
*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.*

Hardwiring Happiness:

The New Brain Science of Lasting Inner Strength and Peace

Sounds True

Seattle, February 20-21, 2016

Rick Hanson, Ph.D.

The Wellspring Institute for Neuroscience and Contemplative Wisdom


WiseBrain.org RickHanson.net

Topics 1

- **It's good to be happy**
- **How to be happy**
- **Experiencing positive neuroplasticity**
- **What is happening in your brain**
- **Self-compassion**
- **Self-directed neuroplasticity**
- **Self-compassion**

Topics 2

- **The missing link**
- **The negativity bias**
- **Getting good at getting better**
- **It's good to take in the good**
- **Using HEAL with others**
- **Growing key strengths**
- **The Buddha's drive theory of suffering**
- **Larger implications of mindful cultivation**



**It's Good to Be Happy
(and strong, loving, and peaceful)**

What Is Happiness?

Hedonia

Eudaimonia

Benefits of Happiness

- **Feels good (duh)**
- **Better health**
- **Longer life**
- **Greater resilience**
- **More success**
- **Stronger relationships**
- **More cooperative, giving, and loving toward others**



How to Be Happy

What Shapes Your Course?

Challenges

Vulnerabilities

Resources

Where Are Resources Located?

World

Body

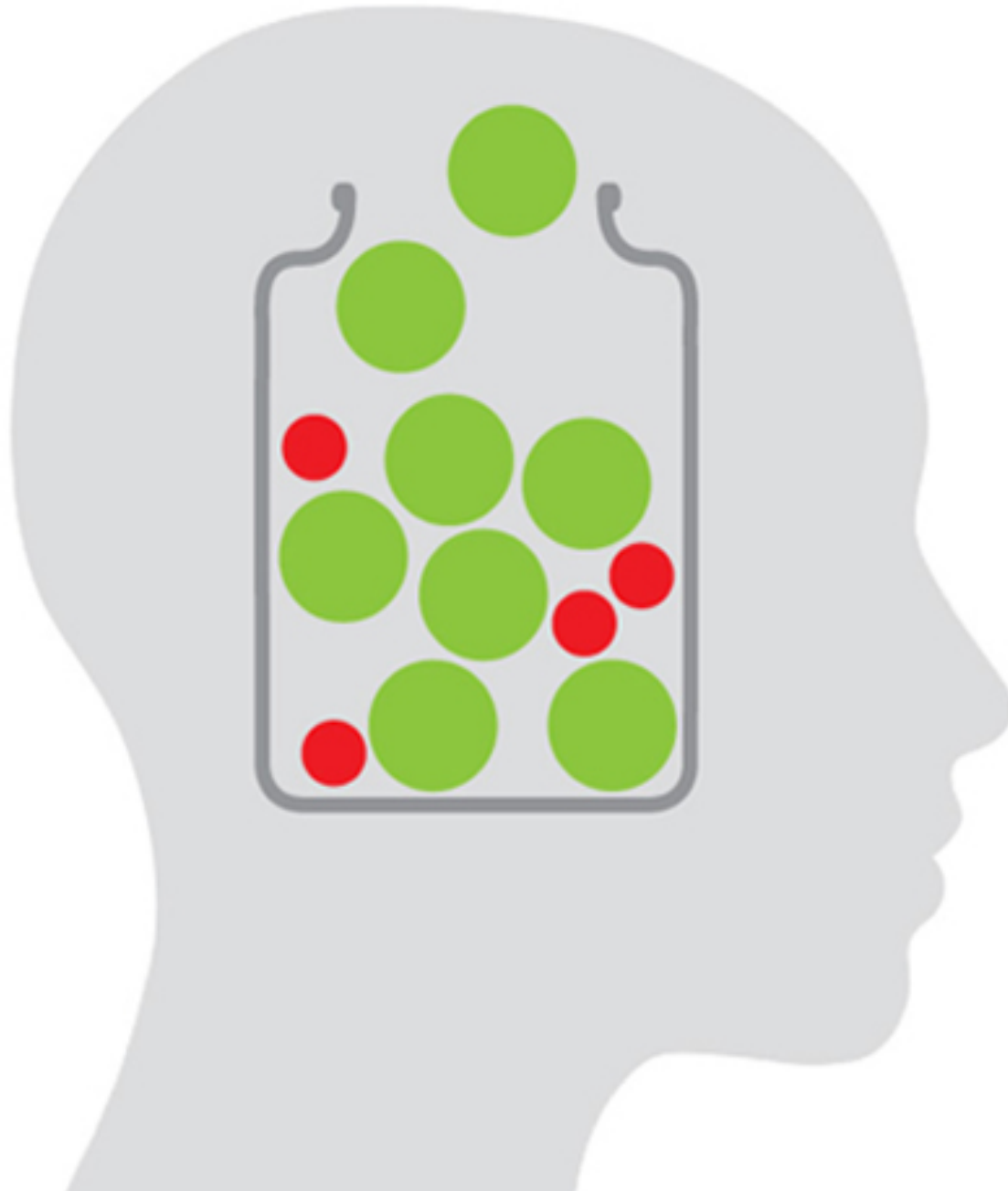
Mind


Resources in Your Mind

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

Two wolves in the heart

INNER STRENGTHS ARE BUILT FROM BRAIN STRUCTURE





**How do you
get these inner strengths
into your brain?**



Experiencing Positive Neuroplasticity

Pick a partner and choose an A and a B (A's go first). Then you'll take turns, with one partner mainly speaking while the other person listens, exploring this question:

Speaker: What are some of the good facts in your life these days?

Listener: Find a sincere gladness for the other person.

Both: Repeatedly take 5-10 seconds to feel and register enjoyable, beneficial experiences

What We're Doing

1. Learning **how** to deliberately internalize beneficial experiences in implicit memory
2. Using internalization skills to cultivate **what** would be beneficial in your mind
3. Exploring different **ways** to encourage beneficial states and traits


→ #1 is the most important here.



