

The Buddha's Words on Lovingkindness

Wishing: In gladness and in safety, may all beings be at ease.

Omitting none, whether they are weak or strong, the great or the mighty, medium, short, or small, the seen and the unseen, those living near and far away, those born and to-be-born: May all beings be at ease.

Let none through anger or ill-will wish harm upon another. Even as a mother protects with her life her child, her only child, so with a boundless heart should one cherish all living beings; radiating kindness over the entire world: spreading upwards to the skies, and downwards to the depths, outwards and unbounded, freed from hatred and ill-will.

One should sustain this recollection.

This is said to be the sublime abiding.

The Loving Brain

True North Insight

August 21, 2010

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www.WiseBrain.org

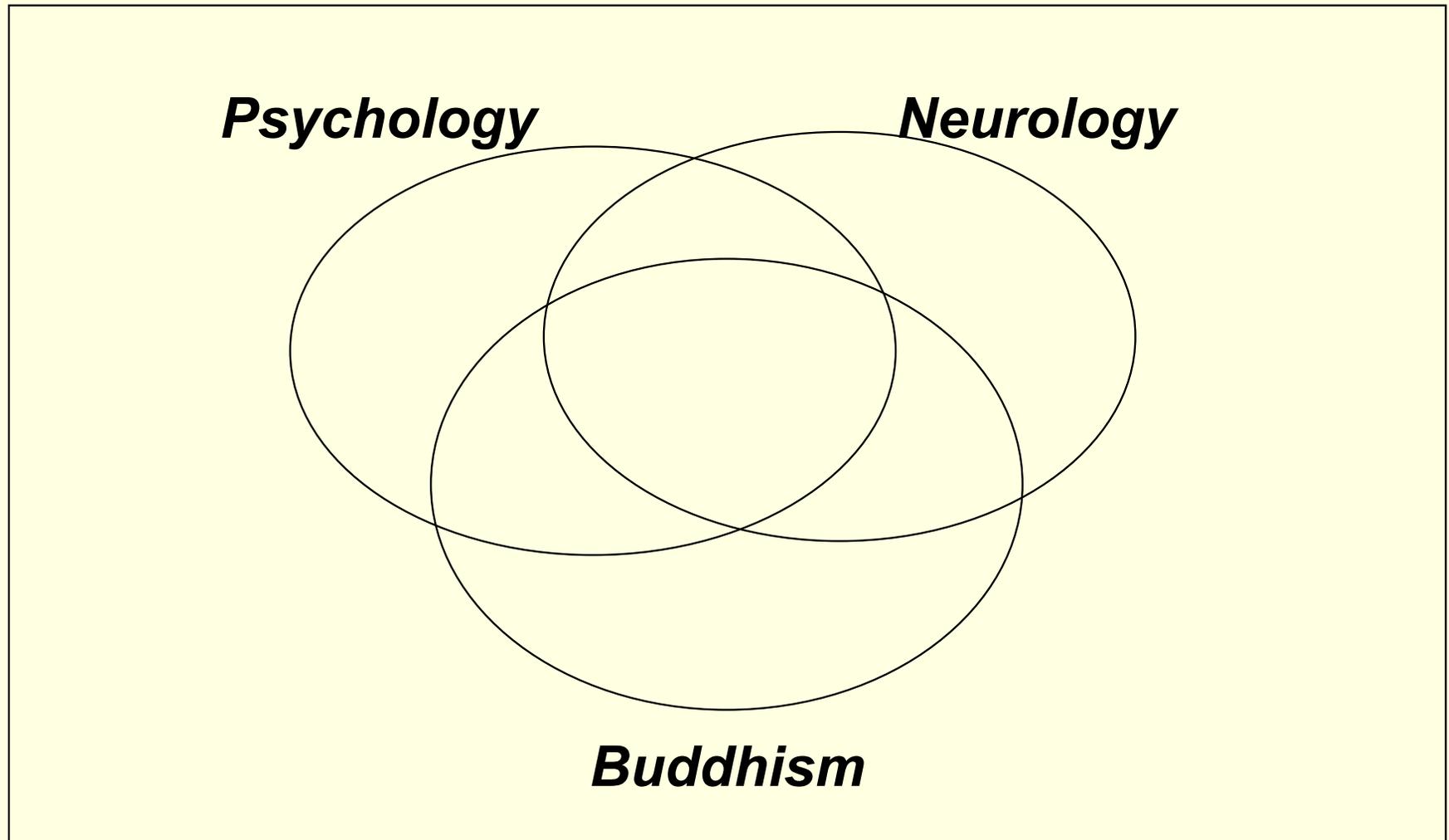
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Topics

- Self-Directed Neuroplasticity
- Foundations of Relationships
 - Self-Compassion
 - Being for Yourself
 - Unilateral Virtue
 - Healthy Assertiveness
- The Wolves of Love and Hate
- Empathy, Compassion, Lovingkindness

Common - and Fertile - Ground



We ask, "What is a thought?"

We don't know,

yet we are thinking continually.

Venerable Tenzin Palmo

Domains of Intervention

- We can intervene in three domains:
 - World (including relationships)
 - Body
 - Mind
- All three are important. And they work together.
- We have limited influence over world and body.
- In the mind:
 - Much more influence
 - Changes are with us wherever we go

“Know the Mind, Shape the Mind, Free the Mind”

- **Mindfulness, virtue, and wisdom** are identified in Buddhism, other contemplative traditions, and Western psychology as central pillars of practice.
- These map to central functions of the nervous system: receiving/learning, regulating, and prioritizing. And map to the three phases of psychological healing and personal growth:
 - Be mindful of, release, replace.
 - Let be, let go, let in.
- Mindfulness is vital, but not enough by itself.



