

The Wise Brain Bulletin

News and Tools for Happiness, Love, and Wisdom

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Featured Article:

The Brain: So What? The Benefits and Pitfalls of Applying Neuroscience to Psychotherapy

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The human brain is certainly interesting in its own right. Some of its key numbers are mind-boggling:

- One hundred billion neurons amidst another trillion support cells
- Just 2-3% of bodyweight, but consuming 20-25% of the oxygen and glucose circulating in your blood
- A typical neuron has connections, synapses, with another 5000 neurons, so there are about 500 trillion synapses in the brain
- Neurons fire 1 – 50 times a second, and sometimes faster; millions of neurons routinely form networks and fire rhythmically with each other dozens of times a second.
- During a single breath, a quadrillion or more neural signals traveled inside your head.
- The number of possible combinations of 100 billion neurons firing or not – which is, in principle, the quantity of potential brain states – is about ten to the millionth power. That's a 1 followed by a million zeros. To put this in perspective, the number of particles in the

universe is estimated to be “merely” 1 followed by eighty zeros.

Additionally, the recent explosion in knowledge about the brain – which is estimated to have roughly doubled in just the past twenty years – also offers many practical possibilities, including relieving distress and dysfunction, improving well-being, and deepening religious or spiritual practice.

Inside the Black Box

Throughout the ages, people have known that mental activities can lead to mental results. For example, looking closely at the landmarks around a watering hole in the Serengeti helped them remember its location later. More recently, it's been understood that talking through a painful situation with a supportive psychotherapist can help a person feel better.

Greetings

The Wise Brain Bulletin offers skillful means from brain science and contemplative practice – to nurture your brain for the benefit of yourself and everyone you touch.

The Bulletin is offered freely, and you are welcome to share it with others. Past issues are posted at www.wisebrain.org/bulletin.html

Rick Hanson, PhD edits the Bulletin, and it's designed and laid out by Michelle Keane.

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But what has not been known is the mechanism of action whereby mental activities produce mental results. Even during most of the past hundred years or so, when it was presumed within science that mental activities must correlate with neural activities, it was unclear how mental activities produced mental results via the “black box” of the brain.

All that is changing, and changing fast. Every month, new studies are showing how specific

neural structures and activities underlie particular types of thoughts, feelings, desires, and memories. Consequently, it is increasingly clear how to use targeted mental activity to stimulate the neural networks that are the physical basis of positive mind states and resources; we're learning how to reach down into the brain with growing specificity, dexterity, and power. And since neurons that fire together, wire together (the saying from the work of the psychologist, Donald Hebb), stimulating neural networks *strengthens* them – even making them measurably thicker, as can be seen in studies of taxi drivers, pianists, and meditators. The mind itself is the greatest sculptor of the brain.

Of course, we are just at the beginning of a great age of discovery about the human brain, somewhat comparable to the great discoveries in biology and medicine over the past several hundred years. Personally, I think neuroscience today is roughly where biology was about a hundred years after the

invention of the microscope – that is, around 1725.

That said, the potential of these new discoveries has galvanized many therapists, as well as schoolteachers, business consultants, health educators, and a number of spiritual teachers. In the field of psychotherapy, for instance, neurological perspectives have been incorporated into a number of specific treatments, including for trauma, obsessive-compulsive disorder, addictions, stress, attachment issues, and anger.



Figure 1

The Intersection of Three Disciplines

A Natural Rhythm

There is a natural rhythm in any field when a new and exciting perspective comes along. In our own field, we've seen it with psychoanalysis, behaviorism, humanistic psychology, family systems theory, and now brain science. At first there is skepticism, even resistance. Next comes the growing sense that there really is gold in those hills, and the rush is on, bringing fresh ideas and methods. And then, after awhile, it's time to step back and reflect on what is actually gold and what merely glitters, and where new veins of rich ore might lie.

In other words, when does brain science actually add value to psychotherapy? Alternately, when

does neuroscience get used in an effort to turn the unnervingly but inherently intangible and messy nature of mental life into something reassuringly concrete and mechanistic? Or a way to claim the authority of hard science in a field that has historically searched for respect? When is a familiar psychological process described neurologically little more than old wine in a new bottle?

