Your Best Brain:
Ten Great Ways
To Change Your Brain for the Better

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For Neuroscience and Contemplative Wisdom

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Introduction
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
Great questioning, great enlightenment;
little questioning, little enlightenment;
no questioning, no enlightenment.

Dogen
Your Brain: The Technical Specs

- **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 of a second

- **Connectivity:**
  - Typical neuron makes ~ 5000 connections with other neurons:
    ~ 500 trillion synapses
A Neuron

- Dendrite
- Soma (cell body)
- Nucleus
- Axon terminal button
- Axon
- Myelin sheath

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Physical Methods
Key Physical Interventions for the Brain

- Provide a complete array of nutrients.
- Get the gut right.
- Optimize serotonin.
- Increase GABA/glutamic acid ratio.
- Enhance excitatory neurotransmitters.

And exercise!
Provide a Complete Array of Nutrients
Perspectives on Natural Methods

Potential benefits:
- Often highly effective
- Minimal side effects (pure molecules that the body knows how to metabolize)
- Readily available

But use wisely:
- Gather information.
- Don’t do on your own with psychotropic meds.
- Start with low doses.
- If something does not feel good, stop.
- Make sure other co-factors are adequate (e.g., B-6, iron).
- Consider further testing (e.g., amino acids).
Key Functions of Nutrients

- Build tissue
- Act as substrate for metabolic processes
- Act as co-factors for enzymes that facilitate metabolic steps
- Act as anti-oxidants
Nutrients from Food - 1

- **Protein:**
  - 3 servings a day, the size of the palm of your hand
  - Animal protein: well absorbed, hypoallergenic
  - Nuts and seeds
  - Protein powder
  - Vegetarians: consider an amino acid supplement

- **Vegetables and fruits:**
  - Vegetables: at least several cups a day
  - Primary source of carbohydrates
  - Fruit: eat whole fruit; be mindful of sugar content
Nutrients from Food - 2

- Grains:
  - Not so much
  - Whole grains, not made into flour
  - Gluten-free (gluten = wheat, oats, rye, barley, spelt, kamut)

- Oils:
  - Primary oil is olive
  - No trans-fats
  - Be mindful of saturated fats
Dairy:
- Try to eliminate cow dairy -- a major allergen
- Goat and sheep products are best
- Substitute with almond milk, coconut milk, etc.

Go paleolithic!
- Eat like the hunter-gatherers did -- that is your evolutionary heritage.
- Animal protein, vegetables, fruit, eggs, nuts, healthy oils.
Nutrition From Food - 4

- Eat No Sugar and little refined flour . . .

- If you must, eat as little sugar as possible.
  - The average American eats 158 lbs per year.
  - Sugar raises and dysregulates blood sugar.
  - Sugar raises insulin and puts you on the road to diabetes.
  - High insulin is inflammatory.
  - Increased risk of Alzheimer’s disease and depression with diabetes
  - Decreases cognitive performance
Supplement B-Vitamins

- Start with a good multi-vitamin/mineral supplement, with high B-vitamins (10x DVs for B’s and 800 mcg folic acid, ideally as 5-methyl-tetrahydrofolate)

- Folate, B-12, and B-6 cut brain shrinkage in half in older mildly cognitively impaired adults with high homocysteine. Take B-12 under the tongue.

- Low folate predisposes people to depression.

- Folic acid + SSRI almost doubles success rate over SSRI alone.
Supplement Minerals

- The multi should have the DV or more of zinc, copper, selenium, manganese, molybdenum, chromium, iodine.

- Typically add calcium and magnesium:
  - At least 400 mg. magnesium.
  - Women should consume at least 1000 mg. calcium.

- Iron:
  - A critical brain nutrient, but toxic if you get too much.
  - Carnivorous men usually shouldn’t add iron.
  - Menstruating women usually do need iron.
  - It’s best to test for iron with an iron panel or serum ferritin.
  - A blood count helps, but can miss low iron.
  - If you have fatigue and/or depression, test.
Supplement Essential Fatty Acids

- Much DHA (decosahexaenoic acid) in the brain
- DHA & EPA (ecosipentanoic acid) are important regulators of inflammation.
- EPA & DHA negatively correlate with depression (DHA has more data)
- May be preventive for Parkinson’s and Alzheimer’s.
- Fish oil: 500 mg. each of EPA and DHA
Supplement Vitamin D

- Co-factor in synthesis of serotonin, dopamine, and norepinephrine
- Low levels of D are implicated in depression.
- Major support for the immune system
- May be helpful in preventing dementia and Parkinson’s disease
- Made in the skin from unprotected sunlight
- Get 10 - 15 minutes sun mid-day; do not burn.
- Goal for D: 50 - 60 ng./ml. The correct test is “25-OH-vitamin D.”
- If you cannot test, try 2000 I.U./day.
About Supplements

Most supplements are available at health food stores.