What Is Happening in Your Brain

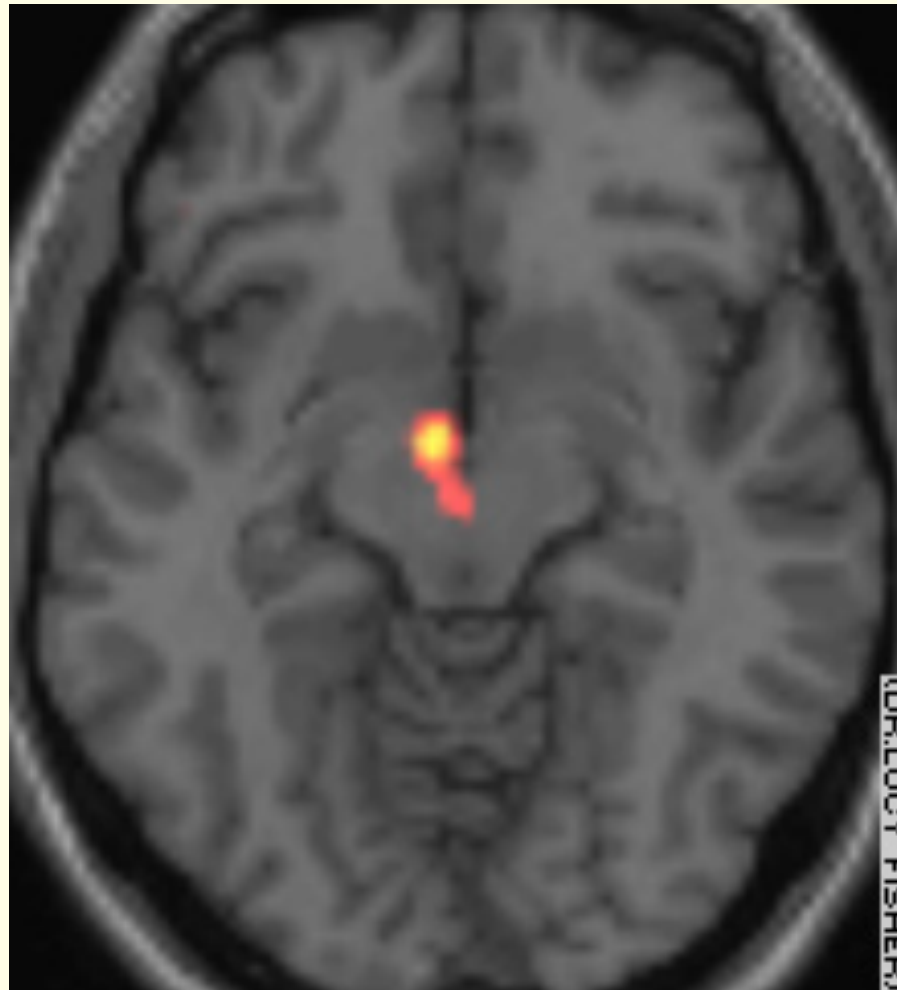
The Enchanted Loom



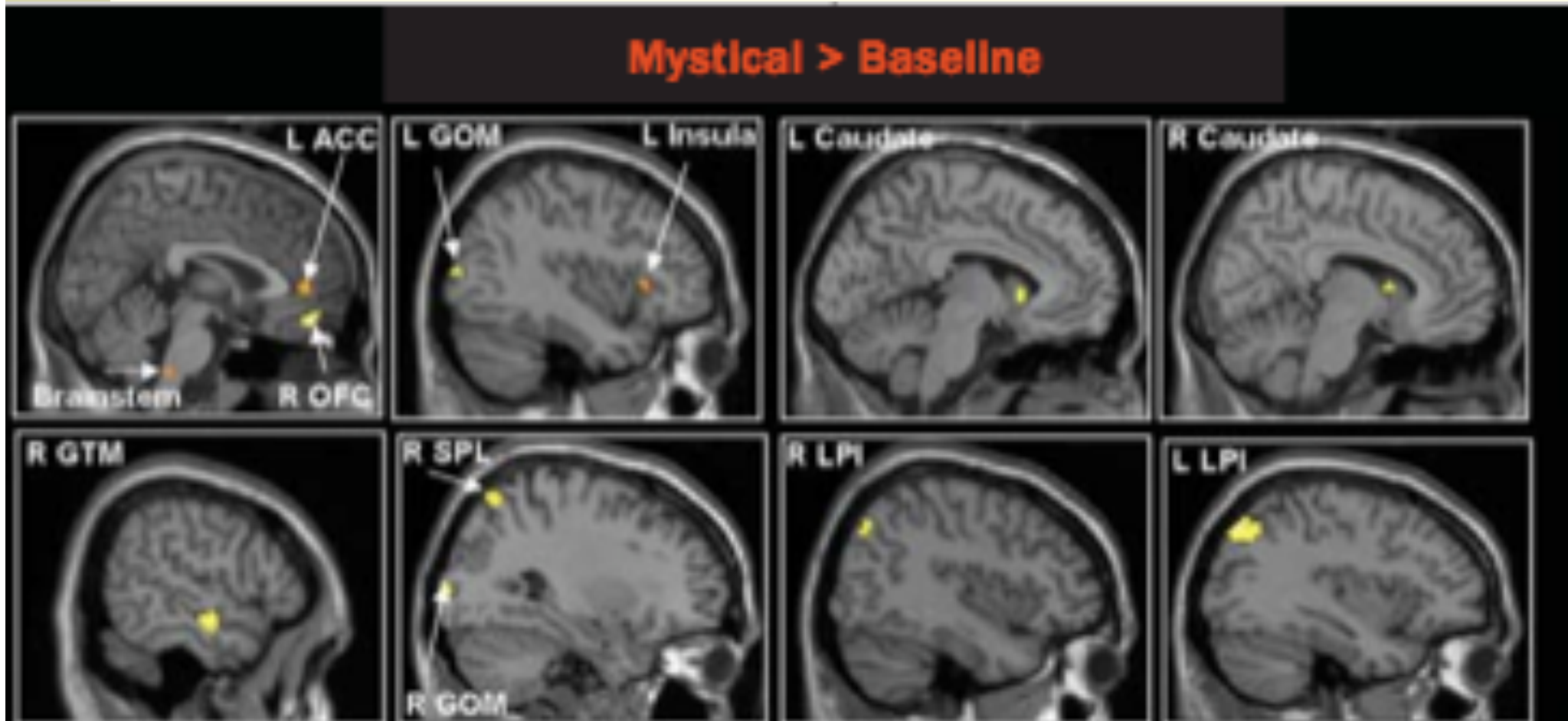


**Mental activity entails
underlying neural activity.**

Rewards of Love



Christian Nuns, Recalling a Profound Spiritual Experience



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

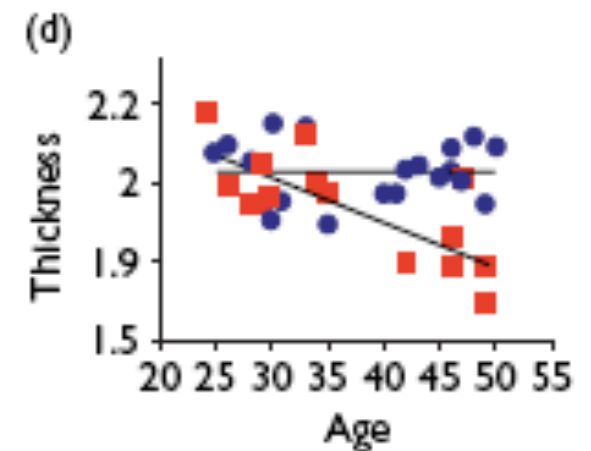
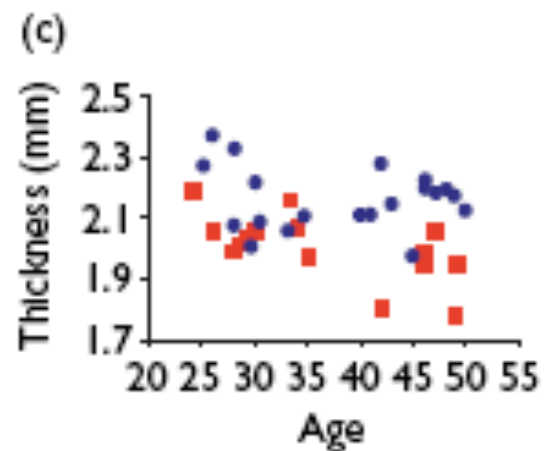
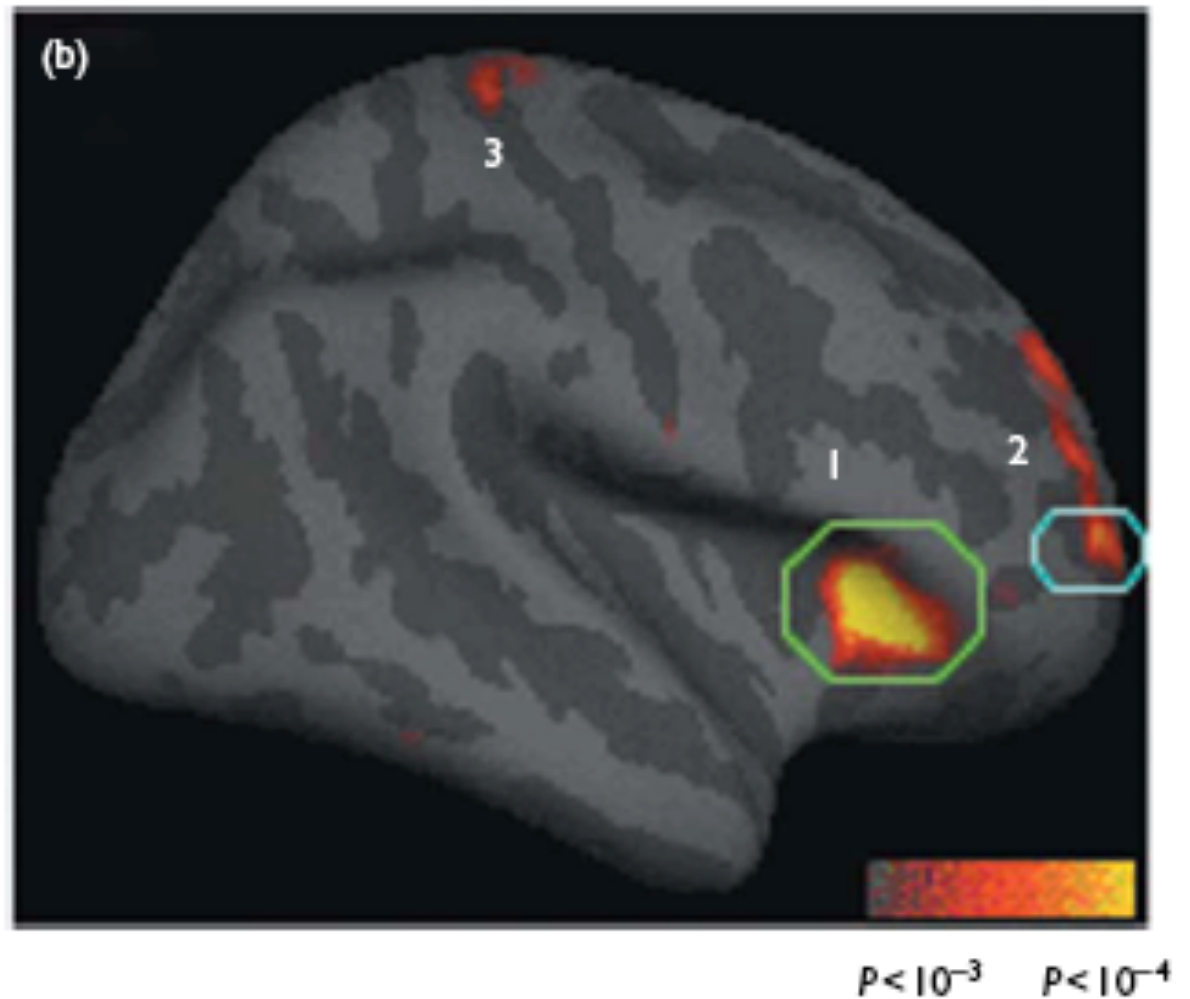
**Repeated neural activity
builds neural structure.**

