

Seven Facts about the Brain That Incline the Mind to Joy

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#1 The mind and the brain are mainly (and perhaps entirely) a single unified system.

Almost every – and perhaps every – subjective state is correlated with an objective, material brain state.

Other than a transcendental factor – call it God, Spirit, Energy, or by whatever name – by definition, what else could be going on than the functioning of *matter*?

I happen to believe there is indeed a mysterious transcendental Something infusing objective and subjective reality, whose influence is subtle, profound, and full of grace. Nonetheless, it is clear to me and most neuroscientists that most if not all of our thoughts and feelings, darkest passions and loftiest dreams, poetry and imagery, chess gambits and baseball statistics and recipes and quilt patterns and earliest memories of snow – and all the other textures and aromas and shades of being alive – require and consist of neurological activity.

Think of it this way: everything we are aware of, including our own sense of self, has a one-to-one correspondence with underlying, physical, brain structures and processes.

Just like a letter to friend or a picture of a sunset on your computer requires and represents an underlying pattern of magnetic charges on your hard drive.

First, this means that, as your experience changes, your brain changes. It changes both temporarily, millisecond by millisecond, *AND* - as we will discuss in a moment - it changes in lasting ways. For example, as just a sampling, researchers have found that:

- Different mental activities change brainwave patterns.
- People who meditate have more of the vital neurotransmitter, serotonin.
- The brains of pianists are thicker in the areas of fine motor function.
- The brains of meditators are thicker in the regions engaged with sensory awareness and with the control of attention.
- The brains of taxi drivers in London are thicker in the regions that are key to visual-spatial memories.

- Traumatic experiences shrink the part of the brain responsible for storing new memories.
- Repeated episodes of depression create marked changes in the brain that make a person more vulnerable to depression in the future.

Second, as your brain changes, your experience changes. For example, as most of us have experienced in everyday life, caffeine makes you feel stimulated and alert while alcohol makes you feel relaxed and even sleepy. A little more exotically, studies have found that:

- Activating the left frontal regions leads to a sunnier outlook and more positive mood – while strokes in those areas leave patients particularly irritable and depressed.
- Surges of the neurotransmitter, dopamine, feel very pleasurable (and why dopamine is associated with addictions).
- Damage to a cubic centimeter or so of tissue in a particular place on the left side of your brain can leave you able to understand language but incapable of generating it, while damage just a few centimeters away will have the opposite effect.
- Electrically stimulating portions of the brain can trigger memories or even out of body experiences.

And this research is mainly less than 20 years old. Consider how the invention of the microscope in the early 1600s opened up an entire new world in its revelation of all the “tiny beasties” found in a tear drop or a bit of pond water. Yet it still took 400 years to develop the modern understanding of molecular biology and evolution, which has established clearly that life involves and consists of structures and processes of *matter*.

Comparable technologies for peering into the brain have been around for only a few decades, so just imagine what will be understood 400 years from now . . . or even 40.

This intimate intertwining of mind and matter, psyche and soma, self and brain, may seem off-putting and reductionistic at first; to put it a little graphically: “What do you mean? I’m just the *meat*?!”

Yet for me, this understanding actually provokes an incredible sense of awe, as well as gratitude that we have inherited the results of 3.5 billion years of evolutionary refinement of the machinery underlying the mind. That appreciation takes one to a sense of responsibility to make the most of one’s life, to not waste this incredible, jaw-dropping gift of human consciousness.

And this understanding of the oneness of mind and brain spotlights a fantastic opportunity for well-being, psychological growth, and contemplative depth: In hundreds of ways, large and small, you can use your mind to change your brain to benefit your mind.

#2 “Neurons that fire together, wire together.”

This famous saying, from the psychologist, Donald Hebb, refers to the fact that the activation of a particular neuronal circuit increases the strength of connections within that circuit.

That strengthening happens both during tiny time intervals – through ephemeral electrochemical changes – and over longer periods as physically observable changes occur in the brain, notably:

- Increased synaptic connections among neurons (synapses are the junctions between neurons: tiny gaps full of a rich soup of neurotransmitters that function like microscopic switches, on/off)
- Increased thickening of the glial cells, the “scaffolding” tissues that support neurons
- Greater density of blood vessels bringing oxygen, glucose, etc. to neurons

#3 Fleeting experiences leave lasting traces in the brain.