If you want to check the formulas of vitamin, mineral, or amino acid products at health food stores, etc., you can compare them to products on my website.

For comparisons, look on my site at the Twice Daily Multi, and BAM or All Basic Plus amino acid mixes.
Get the Gut Right
The GI Tract and the Brain

- The road to health is paved with good intestines.
  - Our gastrointestinal (GI) tract has a huge effect on our brain.
  - We can have a huge effect on our GI tract.
  - Key issues: cytokines, malabsorption, dysbiosis

- GI tract effects on the brain via the immune system:
  - 60 - 70% of the immune system is in the GI tract.
  - When the GI tract is inflamed, it sends messengers called *cytokines* throughout the body - including the brain - causing inflammation and trouble.
  - By activating a particular enzyme, cytokines deplete the brain of serotonin.
  - Cytokines stimulate hypothalamic-pituitary stress pathway, resulting in higher stress hormones, including cortisol.
GI Malabsorption

- When the intestines are inflamed, malabsorption of nutrients occurs.

- Malabsorption decreases amino acids, iron, folic acid, and fats. (And probably all nutrients).

- We need these nutrients for brain health.
Increase Beneficial Microflora #1

There are trillions of bacteria in the intestines.
- Beneficial bacteria protect intestinal walls, help build vitamins, and decrease inflammation and bad microbes.
- Pathogenic bacteria cause inflammation.

Increase beneficial bacteria:
- Eat a low sugar, low refined flour, high fiber diet.
  - Bad bugs like sugar; good bugs like fiber.
- Supplement probiotics:
  - Lactobacillus GG (Culturelle)
  - Saccharomyces boulardii (Florastor)
  - Bifido-biffidus (particularly for kids)
  - Lactobacillus paracasei, casei, plantarum, rhamnosus, and salivarius
Increase Beneficial Microflora #2

- Dosing multi-strain probiotics
  - Must sustain treatment: probiotics bloom then leave within two weeks
  - 5 billion CFUs (colony forming units) per day for ongoing healthy GI support
  - 25-50 billion CFUs for GI repair
  - 450 billion - 3.6 trillion CFUs: ulcerative colitis (VSL #3)

- Make your own yogurt or kefir
  - Dairy-free recipes using coconut milk are on-line.
  - Add your own probiotics.
  - Most supermarket brands have no active probiotics.
Decrease Pathogenic Microbes

- Get rid of bad bugs: parasites, yeast overgrowth, and bacterial overgrowth.

- You may need to test to identify pathogens. A comprehensive stool test is offered by integrative practitioners.
  - My favorite test is one that uses DNA to identify and quantify microbes -- it is very accurate.

- Treat microbes as appropriate. If possible use natural products. Parasites usually require prescription medication, and perhaps a long treatment.
Eliminate Food Allergens

- Food allergens cause inflammation and reactivity all over the body.
  - No down side, except giving up your favorite foods
  - Dramatic effects on mood and energy
  - Particularly noticeable in children

- The worst offenders are gluten and dairy, then soy.
  - Gluten: wheat, oats, rye, barley, spelt, kamut
  - Dairy: cow is usually worse than goat and sheep.

- Test:
  - Try a couple weeks off.
  - Or you can do an IgG antibody test (through integrative practitioners).
Optimize Serotonin
Working with Neurotransmitters

- Two core functions of neurotransmitters:
  - Calming down - Inhibitory
  - Energizing up - Excitatory

- You can supplement neurotransmitters or their co-factors - in a context of overall health.

- Individual differences:
  - More benefit from inhibitory neurotransmitters
Inhibitory and Excitatory Neurotransmitters

- **Inhibitory:**
  - Serotonin
  - GABA

- **Excitatory:**
  - Norepinephrine
  - Dopamine
  - Acetylcholine
  - Glutamic acid (glutamate)
A Neuron
A SYNAPSE

Axon Terminal

Presynaptic membrane neurotransmitter released by exocytosis

Mitochondrion produce ATP

Synaptic vesicles contain neurotransmitter

Synaptic Cleft

Postsynaptic membrane has receptors for neurotransmitters

Dendrite of second neuron
Serotonin Effects

- Serotonin is the key neurotransmitter for “happy and relaxed.”