**Why does the brain matter,
on the path of awakening?**



The Mind/Brain System

- “Mind” = flow of information within the nervous system
 - Information is represented by the nervous system.
 - Most mind is unconscious; awareness is part of mind.
 - The headquarters of the nervous system is the brain.
- In essence then, apart from hypothetical transcendental factors, your mind *is* what your brain *does*.
- Brain = necessary, *proximally* sufficient condition for mind.
 - The brain depends on the nervous system, which intertwines with and depends on other bodily systems.
 - These systems in turn intertwine with and depend upon nature and culture, both presently and over time.
 - And as we’ll see, the brain also depends on the mind.

Your Amazing Brain

■ **Size:**

- 3 pounds of tofu-like tissue
- 1.1 trillion brain cells
- 100 billion “gray matter” neurons

■ **Activity:**

- Always on 24/7/365 - Instant access to information on demand
- 20-25% of blood flow, oxygen, and glucose

■ **Speed:**

- Neurons firing around 5 to 50 times a second (or faster)
- Signals crossing your brain in a tenth or hundredth of a second

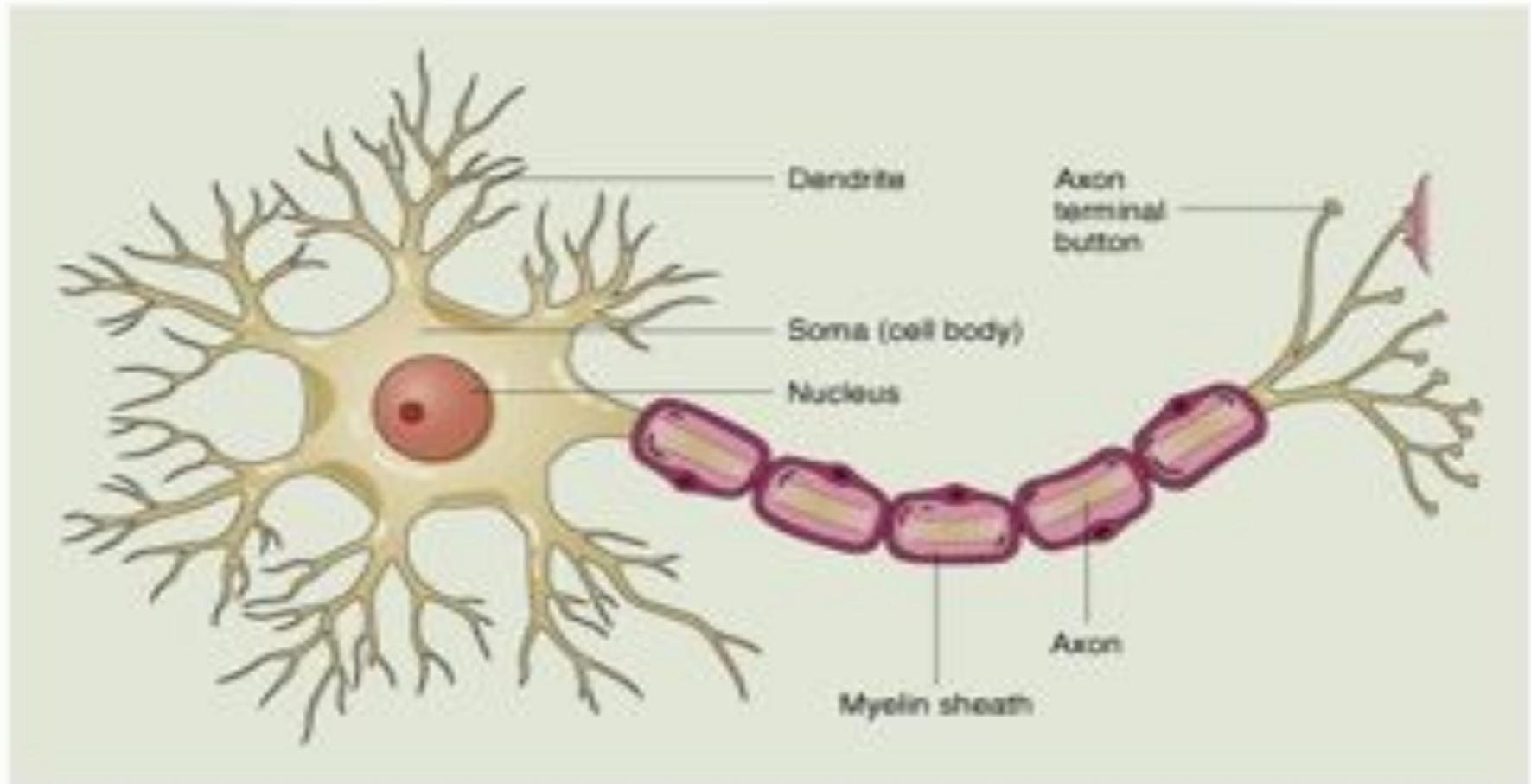
■ **Connectivity:**

- Typical neuron makes ~5000 connections with other neurons:
~ 500 trillion synapses
- During one breath, a quadrillion-plus signals coursed through your head.

■ **Complexity:**

- Potentially 10 to the millionth power brain states

A Neuron



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Fact #1

As your brain changes, your mind changes.



Fact #2

As your mind changes, your brain changes.