Let's start with four contributions of brain science to the theory and practice of psychotherapy. Then we'll consider some potential pitfalls.

Improving Client Motivation

You may have heard this one already:

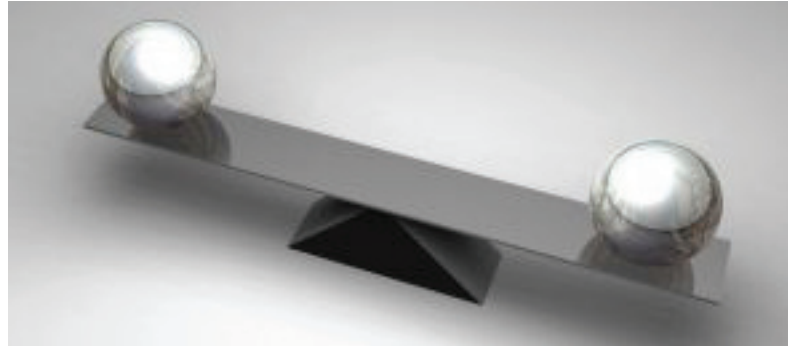
Question: How many therapists does it take to change a lightbulb?

Answer: Only one. But the lightbulb has to *want* to change.

The joke is silly, but also insightful. Every therapist has had clients who understood their problems intellectually but wouldn't do much about them, as well as other clients who worked hard to feel and function better. In each case, the X factor was motivation – and brain science offers a variety of ways to support it.

For example, in the past I would encourage some clients to practice relaxation techniques, often with limited success. But now I routinely describe how the sympathetic and parasympathetic nervous systems interact with each other like a seesaw – when one rises up it pushes the other one down – so raising parasympathetic activation through methods such as long exhalations lowers fight-or-flight sympathetic arousal. When I do this, I sometimes see a client's eyes snap into focus. We're no longer talking about something intangible like

relaxation; my "prescription" is now as concrete as a bottle of Xanax, and many more clients are beginning to take it. A physical mechanism of action – such as parasympathetic activation – often seems more "real" and significant than a mental one.