Since the mind and brain are one, the flow of information in the mind entails a corresponding flow of electrochemical activation through the neuronal circuitry of the brain. In other words, the fleeting “stream of consciousness” leaves behind lasting marks on your brain, much like a spring shower leaves a trail of little gullies on a hillside.

For example, recall the studies mentioned above that refer to changes in the brains of pianists, meditators, victims of trauma, and cab drivers.

This means that your experiences are important not just because of their brief effects on your momentary, subjective quality of life, but also because they produce enduring changes in the physical structures of your brain. And these affect your well-being, functioning, and sometimes your physical health for days and decades to come. Which of course affects others besides yourself.

#4 Most changes in the tissues of the brain are in implicit memory.

There are two kinds of memory: Explicit and Implicit.

Explicit: Recollections of specific events.

Implicit: Emotions, body sensations, relationship paradigms, sense of the world

Implicit memory is different from remembering ideas or concepts: this kind of memory is in your "gut." It's visceral, felt, powerful, and rooted in the fundamental and ancient – reptile and early mammal – structures of your brain. The inner atmosphere of your mind – what living feels like – depends greatly on what is stored in your implicit memory.

In a basic sense, we are what we (implicitly) *remember* – the slowly accumulating registration of lived experience. That's what we have "taken in" to become a part of ourselves. Just as food becomes woven into the body, memory becomes woven into the self.

#5 Unfortunately, the brain emphasizes negative experiences.

It's the negative experiences that signal the greatest threats to survival. So our ancient ancestors that lived to pass on their genes paid a *lot* of attention to negative experiences.

Consider 80 million years or so of mammal evolution, starting with little rodent-like creatures dodging dinosaurs to stay alive and have babies in a worldwide Jurassic Park. Constantly looking over their shoulders, alert to the slightest crackle of brush, quick to freeze or bolt or attack depending on the situation. Just like any rabbit or squirrel you may have seen in the wild today. The quick and the dead.

That same circuitry is loaded and fully operational in your brain as you drive through traffic, argue with your mate, hear an odd noise in the night, or see in your mailbox an unexpected letter from the IRS.

First, the amygdala – the switchboard that assigns a feeling tone to the stimuli flowing through the brain (pleasant, unpleasant, and neutral) and directs a response (approach, avoid, move on) – is neurologically primed to label experiences as frightening and negative. In other words, it's built to *look* for the bad. For example, when someone gives you feedback – a parent, friend, lover, or boss – doesn't your mind go to the hint of criticism surrounded by praise? (Mine sure does.)

Second, when an event is flagged as negative, the amygdala-hippocampus circuitry immediately stores it for future reference. Then it compares current events to the record of old painful ones, and if there are any similarities, alarm bells start ringing. Once burned, twice shy. Your brain doesn't just go looking for what's negative; it's built to grab that information and never let go. (If you are interested in more information on this subject, you could look at the work of Richard Davidson and others on the limbic system, or the growing literature on trauma.)

Yes, we can notice positive experiences and remember them. But unless you're having a million dollar moment, the brain circuitry for what's positive is like a paper-and-pencil pad compared to a high-powered video camera plugged into a fast computer with terabyte storage for what's negative. When you look back at night on a typical day, what do you usually reflect on: the dozens of mildly pleasant moments, or the one that was awkward or worrisome? When you look back on your life, what do you muse about: the ten thousand pleasures and accomplishments, or the handful of losses and failures?

Third, the negative generally trumps the positive: A single bad event with a dog is more memorable than 1000 good times. Speaking of dogs, you may know of the studies on learned helplessness from Martin Seligman and his colleagues, which illustrate this point in haunting ways: it took only a short time to induce a sense of helplessness in the dogs, whose brain circuitry for emotional memory is very similar to our own. But it took an extraordinary effort to get them to unlearn that training. It's as if we are predisposed to believe the worst about the world and ourselves, and to doubt the best.

Fourth, your own personal training in the negative – whatever it's been – shapes your view of the world and yourself, and your personality and interpersonal style and approach to life. (In the extreme, such as with a serious history of trauma or depression, the hippocampus can actually shrink 10-20%, impairing the brain's capacity to remember positive experiences.)

All that can lead to more of the negative showing up on your radar – either because you are scanning for it preferentially or unwittingly increasing the odds of it coming your way. Which, in a vicious cycle, can make you even more inclined to see or cause the negative in the future. Even though the actual facts are that the vast majority of the events and experiences in your life are neutral or positive! Every day, the minds of most people render verdicts about their character, their life, and their future possibilities that are profoundly unfair.

What to do about this?