A detailed illustration of a neural network. The background is a dense web of thin, glowing yellow lines representing axons. Several larger, more complex structures represent neuron cell bodies. One central neuron is highlighted with a bright green, translucent sphere in its center, making it stand out from the others. The overall color palette is dominated by warm yellows and oranges against a dark background.

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.



Self-Compassion

Self-Compassion

- Compassion is the wish that a being not suffer, combined with sympathetic concern. Self-compassion simply applies that to oneself. It is not self-pity, complaining, or wallowing in pain.
- Studies show that self-compassion buffers stress and increases resilience and self-worth.
- Self-compassion is hard for many people, due to feelings of unworthiness, self-criticism, or shame. 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
 - Then shift the compassion to yourself, perhaps with phrases like: “May I not suffer. May the pain of this moment pass.”

“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 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



Self-Directed Neuroplasticity

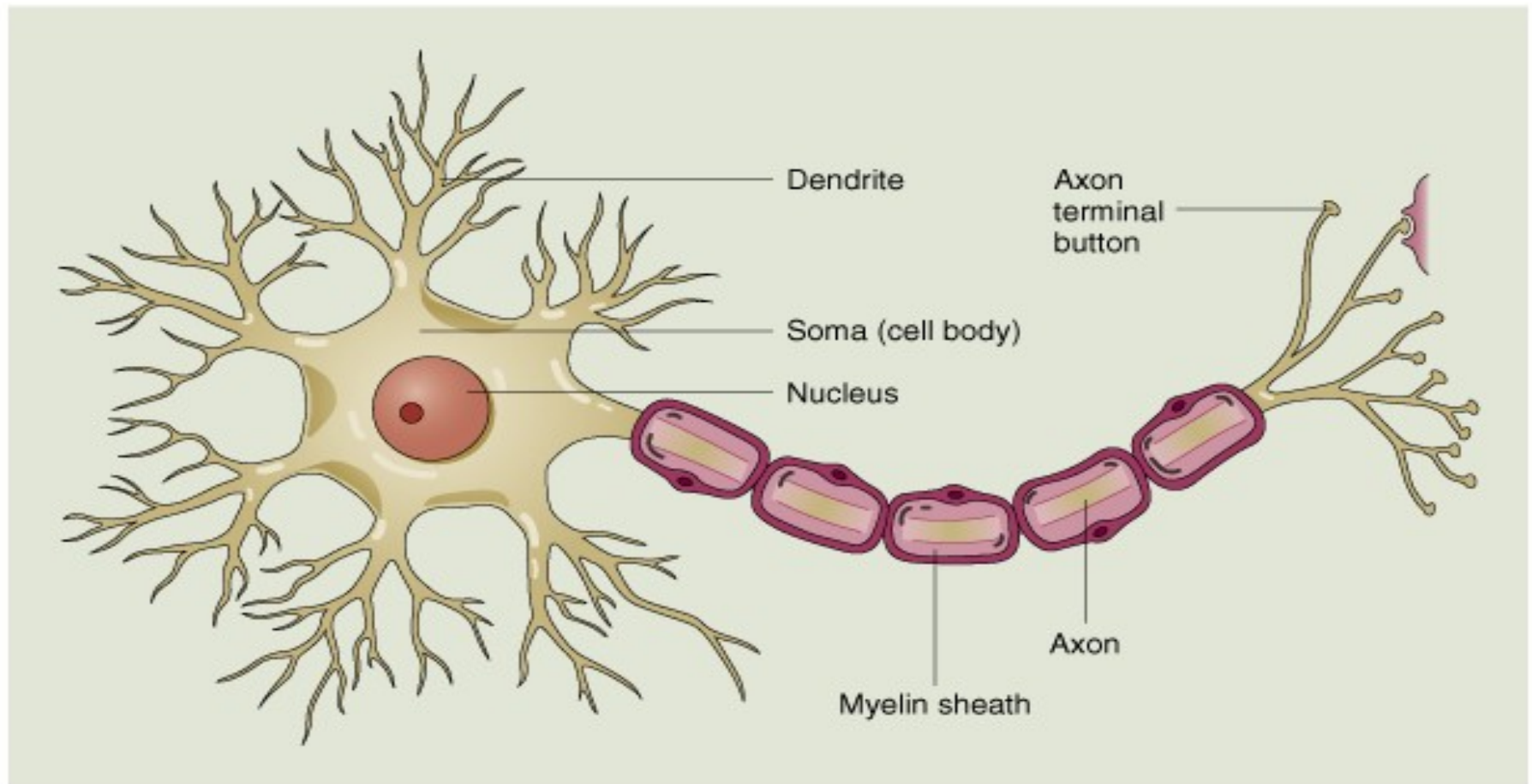


We ask, “What is a thought?”