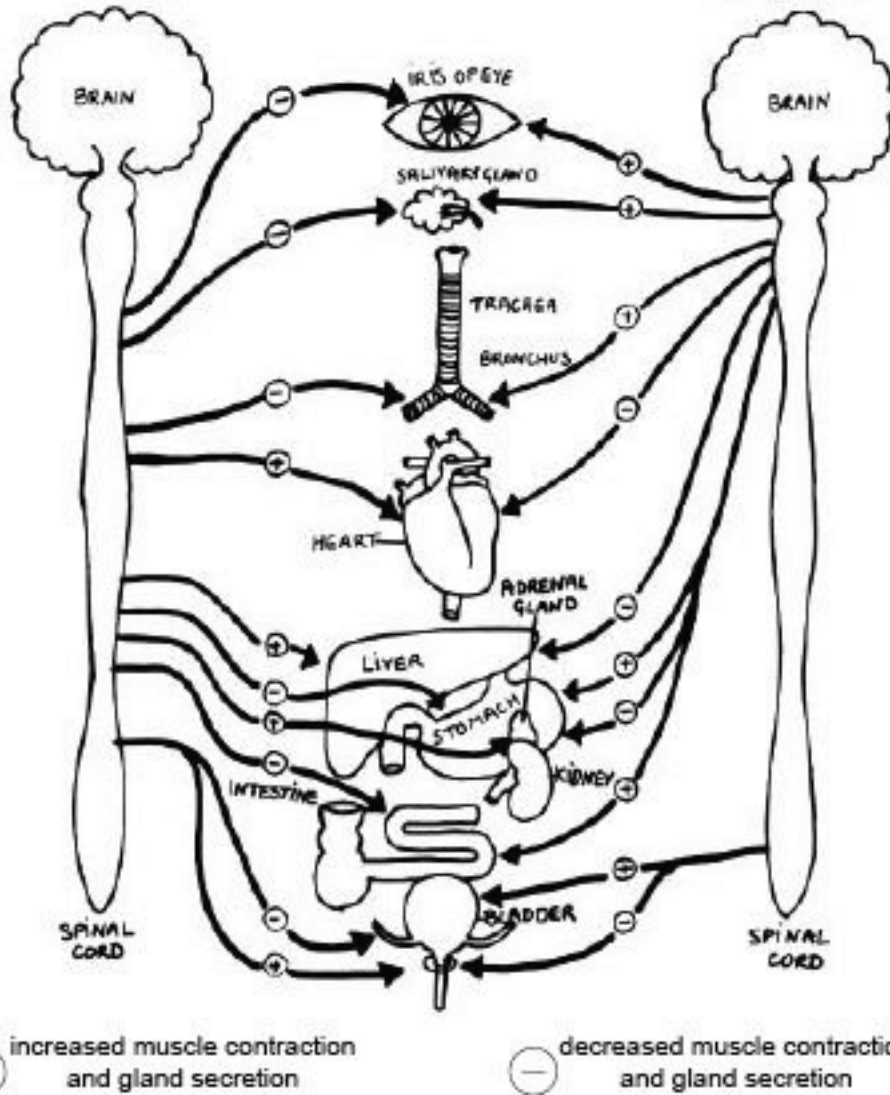


This is particularly useful with certain types of clients. For instance, in the common situation – at least in my own practice – in which a man is relatively skeptical about psychotherapy, being able to say something about the neural mechanics of things like childhood learning embedded in implicit memory stores makes it all more down-to-earth, plausible, and manageable. Similarly, I've found that children and teenagers who are disconnected from or resistant to therapy are usually interested in hearing about their brain (sometimes with schematic pictures sketched on my note pad) – and then often captivated by the idea of making positive changes in it.

Translating psychological issues into neural terms can also normalize and de-stigmatize them, and thus make it easier to come to grips with them. One man I saw felt ashamed about how hard it was to speak up for himself at work. He'd been raised in a very authoritarian family, in which the children were punished harshly for saying what they felt or wanted. So one day I explained that fear-based learning (e.g., don't talk or you'll get hit) in the amygdala resisted change; in effect, the tracks of negative experiences were laid down in sunbaked adobe while the tracks of positive ones were more

like lines in the sand. No wonder it felt like a muzzle was clamped over his mouth whenever he thought about asking his boss for a raise. In this context, he became much less embarrassed about his meekness at work and reluctant to bring it out into the open with me, and more focused on – as he put it – “rewiring this crazy circuitry.”

For our clients, it’s motivating to realize that the efforts they make can leave lasting traces in the tissues of their brain; for example, as Richard Davidson has shown, practicing mindfulness is associated with heightened activation in left prefrontal regions, and increases in positive emotion. Personal growth may seem immaterial at first, but it’s actually as real as the brain itself.



And it’s not just clients who get motivated by neuroscience. The new studies showing how treatments such as psychotherapy for obsessive-compulsive disorder can change the brain are heartening for therapists, too, who may sometimes feel that Freud was right about this being an “impossible profession.” Further, as a practical matter, neural evidence for the benefits of psychotherapy could help motivate policymakers and insurance companies to give it more support.

Providing a Unifying Framework

Imagine a time-lapse movie of a jungle growing, with vines sprouting and shooting off in all directions. That’s a pretty good picture of the last hundred years in psychotherapy: a tangled proliferation of theories, diagnoses, and treatments. Each edition of

the Diagnostic and Statistical Manual of Mental Disorders (DSM) has identified more psychological conditions than the previous one, and the current

Image courtesy of [Ruth Lawson](#)

DSM-IV contains 265. Meanwhile, the number of psychotherapies has grown dramatically as well, with 154 listed in Wikipedia in the Fall of 2009.

Much as the periodic table in chemistry provided an organizing structure for the elements (and, by extension, the molecules that could be made from them), brain science has offered a way to place the great diversity of psychological conditions and treatments within a single, integrative framework. Within this frame, the dynamics of the mind are understood in terms of the structures and processes of the brain. For example:

- Why do people exposed repeatedly to a stressor become increasingly reactive to that stressor – and to stress in general? Because chronic releases of the stress hormone, cortisol, stimulates the amygdala, the alarm bell in the brain; cortisol also weakens the hippocampus, which inhibits the amygdala; in a vicious cycle, stress today makes the brain react even more intensely to stress tomorrow.
- Why are teenagers so impulsive? Because the development of the emotionally-focused limbic system in adolescence outpaces that of the logical prefrontal cortex.
- Why are some people drawn to high-risk behaviors? Because they have relatively few receptors for dopamine – a key neurotransmitter for reward and pleasure – so they need extra stimulation to feel satisfied.
- Why does it take so much work to get the positive learning of psychotherapy to “stick”? Because the brain preferentially stores and recalls negative experiences compared to positive ones.