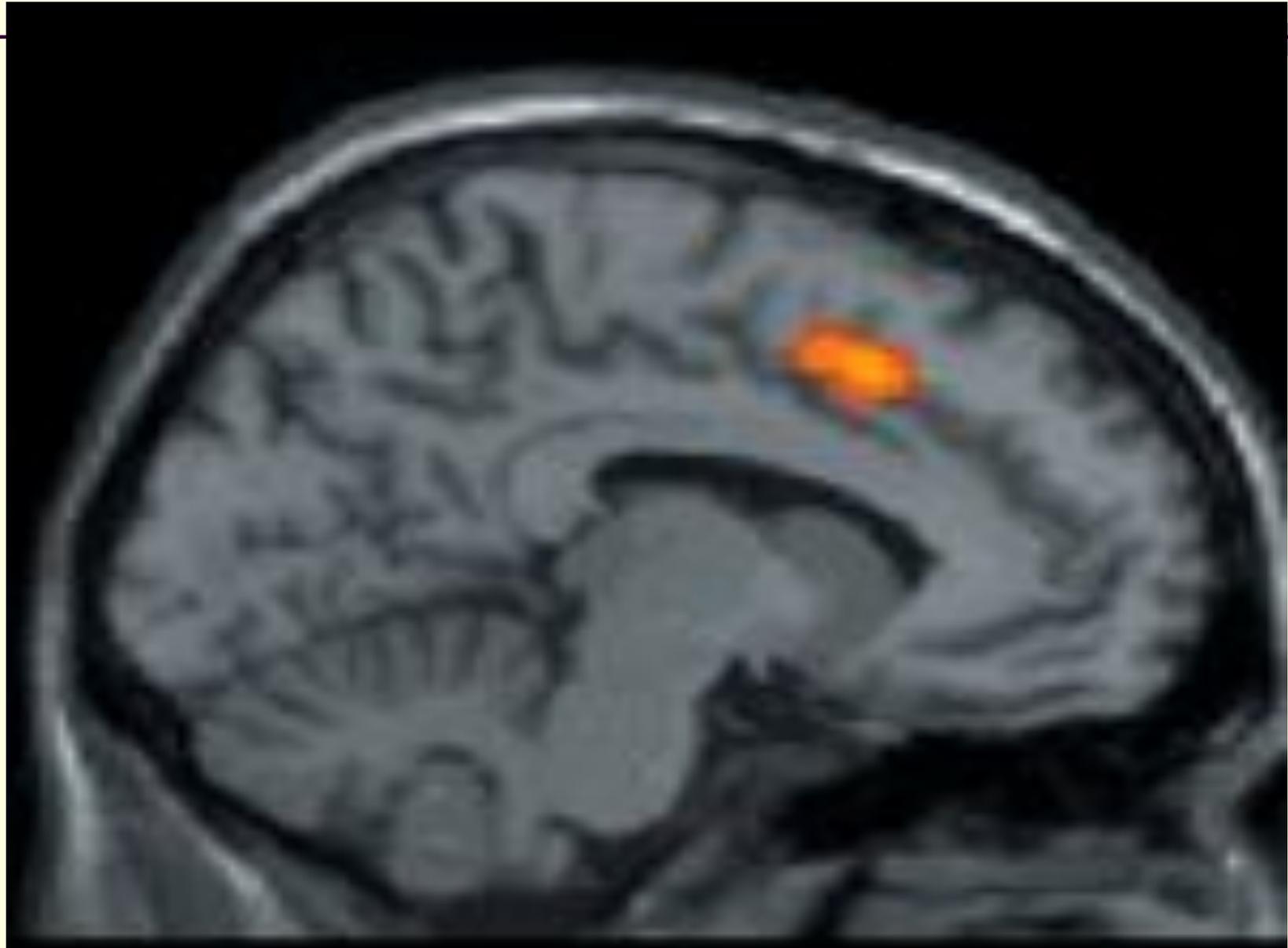
Immaterial mental activity maps to material neural activity.

This produces temporary changes in your brain and lasting ones.

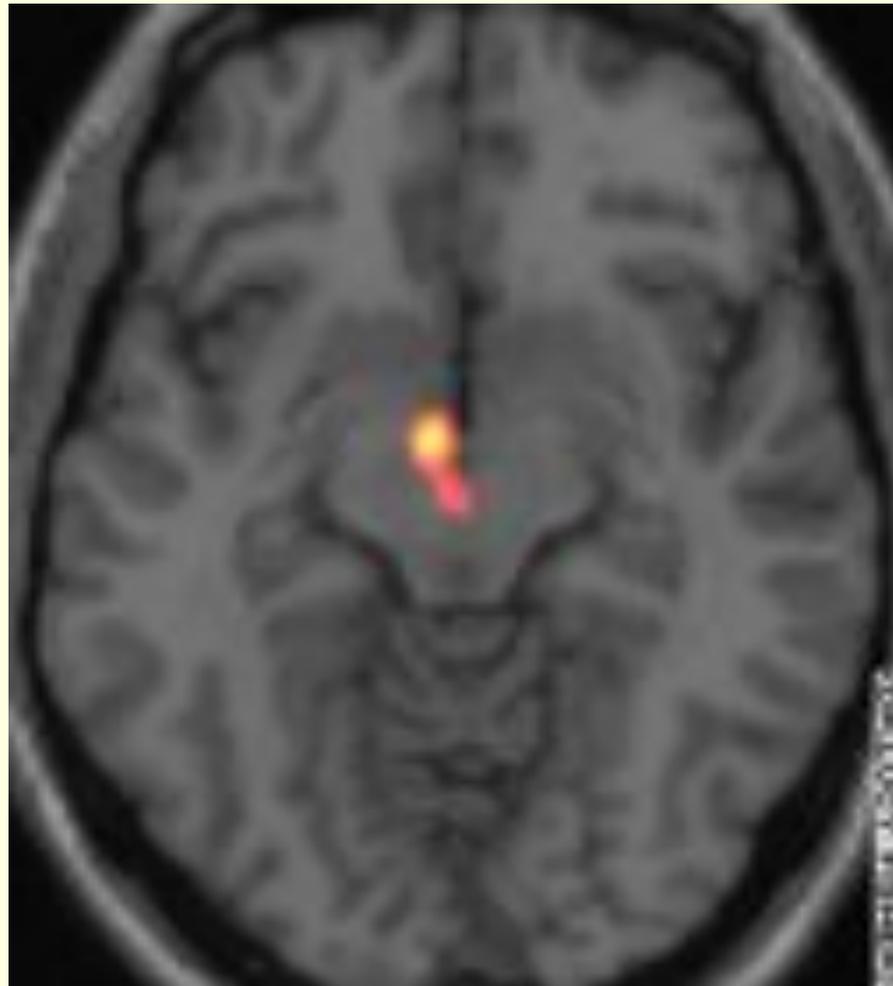
Temporary changes include:

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

Tibetan Monk, Boundless Compassion

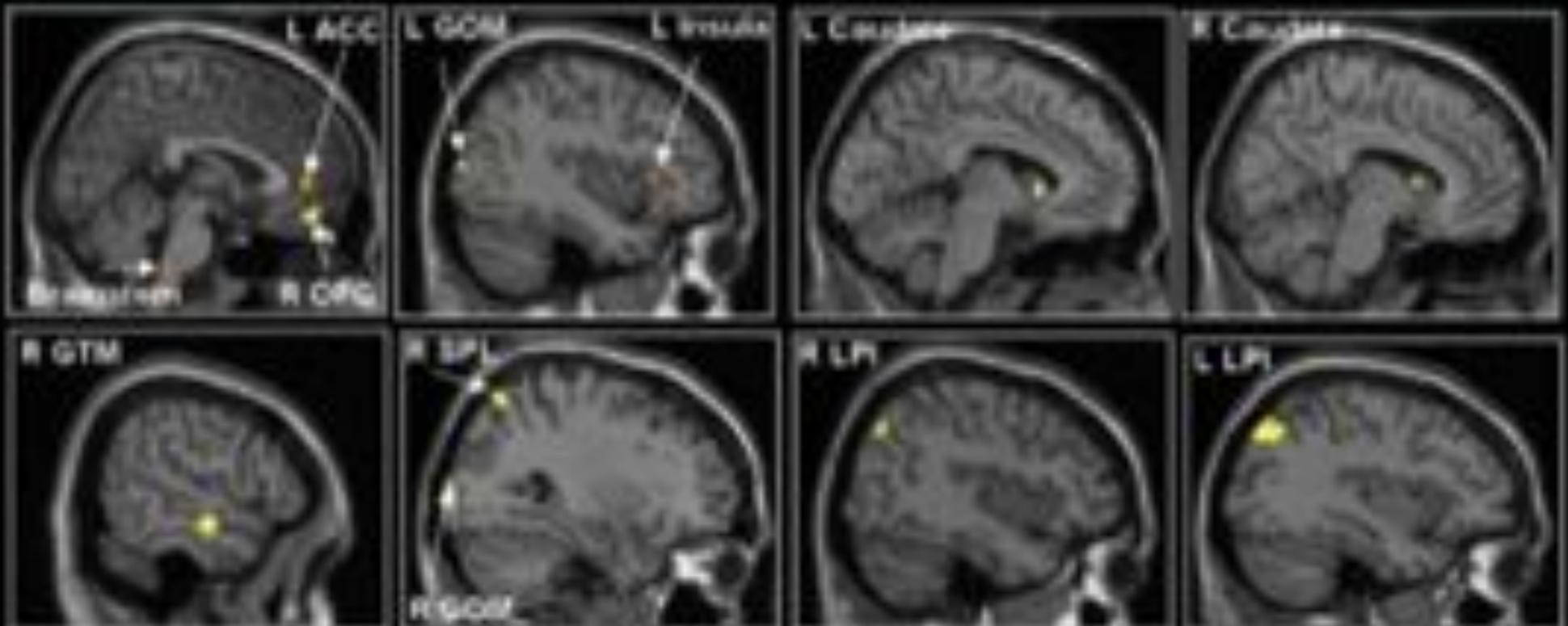


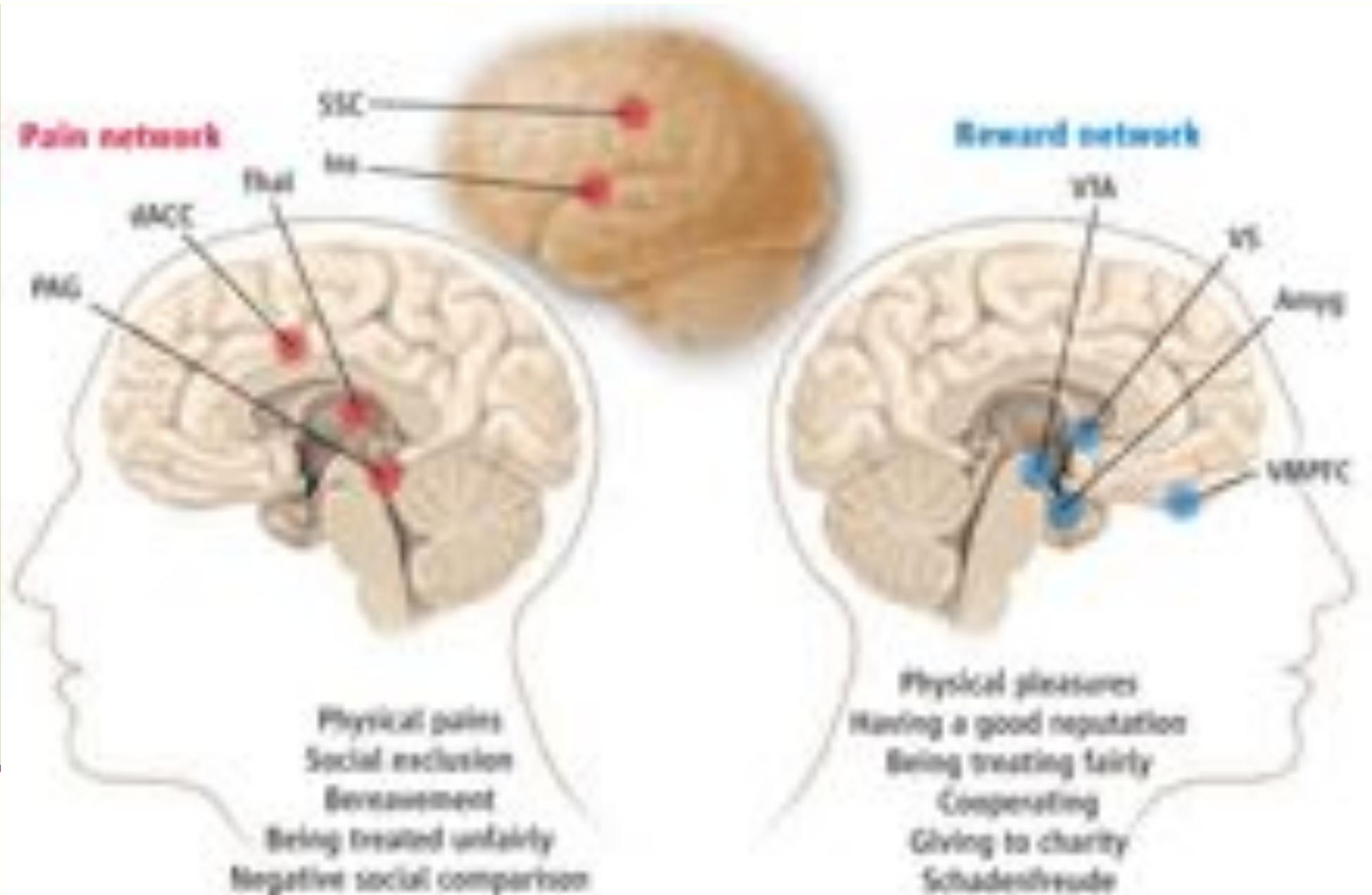
Rewards of Love



Christian Nuns, Recalling Profound Spiritual Experiences

Mystical > Baseline