- Serotonin is a neuro-modulator of GABA that increases its effects, and also helps decrease overactive norepinephrine, dopamine, adrenaline, and cortisol.

- Major effect on depression and anxiety
Serotonin Production and Supplementation

- Tryptophan (with iron) -> 5-hydroxytryptophan (5-HTP) (with B-6 [P-5-P]) -> serotonin

  \[ \text{I} \rightarrow \text{melatonin} \]

- Options for increasing serotonin:
  - 5-HTP, 50 - 200 mg./day; empty morning stomach
  - Tryptophan: 500 - 1500 mg./day; before bed (great for sleep)

- Stop if it doesn’t feel good.
Serotonin and “Prozac Poop-Out”

- Serotonin is eliminated from the synapse through re-uptake, which SSRI’s prevent, or through degradation by monoamine oxidase (MAO).

- A theory: when the uptake of serotonin is inhibited, it leaves more serotonin available for breakdown by MAO. This could increase MAO action over time, thus depleting available serotonin.

- Possibly: add a little (50 mg.) 5-HTP. Be very careful -- if it feels at all wrong, stop.
St. John’s Wort

- **Neurochemistry:**
  - Many pathways of action due to molecular complexity
  - Uptake inhibitor of serotonin and probably dopamine and norepinephrine; mild MAO inhibitor
  - If the drug companies could make this, they would!

- **Dosing:** 300 mg. 3 times per day

- **Concerns about decreasing the effectiveness of other medications:**
  - Do not use with protease inhibitors for HIV.
  - Unproven concern with birth control pills, but be mindful
Increase GABA/Glutamic Acid Ratio
GABA and Glutamic Acid: Overview

- GABA and glutamic acid (GA) have a dance in the brain. GABA is Yin (inhibitory) and Glutamic Acid is Yang (excitatory).

- Too much GA feels like a monosodium glutamate (MSG) overdose.

- High GA and/or low GABA are associated with:
  - Anxiety, depression, bipolar disorder
  - Migraines, seizures
  - Parkinson’s disease
  - Schizophrenia
Supplement Magnesium

- Supplementing magnesium increases GABA.

- Studies on migraines, seizures, pre-enclampsia found magnesium to be effective.

- Take 400 - 1000 mg. magnesium.
  - Magnesium citrate will likely be a laxative.
  - Magnesium glycinate is not usually a laxative.
Supplement Vitamin B-6

- Glutamic acid --> GABA

- Vitamin B-6 as Pyridoxal-5-Phosphate (P-5-P) is the key nutritional co-factor that shifts the balance in the direction of GABA.

  - Take 50 mg./day of P-5-P on an empty stomach.

  - Many don’t make P-5-P from pyridoxine effectively.

  - Often deficient in women on birth control pills.
Supplement Taurine

- Taurine binds to GABA receptors, thus stimulating GABA-like activity.

- It stimulates enzymes that make GABA, and inhibits enzymes that break it down.

- It’s typically a benign amino acid, also depleted during breastfeeding.

- Consider 1000 mg./day (maybe more).
Supplement Melatonin

- Melatonin blocks the main glutamate receptor.

- Get good sleep. Take the time. Sleep is perhaps the most restorative activity for the brain.

- For sleep, use 1 - 3 mg. melatonin before bed, or a smaller amount for middle-of-the-night waking. Try sublingual preparations.
Supplement Theanine

- Theanine is an amino acid found in green tea and added to soft drinks in Japan (!).
- It is “antagonistic” to glutamic acid.
- Consider 100 - 200 mg./day.
Supplement GABA

- Theoretically, GABA does not cross the blood-brain barrier, but many people do report a calming effect.
- Possibly there is a “leaky brain syndrome” allowing GABA to get through.
- Several studies show efficacy of GABA with anxiety.
- Consider 250 - 750 mg./day on an empty stomach.
Supplement Progesterone

- For women only . . .

- Progesterone stimulates GABA receptors, triggering a GABA-like effect.

- Approaching menopause, progesterone decreases before estrogen does, so supplementing progesterone may be helpful.

- Consider Pro-Gest cream, during the second half of your cycle.
Possible Daily Supplements for Enhancing GABA/Glutamic Acid Ratio

- Magnesium: 400 - 1000 mg. citrate (lax.) or glycinate (non-lax.)
- Vitamin B6 as P-5-P: 50 mg. on an empty stomach
- Taurine: 1000 mg. (or more) on an empty stomach (in a.m.)
- Melatonin 1-3 mg.
- Theanine: 100 – 200 mg.
- GABA: 250 - 750 mg.
- Progesterone cream (women only)
- Tryptophan or 5-HTP to enhance serotonin --> modulates GABA
Enhance Excitatory Neurotransmitters
Increasing Amino Acids in General

- When fatigue is an issue, even chronic fatigue, a complete amino acid blend can be very useful.
  - Taken on an empty stomach, it temporarily strongly boost amino acids levels.
  - The theory is, it primes the pump and gets the body and brain going.

