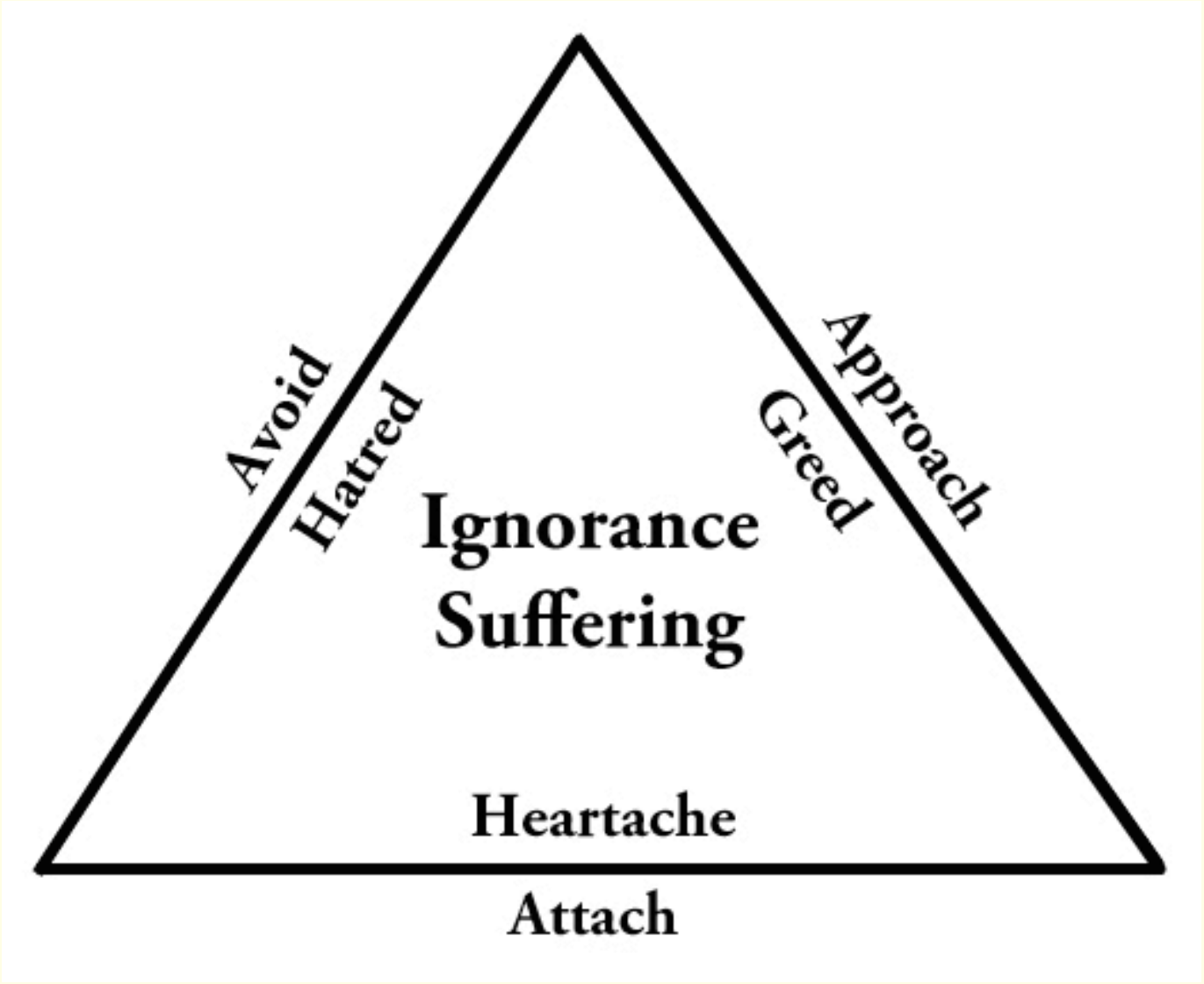
But to Cope with Urgent Needs, We Leave Home . . .

- **Avoid**: When we feel threatened or harmed
- **Approach**: When we can't attain important goals
- **Attach**: When we feel isolated, disconnected, unseen, unappreciated, unloved

This is the brain in its ***Reactive*** mode of functioning

- a kind of inner homelessness.

The Reactive Mode



Reactive Mode

	View	Action	Experience
Avoid	Harms present or lurking	Fight, flight, freeze	Fear, anger, weakness
Approach	Scarcity, loss, unreliability, not expected rewards	Grasp, acquire	Greed, longing, frustration, disappointment
Attach	Separated, being “beta,” devalued	Cling, seek approval, reproach	Loneliness, heart-break, envy, jealousy, shame

Psychopathology as Reactive Dysfunctions

- **Avoid** - Anxiety disorders; PTSD; panic, terror; rage; violence
- **Approach** - Addiction; over-drinking, -eating, -gambling; compulsion; hoarding; driving for goals at great cost; spiritual materialism
- **Attach** - Borderline, narcissistic, antisocial PD; symbiosis; *folie a deux*; “looking for love in all the wrong places”

Negativity Bias: Causes in Evolution

- "Sticks" - Predators, natural hazards, social aggression, pain (physical and psychological)
- "Carrots" - Food, sex, shelter, social support, pleasure (physical and psychological)
- During evolution, avoiding "sticks" usually had more effects on survival than approaching "carrots."
  - Urgency - Usually, sticks must be dealt with immediately, while carrots allow a longer approach.
  - Impact - Sticks usually determine mortality, carrots not; if you fail to get a carrot today, you'll likely have a chance at a carrot tomorrow; but if you fail to avoid a stick today - whap! - no more carrots forever.