To be sure, neural explanations are only partial answers to the questions above. Further, the linkages between mind and brain are *far* from fully understood, so the promise of a unifying neural framework is many decades – or even centuries –

away from being completely realized.

Nonetheless, neuroscience has given us a common tongue in the Babel-like world of psychotherapy. For instance, whether we describe our work with depression as helping the client grieve the lost part-object, dispute depressogenic thoughts, face existential fears of death, heal disruptions of empathic attunement in early childhood, or access their luminous core of being, it is reasonable to ask how each of these approaches affects the serotonin system in the brain. Similarly, brain science offers common metrics for evaluating efficacy, such as the difference a treatment modality makes in serotonin metabolism.

Highlighting Key Treatment Factors

Facing the diverse array of psychotherapeutic methods, a therapist reasonably asks, “What makes the most difference?” Neuroscience is beginning to offer an answer, and in my opinion, these are some examples:

- We privilege the contents of consciousness because they’re what we know. But most of the mind – defined broadly as the flow of information through the nervous system – is forever outside of awareness. In other words, most of the brain is engaged with unconscious aspects of the mind. So it’s vital to consider implicit learning, priming, response biases, and other unconscious factors.
- Broca’s and Wernicke’s areas – the neural regions dedicated to language – comprise a small portion of the brain as a whole. Similarly, verbal thought is a small fraction of the information moving through the brain, and usually just one of the multiple contents of consciousness at any moment. Therefore, it’s critically important

to address nonverbal processes, to ground psychotherapy in embodied experience, in sensation and emotion and imagery.

- Norepinephrine and dopamine promote synaptic formation, and thus the creation of new neural structures. Moderate arousal raises the levels of these neurotransmitters, and therefore promotes learning. Consequently, methods like humor, movement, role-playing, or just going for a walk can help clients realize and retain the lessons of therapy.



- The remarkable capacity of the brain to alter its own structure verifies the human potential for healing, well-being, and self-actualization. Since the nervous system is enormously plastic, with sufficient effort, skill, and time, a person really can do a *lot* to overcome the effects of trauma, a lousy childhood, or major misfortune. This fact underscores the importance of character – of grit, patience, self-honesty, and perseverance – in psychological growth.

- The mind is embedded in the nervous system, which intertwines with other bodily systems (e.g., immune, endocrine); the body and mind are further embedded in larger systems of culture and nature, shaping them and being shaped in turn. Thinking about the mind in light of the brain leads you quickly into biology, evolution, and the brain-sculpting experiences that occur in the relationships of the most social animal on the planet. To paraphrase the title of Evan Thompson's brilliant book, the mind emerges *in* life. Therefore, any good account of the mind, and the most fruitful sorts of help for it, must necessarily be systemic.

None of the themes above is brand-new. But what is novel is the focus and emphasis that neuroscience offers.

As T.S. Eliot wrote in *Little Gidding*:

*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.*

Producing New Approaches

As researchers establish the links between mind and brain with growing precision, the neural correlates of both positive and negative mental states are becoming clearer. Then the question becomes how to activate the neural substrate of positive mental states, and inhibit the neural substrate of negative ones.