- Use a free amino acid balanced blend:
  - Take 30 minutes before food in the morning.
  - 3 - 10 grams
  - Can modify with amino acid testing
  - Make sure vitamin and mineral co-factors are present.
Enhance Dopamine, Norepinephrine

- Increase dopamine and norepinephrine, which support attention, energy, and mood.

- Phenylalanine (with iron) -> tyrosine (with P-5-P) -> dopamine -> norepinephrine.

- Tyrosine also builds thyroid hormone.

- On a foundation of good serotonin, supplement:
  - 500-1000 mg./day of L-Phenylalanine or L-Tyrosine (empty stomach in the morning)
  - 50 mg./day of P-5-P (empty stomach in the morning)
  - Supplement iron as indicated by testing.
Enhance Acetylcholine #1

- Phosphatidylserine:
  - A structural component of a neuron’s membrane
  - Enhances acetylcholine release
  - Calms stress pathways in the brain, reducing cortisol
  - Many studies show decreased cognitive decline with aging
  - 100 - 300 mg./day

- Acetyl-L-Carnitine:
  - Enhances acetylcholine
  - Studies show decreased cognitive decline with aging and decreased progression of Alzheimer’s disease.
  - 500 - 1000 mg./day
Enhance Acetylcholine #2

- Alpha GPC (glycerylphosphorylcholine) stimulates manufacture of new acetylcholine by providing a supply of choline for neurons.

- Stimulates release of GABA

- Benefits shown for memory, stroke, Alzheimer’s, and vascular dementia.

- Try 300 - 600 mg. (By prescription in Europe)
Enhance Acetylcholine #3

- Huperzine A. is extracted from Chinese club moss. It helps prevent breakdown of acetylcholine.

- Some studies have shown effectiveness with Alzheimer’s disease; one study showed improved memory in adolescents.

- 50 - 200 mg./day. Start slow. Although studies say no side effects, I have seen them.
Bonus #6: Hormones

- Check thyroid if fatigue is a factor.
  - TSH should ideally be under 2.00, but certainly under 3.00.

- Estrogen does many good things for the brain:
  - Improves mood
  - Supports memory
  - Helps prevent dementia

- Menopausal women should test estrogen levels and consider supplementation.
  - Always bioidentical
  - Always transdermal -- patch, cream, or spray
Mental Methods
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
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”
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?
Key Mental Interventions for the Brain

- Spacious awareness
- Taking in the good
- Loved and loving
- Restorative relaxation
- Natural happiness
Spacious Awareness
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 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
## Dual Modes

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<tr>
<th>“Doing”</th>
<th>“Being”</th>
</tr>
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<tbody>
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<td>Mainly sensory</td>
</tr>
<tr>
<td>Much verbal activity</td>
<td>Little verbal activity</td>
</tr>
<tr>
<td>Abstract</td>
<td>Concrete</td>
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<tr>
<td>Future- or past-focused</td>
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<tr>
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Increased **Medial** PFC Activation Related to Self-Referencing Thought

Self-Focused (blue) and Open Awareness (red) Conditions (following 8 weeks of MT)

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Ways to Activate “Doing” Mode

- Enter the “default mode” of the brain; run mini-movies in the mental simulator
- Sense a threat or opportunity; “crave” or “cling”
- Focus on a task; solve a problem; plan
- Think with language
- Reflect about future or past
- Take life personally
Ways to Activate “Being” Mode

- Relax
- Focus on bare sensations and perceptions
- Sense the body as a whole
- Take a panoramic, “bird’s–eye” view
- Engage “don’t-know mind”; release judgments
- Don’t try to connect mental contents together
- Let experience flow, staying here now
- Relax the sense of “I, me, and mine”
Whole Body Awareness

- Sense the breath in one area (e.g., chest, upper lip)
- Sense the breath as a whole: one gestalt, percept
- Sense the body as a whole, a whole body breathing
- Sense experience as a whole: sensations, sounds, thoughts . . . all arising together as one unified thing
- It’s natural for this sense of the whole to be present for a second or two, then crumble; just open up to it again and again.
Taking in the Good
Mindfulness, Virtue, Wisdom

- **Mindfulness**, **virtue**, and **wisdom** are identified in both Western psychology and the contemplative traditions as key pillars of mental health.