*We don't know,
yet we are thinking continually.*

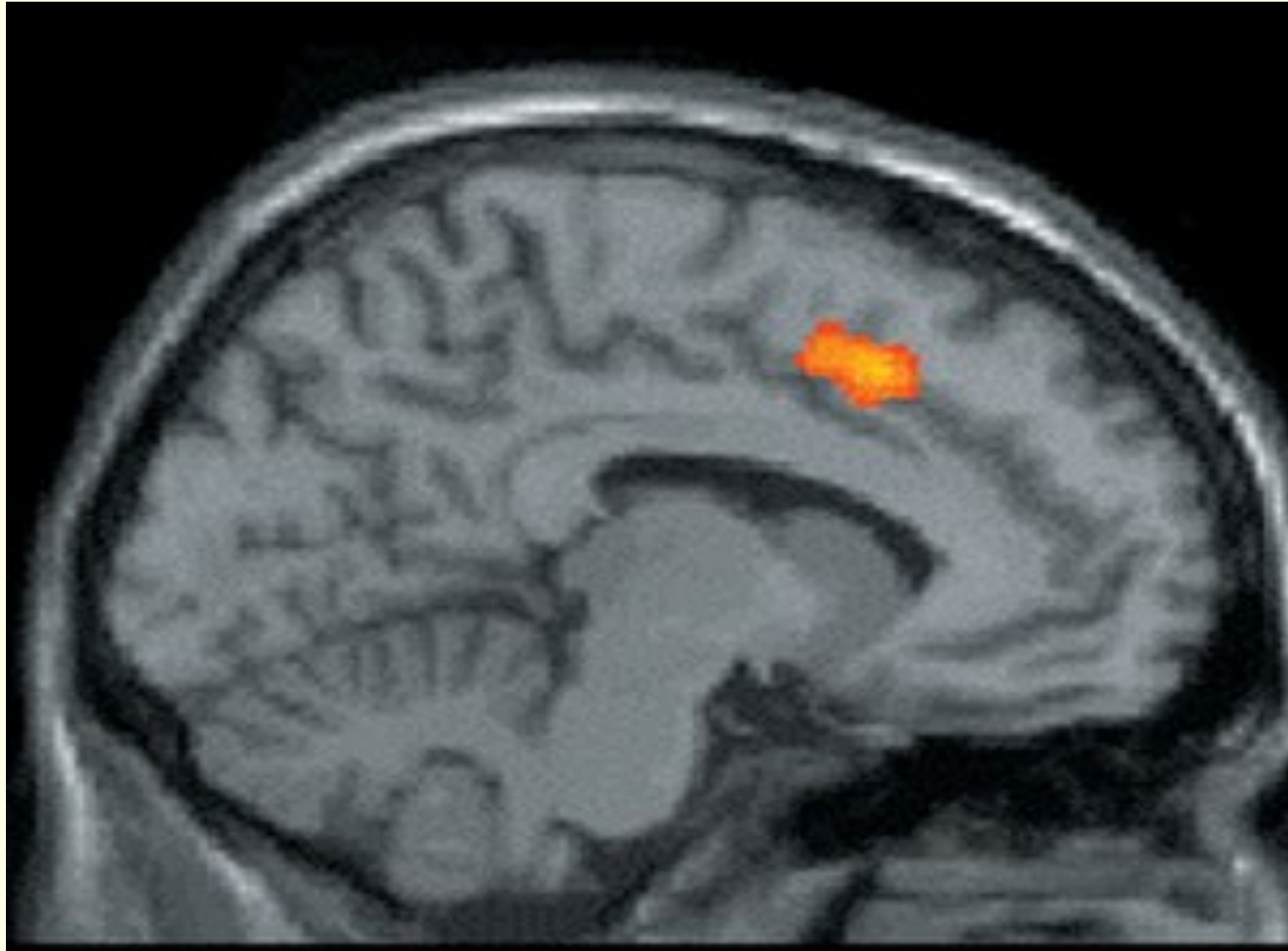
Venerable Tenzin Palmo

A Neuron



© 2000 John Wiley & Sons, Inc.

Ardent, Diligent, Resolute, and Mindful



The Neuropsychology of Learning

Learning – changing neural structure and function – has two stages:


From short-term memory buffers to long-term storage

From state to trait

From activation to installation.

Two Kinds of Memory (background)

- Learning creates **memory**, broadly defined: a lasting change in neural structure or function.
- **Explicit** memory: recollections, “semantic knowledge” (e.g., what is a bicycle)
- **Implicit** memory: “procedural knowledge” (e.g., how to ride a bicycle), expectations, biases, relationship paradigms, emotional residues of lived experience, acquired helplessness or resilience



**Inner strengths are grown from
experiences of them – activated
states – that are installed as traits.**

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

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

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



Installation

Installation

Installation



**Most experiences of inner strengths
are enjoyable.**

**They feel good because they are good
for us and others.**



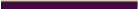
The Missing Link

**An activated state
is a necessary condition for learning,
but not a sufficient one.**


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



**Most of us are better at activation
but than we are at installation.**




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



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

Scott Miller



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



The Negativity Bias

Unpleasant Experiences In Context

- Life contains unavoidable unpleasant experiences. Resisting them just adds to the stress, upset, etc.
- Some inner strengths come only from unpleasant experiences, e.g., knowing you'll do the hard thing.
- But unpleasant experiences have inherent costs, in their discomfort and stress.
- Many inner strengths could have been developed without the costs of unpleasant experiences.
- Most unpleasant experiences are pain with no gain.

The Brain's Negativity Bias

As our ancestors evolved, avoiding “sticks” was more important than getting “carrots.”

1. So we scan for bad news,
2. Over-focus on it,
3. Over-react to it,
4. Install it quickly in implicit memory,
5. Sensitize the brain to the negative,

Sensitizing the Brain to the Negative

- Amygdala initiates stress response (“alarm bell”)
- Hippocampus:
 - Inhibits the amygdala
 - Inhibits cortisol production
- Cortisol:
 - Stimulates and sensitizes the amygdala
 - Inhibits and can shrink the hippocampus
- Consequently, chronic negative experiences:
 - Sensitize the amygdala alarm bell
 - Weaken the hippocampus: this reduces memory capacities and the inhibition of amygdala and cortisol production
 - Thus creating vicious cycles in the NS, mind, and behavior

The Brain's Negativity Bias

As our ancestors evolved, avoiding “sticks” was more important than getting “carrots.”


1. So we scan for bad news,
2. Over-focus on it,
3. Over-react to it,
4. Install it quickly in implicit memory,
5. Sensitize the brain to the negative, and
6. Create vicious cycles with others.