A Major Result of the Negativity Bias: Threat Reactivity

- Two mistakes:
  - Thinking there is a tiger in the bushes when there isn't one.
  - Thinking there is no tiger in the bushes when there is one.
- We evolved to make the first mistake a hundred times to avoid making the second mistake even once.
- This evolutionary tendency is intensified by temperament, personal history, culture, and politics.
- Threat reactivity affects individuals, couples, families, organizations, nations, and the world as a whole.

A Poignant Truth

Mother Nature is tilted toward producing gene copies.

But tilted against personal quality of life.

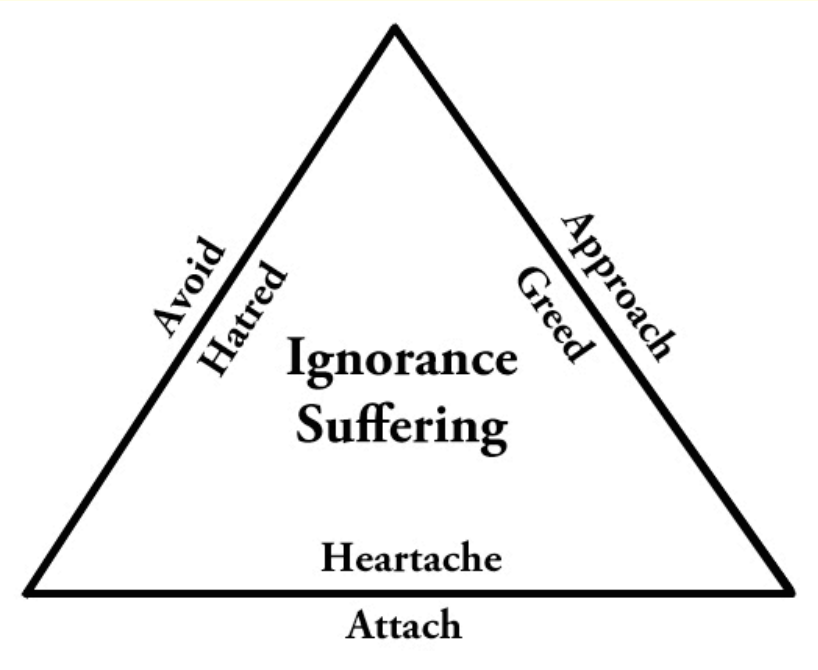
And at the societal level, we have caveman/cavewoman brains armed with nuclear weapons.

What shall we do?

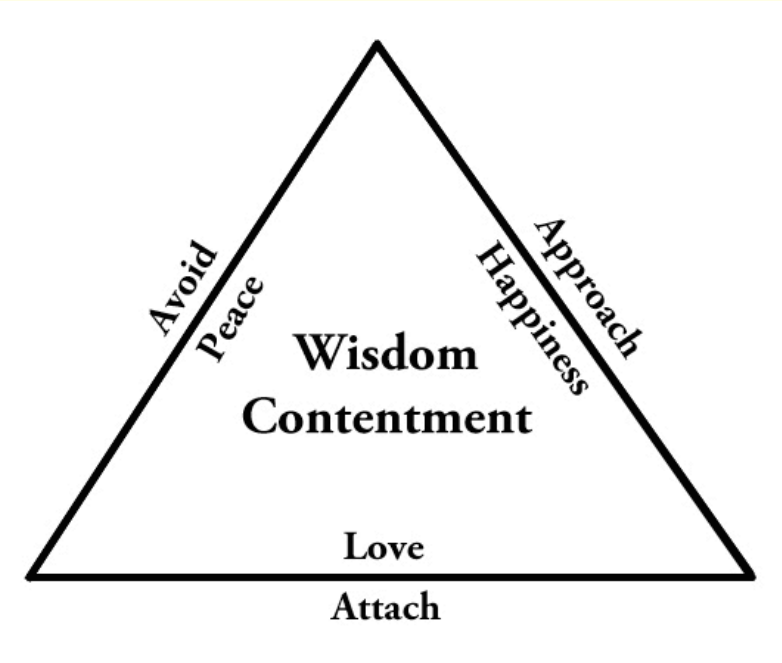
We can deliberately use the mind

to change the brain for the better.

Choices . . .



Or?



Reactive Mode

Responsive Mode

True Nature

Peaceful

Happy

Loving

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

Lao Tsu

Great Books

See 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

See 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

- 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

- 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

- 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.

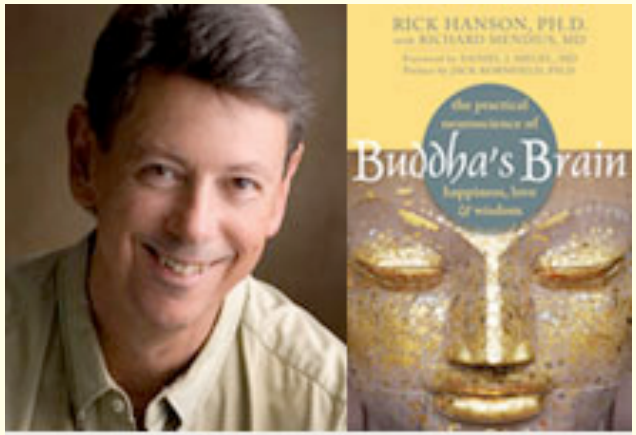
- Thompson, E. & Varela F.J. 2001. Radical embodiment: Neural dynamics and consciousness. *Trends in Cognitive Sciences,* 5:418-425.

- 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

http://www.youtube.com/BuddhasBrain

http://www.facebook.com/BuddhasBrain



Buddha's Brain: The Practical Neuroscience of Happiness, Love and Wisdom
Available at Amazon

www.RickHanson.net
www.WiseBrain.org