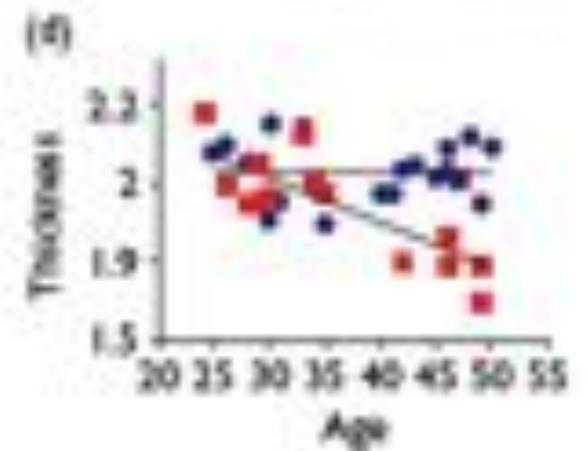
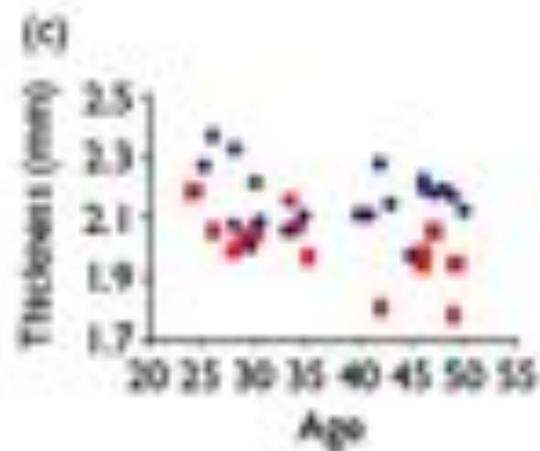
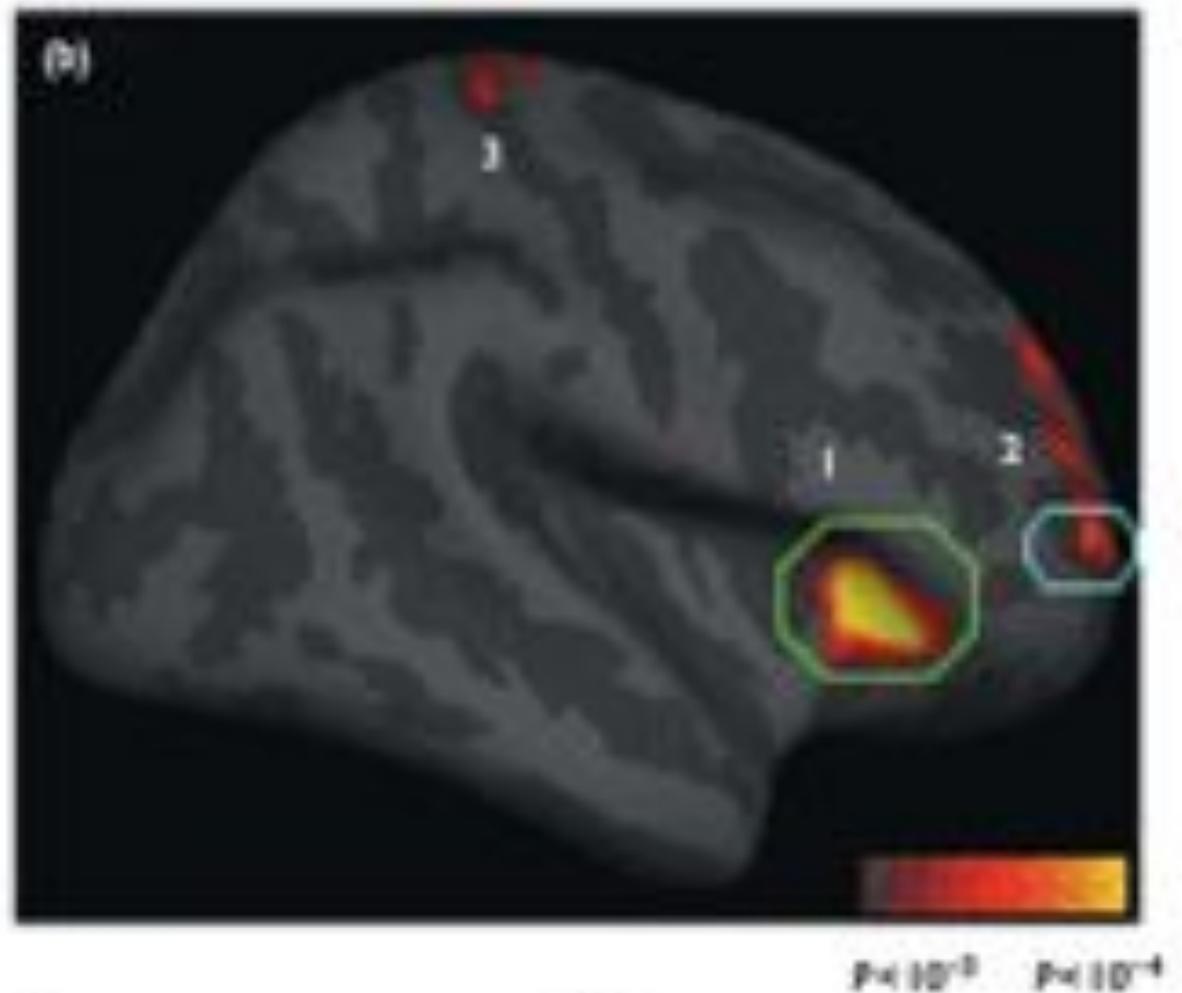
Pain network: Dorsal anterior cingulate cortex (dACC), insula (Ins), somatosensory cortex (SSC), thalamus (Thal), and periaqueductal gray (PAG).