Velcro for Bad, Teflon for Good

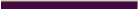
The negativity bias

bad experiences

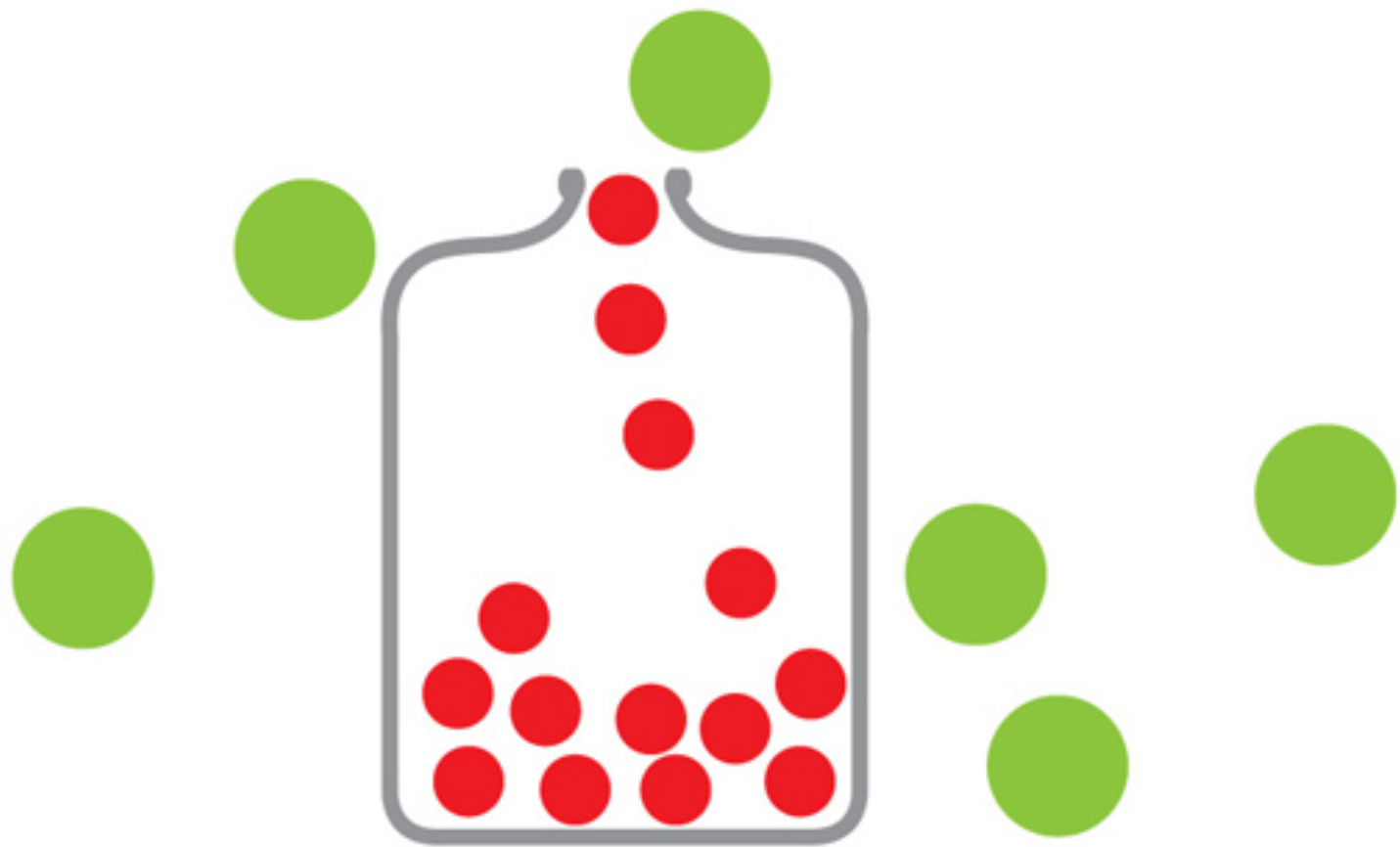
good experiences



**The brain is good
at learning from
bad experiences
but bad at learning from good ones.**



**Even though learning from
good experiences
is the primary way
to grow resources in the mind.**



The Negativity Bias

A composite image showing three Stone Age people in a modern city park. In the foreground, a man with long dark hair and a beard, wearing a loincloth, is crouching in a grassy field. Behind him, another man is sitting on the grass, and a woman is standing. In the background, there are large green bushes and a dense forest of trees. Behind the trees, several tall, modern city buildings are visible under a clear blue sky. 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.

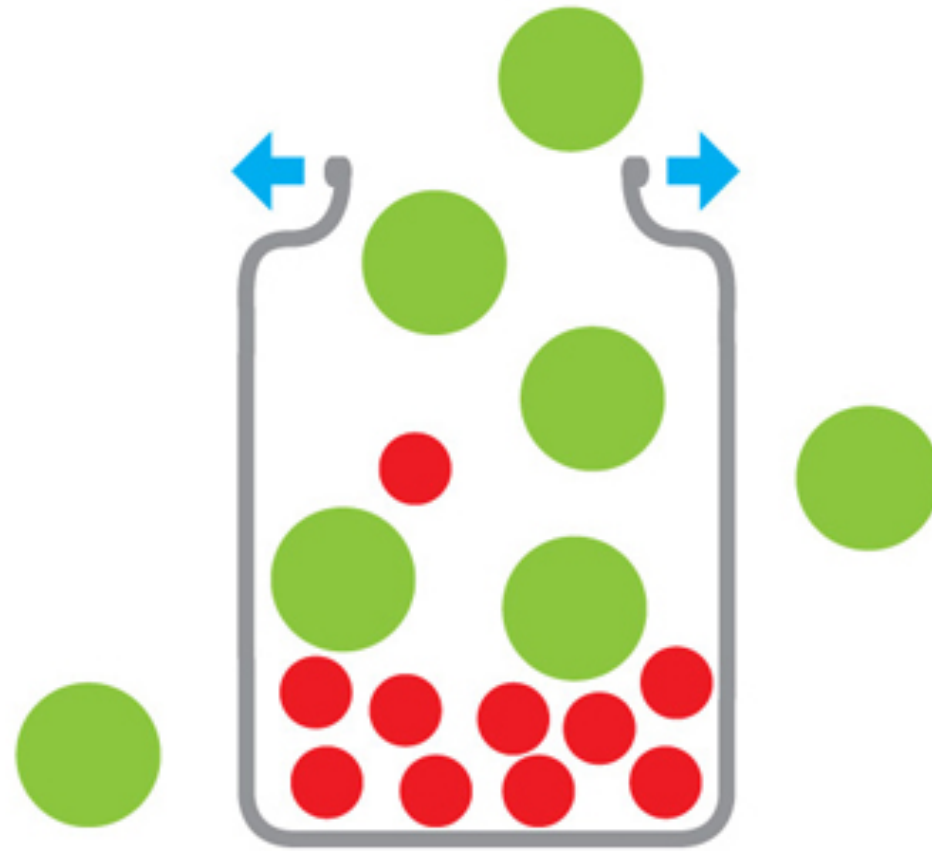
Stone age brains in the 21st century

**Pick a partner and choose an A and a B (A's go first).
Then you'll take turns, with one partner mainly
speaking while the other person listens, exploring
this question:**

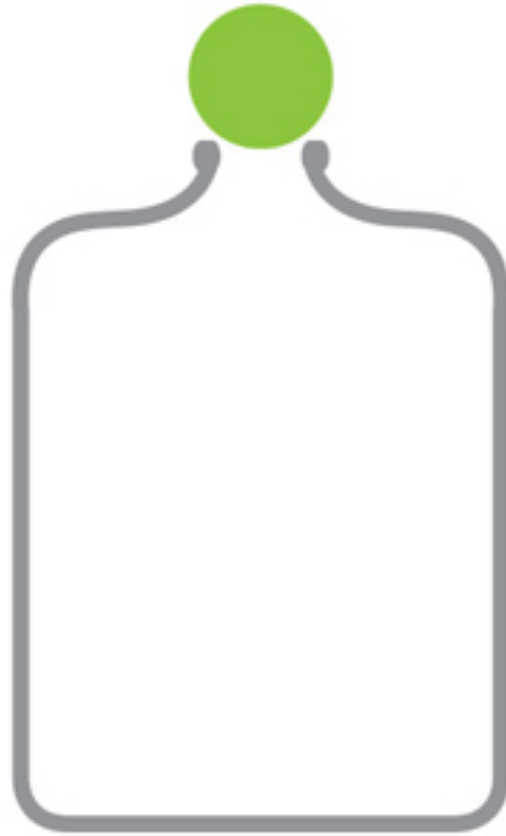
**How does the negativity bias operate in your
own mind, in your own life?**



Getting Good at Getting Better



Getting the Good Stuff into Your Brain



Have a Good Experience

Aspects of Experience

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

Two Ways To Have a Beneficial Experience

Notice one you are already having.

- In the foreground of awareness
- In the background

Create one.

Let's Try It

- **Notice** the experience already in awareness that you are basically alright right now.
- **Create** the experience of recalling an enjoyable time in nature.

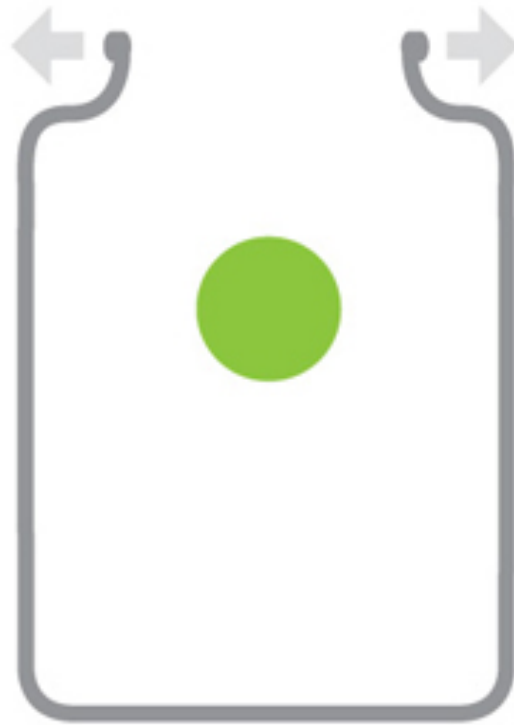
How to Create A Beneficial Experience (background)

Look for good facts in:

- 1. Immediate situation**
- 2. Current or recent events**
- 3. Stable conditions**
- 4. Your character**
- 5. The past**
- 6. The future**
- 7. Bad situations**
- 8. The lives of others**
- 9. Your imagination**
- 10. Care about others**
- 11. Directly evoke a beneficial experience**
- 12. Produce good facts**
- 13. Share about good facts with others**

Turning a Good Fact Into a Good Experience (background)

- Bring awareness to your body.
- Soften and open yourself.
- Be a little active in your mind, recognizing aspects of the good fact that naturally elicit an experience.
- Imagine how another person might naturally feel in response to the good fact.
- Have kindness for yourself, encouraging yourself to have a beneficial experience.



