Brain Science
And Psychotherapy:
What’s the Next Step?

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Rick Hanson, Ph.D.
The Wellspring Institute for Neuroscience and Contemplative Wisdom
WiseBrain.org  RickHanson.net
Topics

- Self-directed neuroplasticity
- Benefits and pitfalls of neuroscience in therapy
- Growing inner strengths
- Taking in the good
Self-Directed Neuroplasticity
A Neuron

- Dendrite
- Soma (cell body)
- Nucleus
- Axon terminal button
- Axon
- Myelin sheath
Mental activity entails underlying neural activity.
Steadiness of Mind
Repeated mental activity entails repeated neural activity.

Repeated neural activity builds neural structure.
Neurons that fire together, 
wire together.
Self-Directed Neuroplasticity

We can use the mind

To change the brain

To change the mind for the better

To benefit ourselves and other beings.
Benefits and Pitfalls

Of Bringing
Neuroscience into Psychotherapy
Grounding in the Brain – Benefits 1

- **Innovating**
  - Neurofeedback
  - Erasing fear memories, not just over-writing them
Grounding in the Brain – Benefits 2

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- **Organizing**
  - Human DNA and brain; evolutionary neuropsychology
  - Common ground across perspectives and practices
Grounding in the Brain – Benefits 3

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- **Motivating**
  - Concrete, in the body, *physical*; efforts bear tangible fruit
  - Status of medicine, hard science
Grounding in the Brain – Benefits 4

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- **Highlighting**
  - Nonverbal affective and somatic processes
  - *Installation phase of learning – need to turn passing mental states into stable neural traits for any lasting value*
We shall not cease from exploration
And the end of all our exploring
Will be to arrive where we started
And know the place for the first time.

T. S. Eliot
To see what is in front of one’s nose takes a constant struggle.

George Orwell
Grounding in the Brain – Pitfalls 1

- **Over-simplifying**
  - Over-localizing function (e.g., empathy = mirror neurons)
  - Exaggerated, compelling terms (“God-gene,” “female brain”)
Grounding in the Brain – Pitfalls 2

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  - Replacing psych terms with neuro (“the amygdala made me do it”)
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  - Asserting power with clients; propelling career success
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- **Underestimating the mind**
  - Most big changes in *psych* involve tiny changes in *soma*; mental plasticity holds more promise than neural plasticity.
  - Ducking existential choices in values; naturalistic fallacy
Growing Inner Strengths
Two wolves in the heart
Inner Strengths Include

- **Capabilities** (e.g., mindfulness, insight, emotional intelligence, resilience, executive functions, impulse control)

- **Positive emotions** (e.g., gratitude, self-worth, love, self-compassion, secure attachment, gladness, awe, serenity)

- **Attitudes** (e.g., openness, determination, optimism, confidence, approach orientation, tolerance, self-respect)

- **Somatic inclinations** (e.g., vitality, relaxation, grit, helpfulness)

- **Virtues** (e.g., wisdom, patience, energy, generosity, restraint)
Inner Strengths Are Built From Brain Structure
Growing Inner Strengths

Inner strengths are grown mainly from positive mental states that are turned into positive neural traits.

Change in neural structure and function (learning, memory) involves activation and installation.

We grow inner strengths by internalizing positive experiences of them and their related factors.
Without this installation, there is no change in the brain - no useful learning, no healing, no growth.

Positive activation without installation is pleasant, but has no lasting value.

Meanwhile, negative mental states are being preferentially installed into neural structure.
The Brain’s Negativity Bias

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

- Negative stimuli:
  - More attention and processing
  - Greater motivational focus: loss aversion

- Preferential encoding in implicit memory:
  - We learn faster from pain than pleasure.
  - Negative interactions: more impactful than positive
  - Easy to create learned helplessness, hard to undo
  - Rapid sensitization to negative through cortisol
Stone age brains in the 21st century
The Negativity Bias
Just **having** positive experiences is not enough.