Reward network: Ventral tegmental area (VTA), ventral striatum (VS), ventromedial prefrontal cortex (VMPFC), and amygdala (Amyg).

Mental Activity Shapes Neural Structure

- The flows of mind sculpt the brain.
- Immaterial information 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.





*The principal activities of brains
are making changes in themselves.*



Marvin L. Minsky

Fact #3

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

This is self-directed neuroplasticity.

Perspectives on Neuroplasticity

- Neuroplasticity is not breaking news: For a century or more, it's been presumed that mental activity changed neural structure: what else is learning? (The news is in the details of how.)
- Most neuroplasticity is incremental; occasionally it's dramatic.
- Awareness increases neural structure-building. Residues of conscious experience continually sift into implicit memory.
- Your experience *matters*. Both for how it feels now and for the lasting threads it weaves into the fabric of your brain and being.
- Most experience is background, in the “simulator.” Thus the importance of mindfulness.

The Power of Mindfulness

- Attention is like a spotlight, illuminating what it rests upon.
- Because neuroplasticity is heightened for what's in the field of focused awareness, attention is also like a vacuum cleaner, sucking its contents into the brain.
- Directing attention skillfully through mindfulness is therefore a fundamental way to shape the brain - and one's life over time.

*The education of attention
would be an education par excellence.*

William James

*The root of Buddhism is compassion,
and the root of compassion is compassion for oneself.*

Pema Chodren

Self-Compassion

- Compassion is the wish that someone not suffer, combined with feelings of sympathetic concern. Self-compassion simply applies that to oneself. It is not self-pity, complaining, or wallowing in pain.
- Self-compassion is a major area of research, with studies showing that it buffers stress and increases resilience and self-worth.
- But self-compassion is hard for many people, due to feelings of unworthiness, self-criticism, or “internalized oppression.” To encourage the neural substrates of self-compassion:
 - Get the sense of being cared about by someone else.
 - Bring to mind someone you naturally feel compassion for
 - Sink into the experience of compassion in your body
- Then shift the focus of compassion to yourself, perhaps with phrases like: “May I not suffer. May the pain of this moment pass.”

Being for Yourself

- All the great teachers have told us to be compassionate and kind toward all beings. And that whatever we do to the world affects us, and whatever we do to ourselves affects the world.
- You are one of the “all beings!” And kindness to yourself benefits the world, while hurting yourself harms the world.
- It’s a general moral principle that the more power you have over someone, the greater your duty is to use that power wisely. Well, who is the one person in the world you have the greatest power over? It’s your future self. You hold that life in your hands, and what it will be depends on how you care for it.
- Consider yourself as an innocent child, as deserving of care and happiness as any other.