Enrich It

How to Enrich an Experience

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

Let's Try Enriching Gratitude

- Bring to mind one or more things you are thankful for or glad about.
 - Have the experience.
 - Enrich it through:
 - Duration
 - Intensity
 - Multimodality
 - Novelty
 - Salience



Absorb It

How to Absorb an Experience

- Enriching makes the experience more powerful.
Absorbing makes memory systems more receptive by priming and sensitizing them.
- Intend and sense the experience is sinking into you.
 - Imagery – Water into a sponge; golden dust sifting down; a jewel into the treasure chest of the heart
 - Sensation – Warm soothing balm
- Giving over to the experience; letting it change you
- Letting go of resisting, grasping, clinging: “craving”

Let's Try Absorbing Feeling Strong

- Bring to mind one or more times you felt strong.
 - Have the experience.
 - Enrich it.
 - Absorb it:
 - Intend and sense that it is sinking into you, becoming a part of you.
 - Be aware of what is rewarding or enjoyable about this experience.
 - Receive it and let it establish itself in you.

Like a Nice Fire

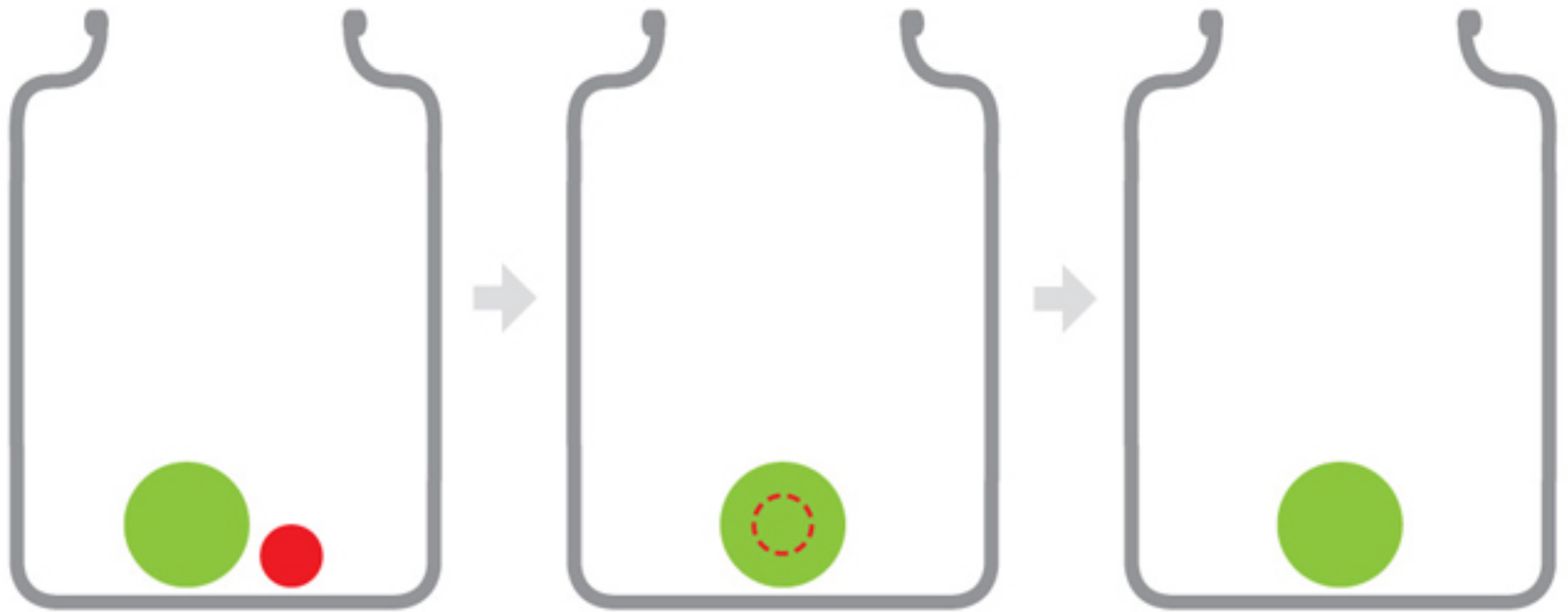
Have a fire (notice or ignite one).

Enrich it by protecting it and adding fuel to keep it burning.

Absorb its warmth into yourself.

Cautions, Blocks, and Adaptations

- **Cautions for people with:**
 - **severe depression**
 - **poor executive functions**
 - **high self-criticism**
 - **deliberate choiceless awareness**
- **Blocks are normal (e.g., “I don’t deserve to feel good”) and often a useful focus.**
- **Adapt target experiences and instructions based on setting, age, culture, etc.**



Link Positive and Negative Material

Keys to the Link Step

- **It's common in everyday life (e.g., talking about an upset with a friend) and widely used for personal growth (e.g., replacing harmful beliefs).**
- **The person must be able to:**
 - **Hold two things in awareness**
 - **Keep the positive one more prominent**
 - **Not get hijacked by the negative one**
- **Drop the negative if it's too powerful, and just do the first three (Have, Enrich, Absorb).**

The Tip of the Root

- For the fourth step of TIG, try to get at the youngest, most vulnerable layer of painful material.
- The “tip of the root” is commonly in childhood. In general, the brain is most responsive to negative experiences in early childhood.
- Prerequisites
 - Understanding the need to get at younger layers
 - Compassion and support for the inner child
 - Capacity to “presence” young material without flooding

Let's Try Linking Feeling Cared About

- Bring to mind one or more beings who care about you. Open to feeling included, seen, appreciated, liked, or loved.
 - Have the experience.
 - Enrich it.
 - Absorb it.
 - Link it:
 - While feeling cared about, also be aware of a mild sense of not being fully appreciated by someone, off to the side of your mind.

HEAL Yourself

Have a positive experience.

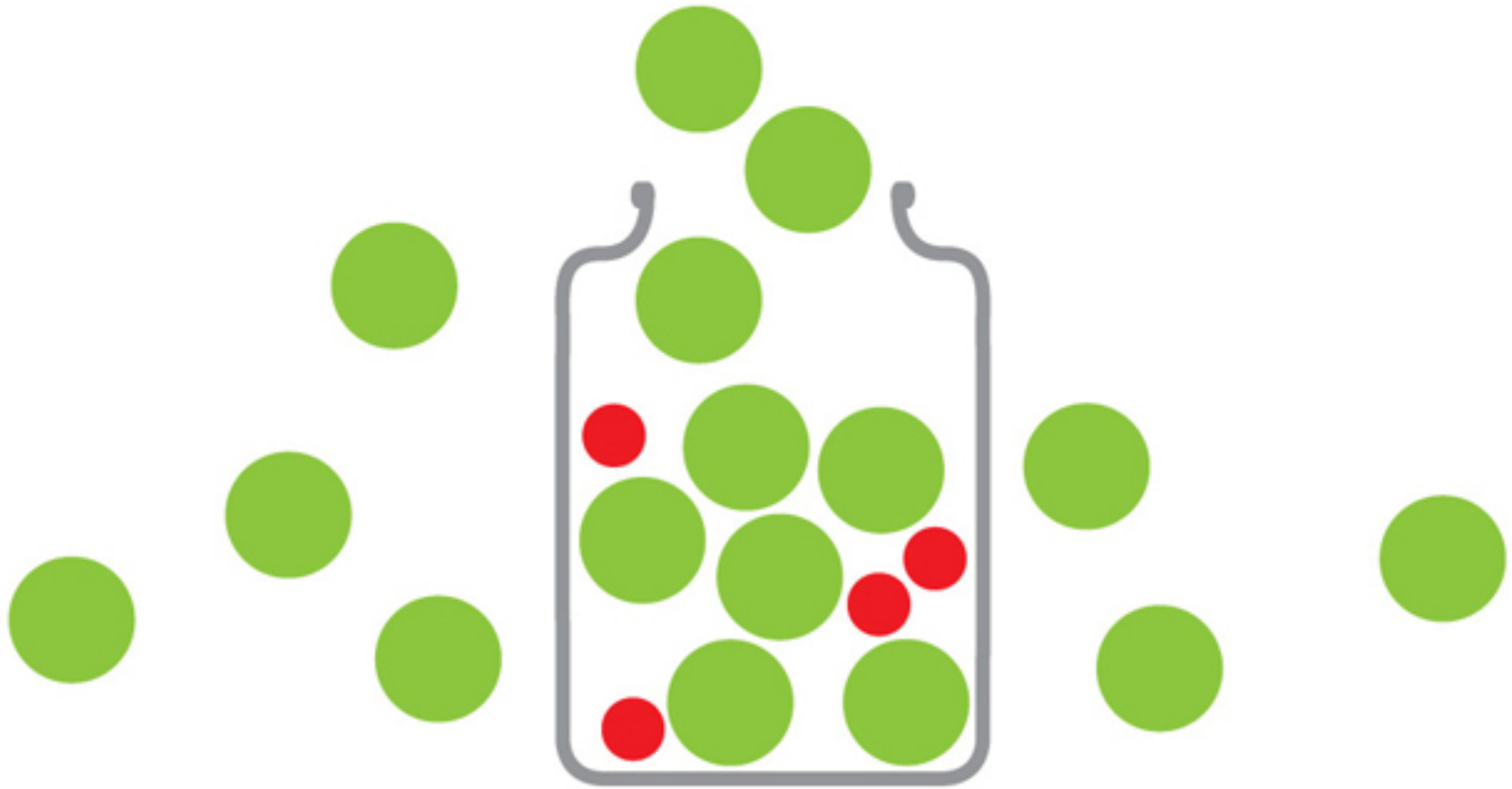
Enrich it.