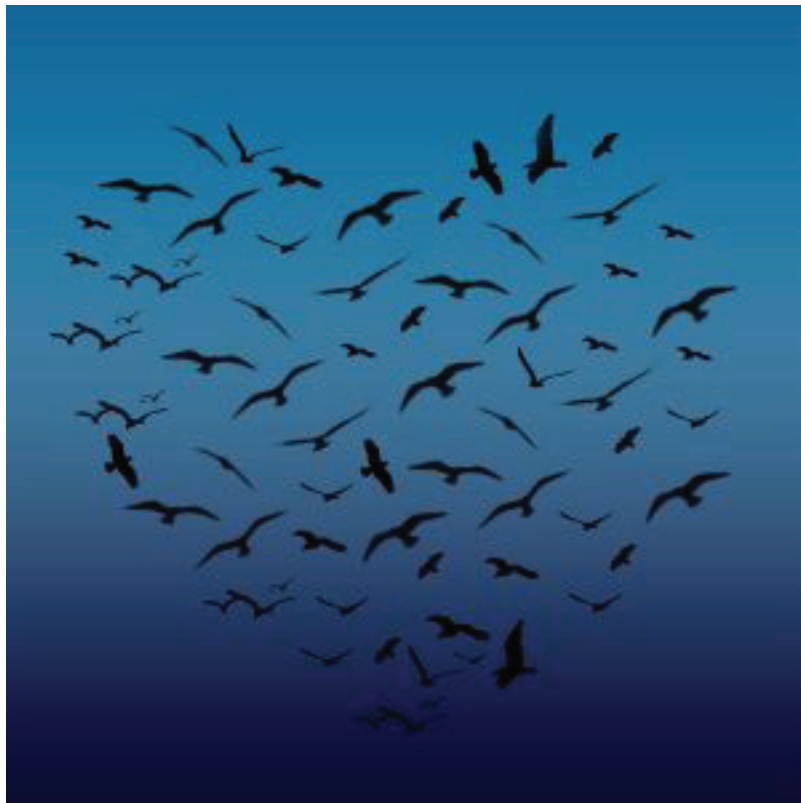
The obvious way to affect a physical organ – the brain – is through equally physical interventions, ranging from caffeine and aspirin to Thorazine and neurosurgery. The other way is more subtle: through *mental* interventions. Mental activity changes neural activity, and neural activity leads to changes in neural structure: *Neurons that fire together, wire together.*

Therefore, a person can use her mind to change her brain to change her mind. The therapeutic application of this general principle involves reverse engineering, in three steps:

1. Pick a mental state of interest (let's say it's a positive one such as empathy).
2. Find the neural structures and processes with which it's associated.
3. Identify or develop mental activities that stimulate and thus strengthen those neural circuits (or do the opposite if the mental state is a negative

one).

In some cases this investigation leads to new psychotherapeutic approaches, either using familiar methods for different ends, or identifying novel mental activities that produce therapeutic results



For example, integrating thinking and feeling is a desirable mental state (step #1), but many people have a hard time reasoning clearly when they're upset, or bringing emotion into conceptual activities like planning. Researchers have recently found that the anterior cingulate cortex (ACC) is very involved with weaving thought and feeling together (step #2). They've also shown that the conscious control of attention is centered in the ACC, which is measurably strengthened by activities that train attention such as meditation (step #3). In another example, studies have shown that tuning into the emotional states of others – a central component of empathy (step #1) – depends on the activity of the insula (step #2). The insula also handles interoception, the sensing of the

internal state of the body, so mental activities such as sensory awareness activate and eventually thicken the insula, and thereby increase empathy (step #3). In effect, investigators have found that a method used for one purpose (meditation, or sensory awareness) can stimulate and strengthen

brain regions that are also involved with another purpose (integrating thinking and feeling, or empathy).

Or consider neurofeedback, which is showing promise as a therapeutic modality. Let's say a therapist wanted to help a hyperactive child concentrate better (step #1), and that the neural states – indicated by particular brainwave patterns – that support good concentration are increasingly well identified (step #2). Then the therapist would help the child activate those neural states through finding mental activities that promote them, guided by neurofeedback (such as an image of a balloon

rising or falling) about their brainwaves (step #3). In the process of neurofeedback, it seems likely to me that at least some of the time, clients and therapists are discovering new ways to use the mind to foster positive brain states.

To date, there are not yet many examples of neuroscience findings leading to new therapeutic methods (or new applications for familiar ones). But as we learn more about the ultimate dark continent – the three pounds of tofu-like tissue between the ears – there is a growing opportunity to use targeted mental activities to change the brain. In principle, the potential of mental interventions for changing neural circuitry is much greater than that of physical ones, since the

range of activities the mind can perform is much greater than the number of chemicals the brain can tolerate. Further, skillful mental activities are not addictive, and they usually don't have side effects – unlike anxiolytics, antidepressants, psychostimulants, and antipsychotics.