How Virtue Supports Relationships

- Brings peace of mind, “the bliss of blamelessness”
- Reduces interpersonal wrangles
- Encourages good behavior in others
- Teaches us what we can ask for from others

Buddhist Relationship Virtues

- These are aids to practice, not rules that are a sin to break.
- The Five Precepts: Do not kill, steal, create harms through sexuality, lie, or abuse intoxicants.
- Wise Livelihood: Do not trade in weapons, living beings, meat, intoxicants, or poisons.
- Wise Speech: Say only what is well-intended, true, beneficial, timely, expressed without harshness, and - ideally - wanted.
- The fundamental principle of non-harming . . . including oneself

Benefits of Unilateral Virtue

- Simplifies things: all you have to do is just live by your own code, and others will do whatever they do.
- Feels good in its own right.
- Minimizes inflammatory triggers, evokes good treatment, empowers you to ask for it.
- Stands you on the moral high ground.

Remaining virtuous in the face of provocation is a profound expression of non-harming and benevolence toward all beings.

Wisdom is . . . all about understanding the underlying spacious and empty quality of the person and of all experienced phenomena.

To attain this quality of deep insight, we must have a mind that is quiet and malleable.

Achieving such a state of mind requires that we first develop the ability to regulate our body and speech so as to cause no conflict.

Venerable Ani Tenzin Palmo

Feeling Strong

- Feeling the strength in awareness itself, never sullied or rattled by what passes through it
- Sense the vitality in your body.
- Recall a time you felt really strong.
- Energy and strength in your breathing . . . in arms and legs . . . in your whole being . . .
- A spacious strength that lets others flow through
- In relationship and at peace
- Relaxed in a spacious world; no need for struggle

Lunchtime Reflections . . .

*Outstanding behavior,
blameless action,
open hands to all,
and selfless giving:*

This is a blessing supreme.

The Buddha

Evolution

- ~ 4+ billion years of earth
- 3.5 billion years of life
- 650 million years of multi-celled organisms
- 600 million years of nervous system
- ~ 80 million years of mammals
- ~ 60 million years of primates
- ~ 6 million years ago: last common ancestor with chimpanzees, our closest relative among the “great apes” (gorillas, orangutans, chimpanzees, bonobos, humans)
- 2.5 million years of tool-making (starting with brains 1/3 our size)
- ~ 150,000 years of *homo sapiens*
- ~ 50,000 years of modern humans
- ~ 5000 years of blue eyes

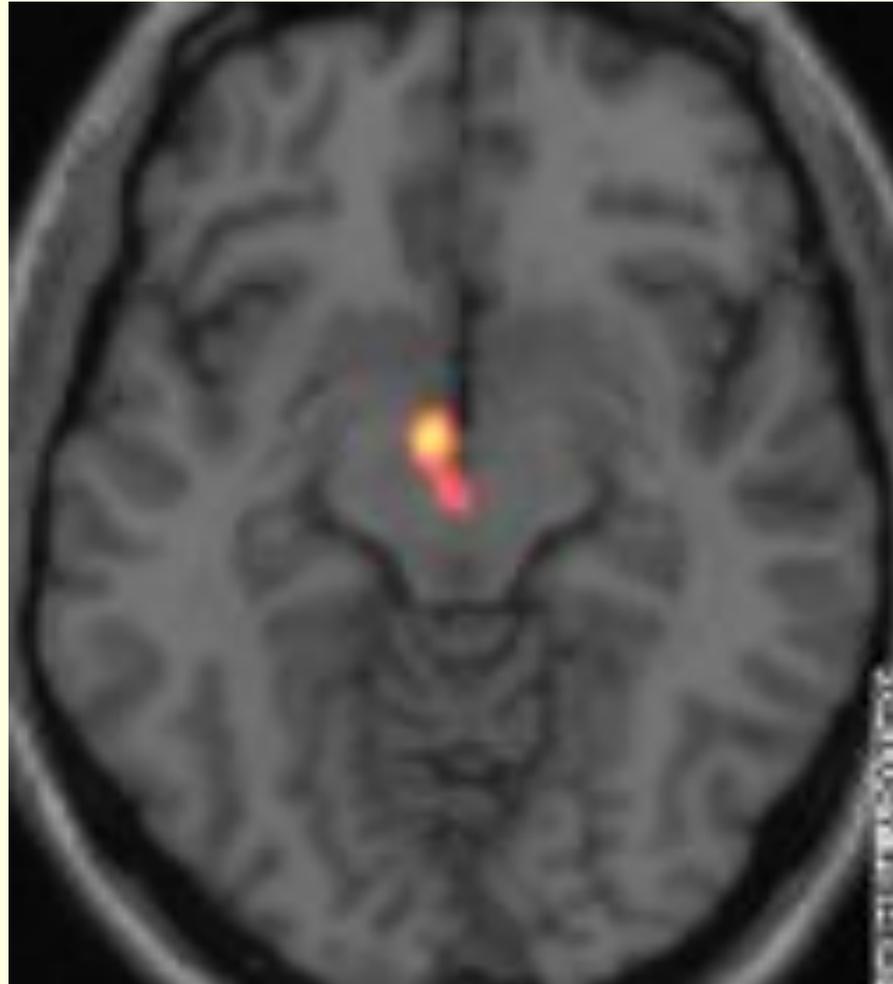
Evolution of Bonding, Cooperation, and Love

- Mammals and birds have bigger brains than reptiles and fish because they raise their young and often pair-bond.
 - Monogamous species have larger brains.
- More social primate species have bigger brains.
- Human hunter-gatherer bands competed intensely with other bands; the ones with the best teamwork usually won.
 - Genetically, it makes sense to altruistically sacrifice your own life if that promotes the survival of others with whom you share genes.

The Brain in Lust and Love

- When we see someone we are infatuated with or love, the tegmentum on top of the brainstem sends dopamine to the caudate nucleus (basal ganglia); caudate signals: “Send more!”
- Being rejected in love activates the insula, also involved in the experience of physical pain.
- Lust activates hypothalamus and amygdala: drives, emotion, and arousal
- Over time, the intensity of rewards settles down; they can remain powerful even if more diffuse.