Absorb it.

Link positive and negative material.

The Definition of HEAL

**The deliberate internalization
of beneficial experiences
in implicit memory**




Have It, Enjoy It



It's Good to Take in the Good

It's Good to Take in the Good

- Development of specific inner strengths
 - General - resilience, positive mood, feeling loved
 - Key resources – For challenges, deficits, wounds
- 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

In the Garden of the Mind

1. Be with what is there.
2. Decrease what's harmful.
3. Increase what's beneficial.

Witness. Pull weeds. Plant flowers.

Let be. Let go. Let in.

Mindfulness is present in all three.

“Being with” is primary – but not enough.

We also need “wise effort.”



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)

A Three-Legged Stool

- In the context of wisdom and virtue (*panna* and *sila*), practice is like a stool with three legs:
- ***Metta*** – warmheartedness, kindness, compassion
- ***Sati*** – mindfulness, concentration, seeing clearly
- ***Bhavana*** – cultivation, learning, growth

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Know the mind.

Shape the mind.

Free the mind.



Using HEAL with Others

The Four Ways to Offer a Method

- **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**

Using HEAL in Trainings

- Take five minutes to explain its rationale and teach it explicitly.
- In the flow, occasionally encourage enriching and absorbing, using natural language.
- Tell people they can use HEAL outside of class to deepen internalization of what they're learning.
- Don't use HEAL when it's inappropriate (e.g., radically choiceless awareness, highly self-critical about any kind of performance).

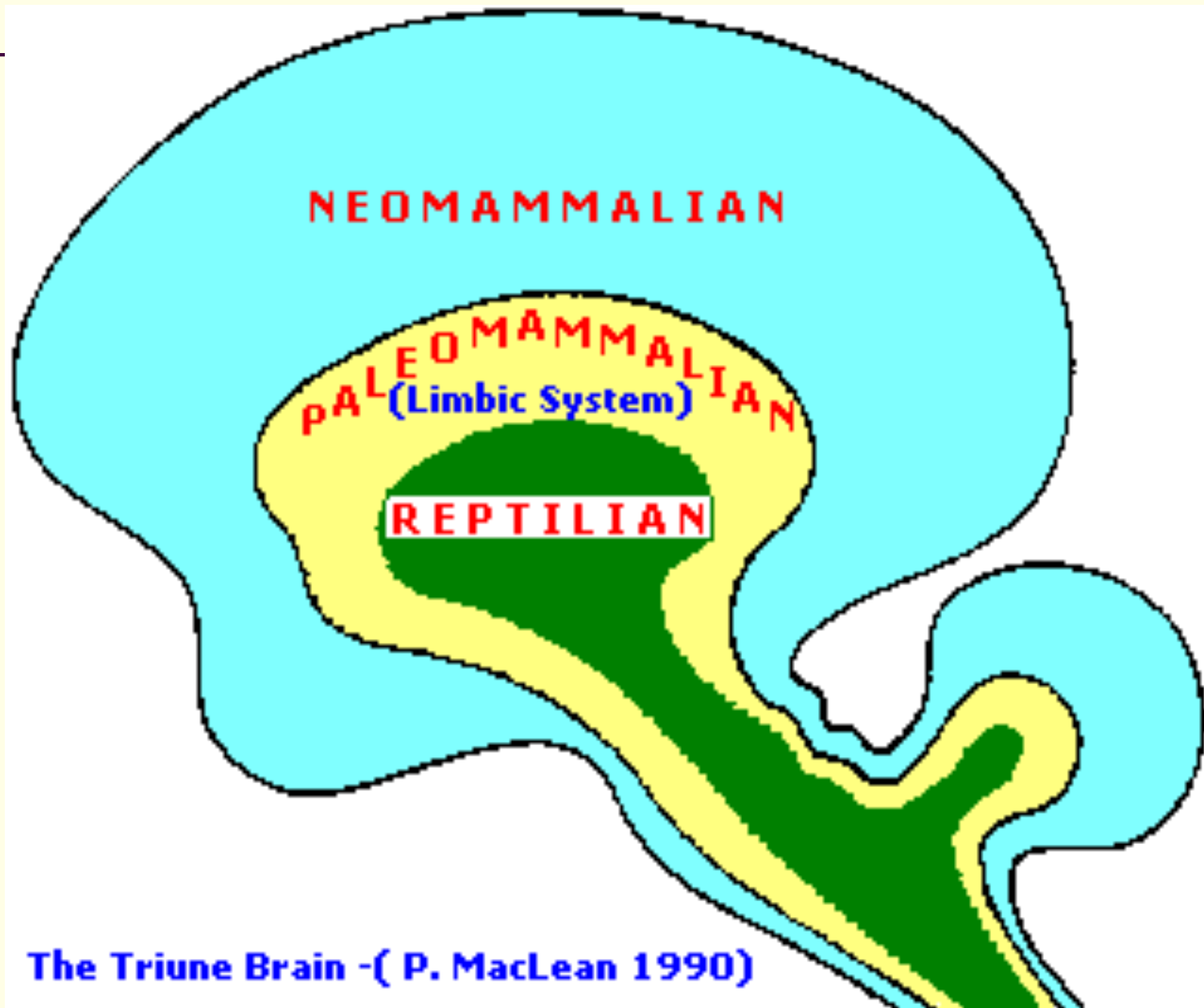


Growing Key Strengths

**What – if it were more present in the
mind of a person – would really help?**

**How could the person have more
experiences of this mental resource –
that are internalized in the brain?**

The Evolving 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”

Meeting Three Fundamental Needs

Need

Signal

Strategy

Safety

Unpleasant

Avoiding

Satisfaction

Pleasant

Approaching

Connection

Heartfelt

Attaching

Mental Resources for Challenges

Safety – Grit, protection, relaxation,
feeling alright right now, peace

Satisfaction – Gratitude, gladness,
accomplishment, contentment

Connection – Belonging, appreciation,
friendship, compassion, love

RESOURCES FOR AVOIDING HARMS

Challenge

Weakness

Helplessness

Freezing,
immobilization

Inflated threats

Alarm

Tension

Worry, fear

Irritation, anger

Resource

Strength

Agency

Action, venting

Accurate appraisal

Protection, calming

Relaxation

Feeling alright now,
making a plan

Big picture, peace

RESOURCES FOR APPROACHING REWARDS

Challenge

What I don't have

Scarcity

Disappointed, sad

Frustration, failure

Bored, numb

Grief

Giving up

Drivenness

Resource

What I do have

Enoughness,
fullness

Gratitude, gladness

Accomplishment

Pleasure, excitement

Loved and loving

Aspire, lived by good

Already satisfied

RESOURCES FOR ATTACHING TO OTHERS

Challenge

Left out, excluded
Inadequacy, shame
Ignored, unseen
Lonely

Resentment

Envy, jealousy

Feeling stifled

Resource

Belonging, wanted
Appreciated, respected
Receiving empathy
Friendship, caring
to others and oneself
Recognize it hurts you
Self-compassion, take
action, good will
Skillful assertiveness⁹⁸

Pet the Lizard



Feed the Mouse



Hug the Monkey



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Peace

Contentment

Love



The Buddha's Drive Theory of Suffering

**The Buddhist drive theory
(summarized in the Four Noble Truths)
says that “craving” – resisting the
unpleasant, chasing the pleasant, clinging to
the heartfelt, ignoring the neutral –
causes suffering.**

What causes “craving?”