Remarkably, anyone who wants to get to play in this game. Unlike medical research, which usually requires expensive equipment, applied neuropsychology is more like being a naturalist in the early 1800's: once a therapist learns some things about the "ecosystem" of the brain, he or she can go out and look around in every session of psychotherapy. Through tracking the connections between the mind and the brain, sometimes one can spot a new way to nurture a key brain state through targeted mental activity.

* * *

Next, while recognizing the contributions of neuroscience to psychotherapy, let's consider three potential pitfalls. I've stumbled myself into each one of them.

Over-Simplifying

With 500 trillion synapses and approximately 10 to millionth power potential states, the brain is the most complex object yet known to science, more complex than the earth's climate or the dynamics of an exploding star. Consequently, just about any significant mental function relies on a large and dynamic array of neural assemblies and processes. So it's usually a mistake to localize function to just one part of the brain. Yet we routinely hear things like: "Emotion comes from the limbic system. The right hemisphere holds the sense of the personal self existing across time. Mirror neurons make us empathic."

To use the last statement as an example, empathy is about much more than mirror neurons – which, for all the attention they've received, have not yet been clearly identified in the human brain. Mirror-like networks do resonate with the motor acts of others, and help us understand the intentions behind their actions. But perceptual-motor mirroring is only one aspect of empathy. The other major components are emotional resonance – supported in large part by the insula – and "theory of mind," which is grounded in the prefrontal cortex. Based on these neural systems, empathy simulates the actions, emotions, and thoughts of others. Arguably, empathy for emotions and thoughts is more important than empathy for actions in both everyday relationships and psychotherapy.

In addition to over-localizing function, the tendency toward over-simplification shows up in catchy yet exaggerated language, with examples such as these:

- We've got a God-gene.
- The brain is like Velcro for negative experiences but Teflon for positive ones. (This one's from me.)
- A caveman, monkey, and lizard have a tug-of-war inside my head.
- He's got a male brain, she's got a female brain.

There's certainly a place for a vivid phrase. The problem arises when we – or the popular media – treat a short-hand expression as an accurate generalization. Using the last bullet point just above as an example, to paraphrase Barack Obama in his 2004 "red state, blue state" speech: there are no male brains, there are no female brains, there are only human brains. The similarities between the brains of a typical adult man and woman greatly outnumber their differences; even if a neural gender difference is found among adults, that does not mean it was present at birth and

thus innate, since environmental factors such as gender socialization shape the developing brain.

Perhaps the ultimate over-simplification is to reduce mind to matter alone. In addition to the thorny philosophical issues this raises, it puts our clients on a slippery slope in terms of moral responsibility. One time I was working with a man and his aging mother, things got heated, and he started swearing at her. After he calmed down and we could talk about what had just happened – which left his mom reeling and me shaken, too – he shrugged apologetically and said, “That was my lizard brain, it just took over. Sorry.”

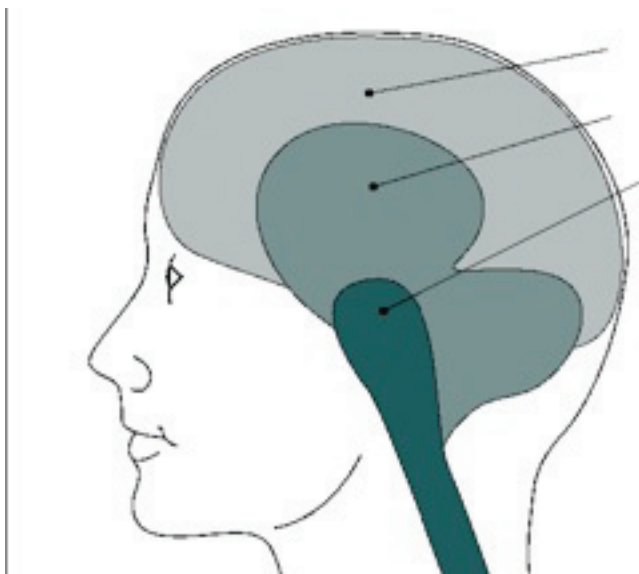


Figure 2
The Evolving Brain

Hmmm. “Lizard brain” gave him language for his sense of being grabbed by an overwhelming internal force, and that was helpful. But on the other hand, it offered a convenient excuse for yelling at his mother, and a powerful one at that, since it came wrapped in the mantle of pop science. What’s the logical extension of reducing depression to low serotonin, addiction to insufficient dopamine receptors, and angry outbursts to the lizard brain within us all? Teenagers who say they can’t do their homework