The Rewards of Love



Oxytocin

- Promotes bonding between mothers and children, and between mates, keeping those kids alive
- In women, triggers let-down reflex in nursing, and tend-and-befriend behaviors during stress
- In both women and men, it dampens the stress response, and it feels pleasurable, relaxed, a “rightness.”
- Rewards all bonding behaviors
- Triggered by:
 - Nipple stimulation
 - Orgasm
 - Physical contact (especially skin to skin)
 - Moving together harmoniously (dancing)
 - Warm feelings of rapport or love (lovingkindness); devotion
 - Imagination of these

Ananda approached the Buddha and said, "Venerable sir, this is half of the spiritual life: good friendship, good companionship, good comradeship."

*"Not so, Ananda! Not so Ananda!" the Buddha replied.
"This is the entire spiritual life. When you have a good friend, a good companion, a good comrade, it is to be expected that you will develop and cultivate the Noble Eightfold Path."*

[adapted from *In the Buddha's Words*, Bhikkhu Bodhi]

Us and Them

- Core evolutionary strategy: within-group cooperation, and between-group aggression.
- Both capacities and tendencies are hard-wired into our brains, ready for activation. And there is individual variation.
- Our biological nature is much more inclined toward cooperative sociability than toward aggression and indifference or cruelty. We are just very reactive to social distinctions and threats.
- That reactivity is intensified and often exploited by economic, cultural, and religious factors.
- Two wolves in your heart:
 - Love sees a vast circle in which all beings are “us.”
 - Hate sees a small circle of “us,” even only the self.

Which one will you feed?

In between-family fights, the baboon's 'I' expands to include all of her close kin; in within-family fights, it contracts to include only herself.

This explanation serves for baboons as much as for the Montagues and Capulets.

Baboon Metaphysics: The Evolution of a Social Mind,
by Dorothy Cheney and Robert Seyfarth

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What Is Empathy?

- Sensing, feeling, and understanding how it is for the other person
- Both a bodily resonance and a conceptual understanding
- Empathy is usually communicated, though often tacitly.
- We can give empathy, we can receive it, and we can ask for it.

Empathy in Buddhist Practice

- Empathy expresses Wise View, which sees how we are all related to each other.
 - Empathy is thus, in a deep sense, self-understanding
- Empathy is sila in action, the restraint of reactive patterns to be present with others.
- Empathy involves non-attachment to view, dropping our “case,” entering into “don’t know mind.”
- Empathy embodies non-harming.
- Compassion is not enough; we need to feel the weight of the other person’s experience.

Neural Substrates of Empathy

- Three *simulating* systems:
 - Actions: “mirror” systems; temporal-parietal
 - Feelings: resonating emotionally; insula
 - Thoughts: “theory of mind”; prefrontal cortex
- These systems interact with each other through association and active inquiry.
- They produce an automatic, continual re-creation of aspects of others’ experience.

Empathy Skills

- Pay attention.
- Be open.
- Read emotion in face and eyes.
- Sense beneath the surface.
- Drop aversion (judgments, distaste, fear, anger, withdrawal).
- Investigate actively.
- Express empathic understanding:
 - Reflect the content
 - Resonate with the tone and implicit material
 - Questions are fine
 - Offer respect and wise speech throughout

Reflections about Empathy

- You're more likely to get empathy if you're:
 - Open, present
 - Honest, real, authentic
 - Reasonably clear
 - Responsible for your own experience
 - Taking it in when you feel felt

- Empathy can be negotiated:
 - Name it as a topic in the relationship
 - Follow NVC format: "When X happens, I feel Y, because I need Z. So I request _____."
 - Stay with it.

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Practicing with Rejection and Hurt

RAINBOW:

- **R**ecognize the experience
- **A**ccept that it is what it is
- **I**nvestigate it: textures and layers
- **N**ot-self it: observe it without identifying with it; see its compounded nature; see the vast stream of causes of it
- **B**reathe and let go; activate PNS; release “wrong views”
- **O**pen to new perspectives, feelings, and plans; find refuge
- **W**elcome that new wisdom into your being: take in the good so it becomes part of you

Feeding the Wolf of Love

- Focus on similarities between “us” and “them.”
- Consider others as young children.
- Notice good things about neutral or unpleasant people.
- Bring to mind the sense of someone who cares about you.
- Keep extending out the sense of “us” to include everyone.
- Consider others as your mother or dear friend in a past life.
- Sila/restraint about over-identifying with “us”
- Reflect on the suffering of so many people in the world.
- Self-generate feelings of kindness and love.

So that all cubs are our own . . .
So that all beings are our clan . . .
All life, our relatives . . .
The whole earth, our home . . .

*May you know love, joy, wonder, and wisdom,
in this life, just as it is.*

Thank you!

Great Books

See www.RickHanson.net for other great books.

- Austin, J. 2009. *Selfless Insight: Zen and the Meditative Transformations of Consciousness*. MIT Press.
- Begley, S. 2007. *Train Your Mind, Change Your Brain: How a New Science Reveals Our Extraordinary Potential to Transform Ourselves*. Ballantine.
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- Johnson, S. 2005. *Mind Wide Open: Your Brain and the Neuroscience of Everyday Life*. Scribner.
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- Sapolsky, R. 2004. *Why Zebras Don't Get Ulcers*. Holt.
- Siegel, D. 2007. *The Mindful Brain: Reflection and Attunement in the Cultivation of Well-Being*. W. W. Norton & Co.
- Thompson, E. 2007. *Mind in Life: Biology, Phenomenology, and the Sciences of Mind*. Belknap Press.

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.
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- 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.
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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.

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.
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Key Papers - 4

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