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

This is the fundamental weakness in most psychotherapy, human resources training, and spiritual practices.
The same research that proves therapy works shows no improvement in outcomes over the last 30 or so years.

Scott Miller
We can deliberately use the mind to change the brain for the better.
Taking in the Good
Learning to Take in the Good
Have a Good Experience
Enrich It
“Enriching” Factors

- Duration
- Intensity
- Multimodality – perception, emotion, desire, action
- Novelty
- Personal relevance
Absorb It
Link Positive and Negative Material
HEAL by Taking in the Good

1. **Have** a positive experience. Notice it or create it.

2. **Enrich** the experience through duration, intensity, multimodality, novelty, personal relevance.

3. **Absorb** the experience by intending and sensing that it is sinking into you as you sink into it.

4. **Link** positive and negative material. [optional]
Have It, Enjoy It
Let’s Try It

- Taking in the good of **compassion**
  - Have the experience - bring to mind someone you care about . . . Feel caring . . . Wish that he or she not suffer . . . Open to compassion
  
  - Enrich it
  
  - Absorb it
It’s Good to Take in the Good

- Development of specific inner strengths
  - General - resilience, positive mood, feeling loved
  - “Antidote experiences” – Healing wounds, filling deficits

- Implicit benefits:
  - Shows that there is still good in the world
  - Being active rather than passive
  - Treating yourself kindly, like you matter
  - Training of attention and executive functions

- Sensitizes brain to positive: like Velcro for good
Research on the HEAL Process

- With collaborators from the University of California, a 2013 study on the HEAL course, using a randomized waitlist control group design (46 subjects).

- Course participants, compared to the control group, reported more Contentment, Self-Esteem, Satisfaction with Life, Savoring, and Gratitude.

- After the course and at two month follow-up, pooled participants reported more Love, Compassion, Self-Compassion, Mindfulness, Self-Control, Positive Rumination, Joy, Amusement, Awe, and Happiness, and less Anxiety and Depressed Mood.
Self-Esteem

![Graph showing self-esteem scores over time](image)

**Mean Score**

- **Pre-Course**
- **Post-Course**
- **2-Months Later**

**Legend**
- TGC
- Wait-list
**Combined Sample: Depression (BDI) & Anxiety (BAI)**

![Graph showing changes in mean scores over time for Depression (BDI) and Anxiety (BAI)]
Evolutionary History

The Triune Brain

The Triune Brain (P. MacLean 1990)
Some Types of Resource Experiences

**Avoiding Harms**
- Feeling basically alright right now
- Feeling protected, strong, safe, at peace
- The sense that awareness itself is untroubled

**Approaching Rewards**
- Feeling basically full, the enoughness in this moment as it is
- Feeling pleasured, glad, grateful, satisfied
- Therapeutic, spiritual, or existential realizations

**Attaching to Others**
- Feeling basically connected
- Feeling included, seen, liked, appreciated, loved
- Feeling compassionate, kind, generous, loving
Pet the Lizard
Feed the Mouse
Hug the Monkey
Cultivation Undoes Craving

- Taking in the good is an openness to experience while letting go of it.

- Much suffering and harm comes from “craving” – resisting unpleasant, grasping pleasant, or clinging to heartfelt – based on a deficit or disturbance of core needs (safety, satisfaction, connection).

- By repeatedly internalizing the felt sense of core needs being met, we reduce the sense of deficit or disturbance, and rest increasingly in a peace, happiness, and love that is independent of external conditions.

- With time, even the practice of cultivation falls away - like a raft that is no longer needed once we reach the farther shore.
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.

Dhammapada 9.122
Suggested Books

See www.RickHanson.net for other suggestions.

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


Where to Find Rick Hanson Online

Hardwiring Happiness: The New Brain Science of Contentment, Calm, and Confidence

www.rickhanson.net/hardwiringhappiness

Personal website: www.rickhanson.net

Wellspring Institute: www.wisebrain.org

youtube.com/drrhanson facebook.com/rickhansonphd