Meeting Three Core Needs

Need

Signal

Strategy

Safety

Unpleasant

Avoiding

Satisfaction

Pleasant

Approaching

Connection

Heartfelt

Attaching

The Reactive Red Zone

When there is a presumed or 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** (Avoiding)
- **Frustration** (Approaching)
- **Heartache** (Attaching)

The brain in allostatic, **Reactive**, craving mode⁶

Reactive Dysfunctions in Each System

- **Avoid** - Anxiety disorders; PTSD; panic, terror; rage; violence
- **Approach** - Addiction; over-drinking, -eating, -gambling; compulsion; hoarding; driving for goals at great cost
- **Attach** – Insecure attachment; borderline, narcissistic, antisocial PDs; “looking for love in all the wrong places”

The Responsive Green Zone

With no presumed or felt deficit or disturbance of safety, satisfaction, and connection:

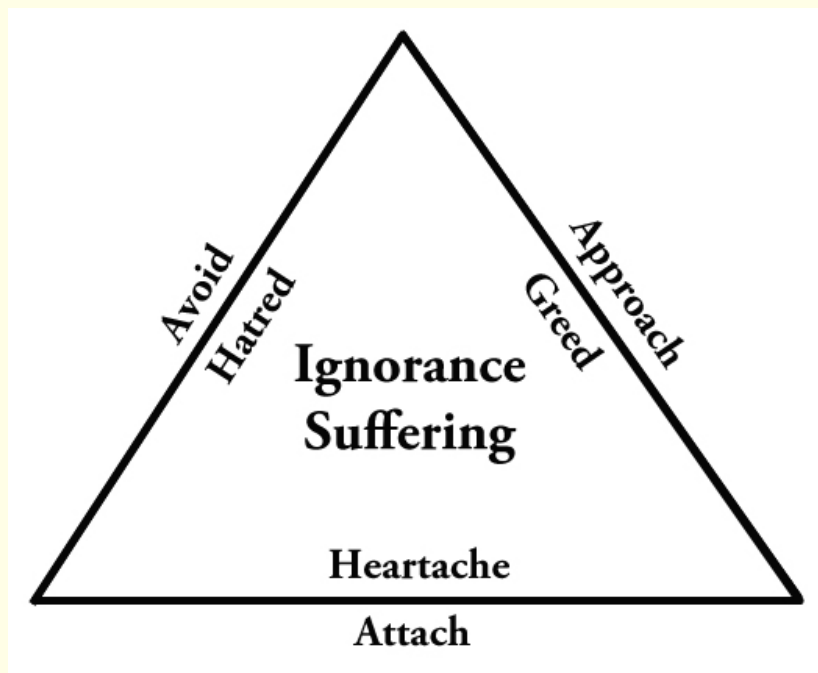
The body defaults to a sustainable equilibrium of refueling, repairing, and pleasant abiding.

The mind defaults to a sustainable equilibrium of:

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

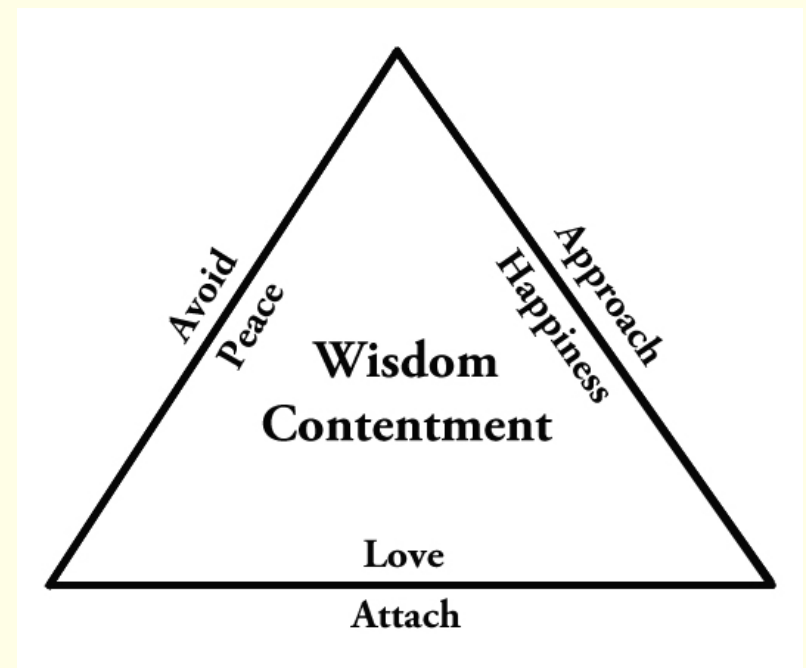
The brain in homeostatic, **Responsive**,
minimal craving mode

Choices . . .



Reactive Mode

Or?



Responsive Mode

Can You Stay in the Green Zone When:

Things are unpleasant?

Things are pleasant?

Things are heartfelt?



Coming Home, Staying Home

Experiences of core needs feeling met – the sense of safety, satisfaction, and connection: **peace, **contentment**, and **love** – restore or deepen healthy equilibrium in body and mind: the 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.



Larger Implications of Mindful Cultivation

Societal Implications

- For most of the time our human and hominid ancestors have lived, it was not possible to meet the core needs of everyone. But now the resources and know-how exist to do this. How we handle this unprecedented opportunity will be the central theme of this century.
- Improving external conditions is vital – but not enough. Many affluent people dwell in anxiety and anger, frustration and drivenness, and hurt and ill will.
- Repeatedly internalizing Responsive experiences develops a “green brain” that is harder to manipulate with threats and fear, greed and consumerism, and “us” vs. “them” rivalries. A critical mass of “green brains” could help bring a tipping point that changes the course of human history.

In the Days Ahead

- Make taking in the good an informal daily habit
- At the end of any formal practices – meditation, exercise, journaling, prayer, yoga, walking the dog – take a few moments to take in the benefits
- Know what your current “vitamin C” is – and look for opportunities to feel it and internalize it
- Be mindful of the hedonic tone of experiences – unpleasant, pleasant, heartfelt, neutral – and help yourself tip toward the green zone about them

*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.*



Peace

Contentment

Love

Thank you



Suggested 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.
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- 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.
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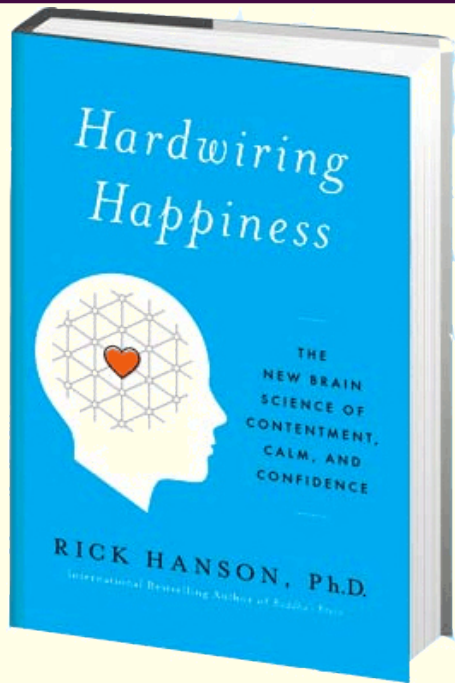
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