#6 You can help emphasize and store positive experiences through conscious attention.

As you know from school – and corroborated by hundreds of studies – you remember something best when you make it as vivid as possible and then give it heightened attention over an extended period.

That's exactly how to register positive experiences in your implicit memory. Which will slowly but surely change the interior landscape of your mind.

Three simple steps:

(1) Help positive events become positive experiences.

You can do this by:

- Paying attention to the good things in your world, and inside yourself. So often, good events roll by our eyes without us noticing them.

You could set a goal each day to actively look for beauty in your world, or signs of caring for you by others, or good qualities within yourself, etc.

- Deciding to let yourself feel pleasure and be happy, rather than feel ascetic or guilty about enjoying life. In particular, release any resistance for feeling good *about yourself*.

You've earned the good times: the meal is set before you, it's already paid for, and you might as well dig in!

You are just being fair, seeing the truth of things. You are not being vain or arrogant - which distort the truth of things.

- Opening up to the emotional and sensate aspects of your responses to positive events, since that is the pathway to experiencing things.
- Sometimes doing things deliberately to create positive experiences for yourself. For example, you could take on a challenge, or do something nice for others, or bring to mind feelings of compassion and caring, or call up the sense or memory of feeling contented, peaceful, and happy.

(2) Extend the experience in *time* and *space*:

- Keep your attention on it so it lingers; don't just jump onto something else.

Notice any discomfort with staying with feeling good.

- Let it fill your body with positive sensations and emotions. (That's the space part.)

In sum, savor, relish the positive experience. It's delicious!

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

Perhaps imagine that it's sinking into your chest and back and brainstem. Maybe imagine a treasure chest in your heart.

Take the time to do this: 5 or 10 or 20 seconds. Keep relaxing your body and absorbing the positive experience.

#7 Positive experiences have many important benefits.

In general

- Emotions organize the mind as whole, so positive feelings have global effects.
- They lower the stress response in your body by dampening the arousal of the sympathetic nervous system (the “fight or flight” wing) and by activating the parasympathetic nervous system (relaxed and contented). For example, positive feelings reduce the impact of stress on your cardiovascular system.
- They increase psychological resilience.
- They lift mood and protect against depression.
- They promote optimism – another bulwark against depression.
- Over time, they help counter-act the effects of trauma or other painful experiences. When you remember something painful from your past, your brain first reconstructs that memory – including its emotional associations – from a few key elements, and then it reconstitutes it in storage *with tinges of your state of mind at the time you recalled it*. This means that if you recall an event repeatedly with a dour, glum cast of mind, then your recollection of it will be increasingly shaded negatively. Alternately, you recall it repeatedly with a realistically upbeat state of being, then it will gradually come to mind more and more with a more neutral quality: you will not forget the facts of whatever happened, but their emotional charge will slowly fade – and that can be a great relief.
- They highlight key states of mind so you can find your way back to them in the future. So you can more readily tap into peace, contentment, feeling strong, well-being, lovingkindness, etc.
- They reward you for doing something that's noble but not always easy, and thus support your ongoing motivation.

For children

- All of the benefits above apply to kids as well.
- In particular, children who are in the spirited range of temperament really benefit from deliberately slowing down to take in positive experiences, since they tend to move along quickly to the next thing before the previous good feelings have had a chance to consolidate in the brain.
- Similarly, children in the anxious/rigid range of temperament also benefit from consciously soaking in good feelings, since they tend to ignore or downplay the evidence for those positive experiences.

For contemplative practice

- They promote steadiness of mind, necessary for any fruitful meditation.
- They support the deep states of absorption that are both blissful and profoundly insightful. For example, the high levels of dopamine associated with joy help keep the “gate” of awareness shut to being flooded by new experience, and thus support concentration.
- They build confidence in the fruits of one’s efforts. Conviction is a major engine of practice and perseverance; for example, in Buddhism, it is one of the factors of enlightenment.
- Fundamentally, you are cultivating wholesome qualities in your mind and heart, and both crowding out and replacing negative ones.

Conclusion

The innate neurological circuitry of your mind poses a very real challenge: positive stimuli tend to roll through it while negative stimuli get flagged and captured and deferred to. But you can consciously override those tendencies in simple and effective ways each day, by focusing on positive experiences, valuing them, and helping them sink in.

That’s a deeply wise and wonderful undertaking: happiness is skillful means. And happily for happiness, this is aligned with your deepest nature: awake, interested, benign, at peace, and quietly inclined to joy.