- These map to three core 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.
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 impact 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 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.
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.
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
Psychological Antidotes

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

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

Avoiding Threats
- Strength, efficacy --> Weakness, helplessness, pessimism
- Safety, security --> Alarm, anxiety
- Compassion for oneself and others --> Resentment, anger
How to Take in the Good

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Loved and Loving
The Social Brain

- Social capabilities have been a primary driver of brain evolution.

- Reptiles and fish avoid and approach. Mammals and birds *attach* as well - especially primates and humans.

- Mammals and birds have bigger brains than reptiles and fish.

- The more social the primate species, the bigger the cortex.

- Since the first hominids began making tools ~ 2.5 million years ago, the brain has roughly tripled in size, much of its build-out devoted to social functions (e.g., cooperative planning, empathy, language). The growing brain needed a longer childhood, which required greater pair bonding and band cohesion.
All sentient beings developed through natural selection in such a way that pleasant sensations serve as their guide, and especially the pleasure derived from sociability and from loving our families.

Charles Darwin
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
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.

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 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
A human being is a part of a whole, called by us “universe,” a part limited in time and space. He experiences himself, his thoughts and feelings as something separated from the rest... a kind of optical delusion of his consciousness.

This delusion is a kind of prison for us, restricting us to our personal desires and to affection for a few persons nearest to us.

Our task must be to free ourselves from this prison by widening our circle of compassion to embrace all living creatures and the whole of nature in its beauty.

Albert Einstein
If we could read the secret history of our enemies, we should find in each [person's] life sorrow and suffering enough to disarm any hostility.

Henry Wadsworth Longfellow
Compassion and Kindness

- Good heart
  - Feeling cared about and caring
  - Warming the heart itself
  - Heartmath

- Good wishes: safety, health, happiness, ease

- All beings, “omitting none”
  - Self
  - Benefactor
  - Friend
  - Neutral person
  - Difficult person
Restorative Relaxation
Health Consequences of Chronic Stress

- Physical:
  - Weakened immune system
  - Inhibits GI system; reduced nutrient absorption
  - Reduced, dysregulated reproductive hormones
  - Increased vulnerabilities in cardiovascular system
  - Disturbed nervous system

- Mental:
  - Lowers mood; increases pessimism
  - Increases anxiety and irritability
  - Increases learned helplessness (especially if no escape)
  - Often reduces approach behaviors (less for women)
  - Primes aversion (SNS-HPAA negativity bias)
One Neural Consequence of Negative Experiences

- Amygdala ("alarm bell") initiates stress response
- Hippocampus:
  - Forms and retrieves contextual memories
  - 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, behavior, and mind
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Cooling the Fires

- Regard stressful activation as an affliction.

- Lots of methods for stimulating the parasympathetic nervous system to down-regulate the SNS:
  - Big exhalation
  - Relaxing the body
  - Yawning
  - Fiddling the lips

- Get in the habit of rapidly activating a damping cascade when the body activates.

- Regard bodily activation as just another compounded, “meaningless,” and impermanent phenomenon; don’t react to it.
Feeling as Safe as You Reasonably Can

- Connecting with others; finding allies; internalizing self-encouraging, -nurturing, -soothing, -coaching resources

- Feeling strong

- Waking up from Threat Level Orange:
  - Recognizing real threats
  - Not getting alarmed at paper tigers
  - Recognizing inner and outer protections and resources
Natural Happiness
Evolutionary History

The Triune Brain

The Triune Brain - (P. MacLean 1990)
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”
Reverse Engineering the Brain

What is the nature of the brain when a person is:

- In peak states of productivity or “flow?”
- Experiencing inner peace?
- Self-actualizing?
- Enlightened (or close to it)?
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

- Avoid
- Peace
- Love

- Approach
- Happiness
- Attach

Wisdom
Contentment
Key Benefits of Responsive Mode

- Fueling for Reactive mobilizations; recovery after
- Positive emotions, cognitions, and behaviors
- Positive cycles
- Promotes virtue and benevolence

*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
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

- Avoid
- Hatred
- Greed

- Ignorance
- Suffering

- Heartache
- Attach

- Approach
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”
Choices . . .

Or?

Reactive Mode

Responsive Mode
Coming Home . . .

Peace

Happiness

Love
Penetrative insight

joined with calm abiding

utterly eradicates

afflicted states.

Shantideva
Great Books

See www.RickHanson.net for other great books.

Key Papers - 1

See www.RickHanson.net for other scientific papers.


Key Papers - 2


- 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


Key Papers - 4