because their brains don’t produce enough acetylcholine? Men who say that emotional conversation is beyond them due to their “male brains?” Murderers who use brain-imaging studies to claim they’re incapable of moral reasoning because early trauma blunted them emotionally?

Claiming Authority

Like many therapists, I’ve struggled at times to help my clients understand themselves better. More than once, I’ve found myself saying something along these lines: “It’s your amygdala. It’s gotten sensitized to your spouse/boss/mother/father. So when you see that person, you get angry.”

My intentions are usually good – well, some of them. Mixed in with the desire to help a client make sense of his or her reactions can be dollops of glibness, self-doubt that a purely psychological interpretation would be enough, anxious discomfort with the complexities of the mind that clutches at simplistic explanations, and, honestly, some showing off. The brain has been the ultimate dark continent, so expressing knowledge about it is a powerful way to claim authority in discussions with clients – and with colleagues, the general public, or (I admit it) your own parents.

Sometimes that authority helps increase client motivation, one benefit of bringing neuroscience into psychotherapy noted at the beginning of this essay. But we need to be aware of the temptation of reaching for that authority simply because it feels good personally, particularly within the larger historical context in which therapists and psychologists have generally had lower cultural and academic standing than physicians and “hard” scientists.

Further, in reaching for that authority, we run the risk of actually undermining our own credibility by resorting to neurological accounts that add little or no informational or practical value. To use my own example just above, after I've said something about the brain, more than once I can see these words written on a client's face, and sometimes coming out of his or her mouth: "So what? How does knowing that help me?" Describing mental reactions – such as becoming increasingly angry with a person who keeps mistreating you in the same ways – in physical terms (i.e., your amygdala has gotten sensitized) often just replaces one set of descriptors with another one that adds no meaning other than the implicit message that there are underlying physical processes. And from a client's point of view, knowing that there is a physical basis for his or her reactions does not in itself offer any new or better ways to manage them. Do a little experiment the next time you read a neurological explanation for a psychological phenomenon: replace the neural terms with mental ones, and see whether the overall meaning is diminished, or if it is in fact enriched by the nuances of mental, rather than neural, language.

This issue of claiming authority shows up as well in the wider public sphere, outside of the confines of a therapist's office. While selectively focusing on scientific findings that validate one's values is not unique to mental health professionals, the brain is the headquarters of human nature, so neuroscience offers uniquely tempting trump cards in any discussion of policy or politics. For instance, research on the brain can be used to make a case for the inherently altruistic nature of much economic decision-making, the primacy of interactions with caregivers on a child's developing brain, and the hard-wired automaticity of empathy. But neuroscientific trump cards can

be played in more than one way, such as offering evidence for the inevitability of prejudice, the naturalness of pleasure at the misfortune of others we envy, and the central role of lethal aggression between hominid bands in driving the evolution of the brain. The more that neuroscience attains authority in our culture, the more important it is to be balanced and restrained in communicating about it.

Underestimating the Mind

Most fundamentally, we should not lose sight of the power and potential of the mind in our fascination with the brain. Big psychological changes typically involve tiny changes in the brain. For example, when someone has a revelatory insight into his or her childhood, or truly commits to stop using drugs, or finally works up the courage to say "I love you," there is undoubtedly a shift in some neural coalitions, but that change involves a minuscule alteration in the overall structure and activity of the brain. Most of the headlines about neuroplasticity deal with extreme cases, like stroke recovery. For people who've had a brain-related injury or illness, these dramatic findings are inspiring and useful. But they're not very relevant for people with normal-range brains. Since the normal brain can hold a vast range of thoughts – for example, as best we know, Hitler and Gandhi both had a normal brain – mental plasticity holds vastly greater opportunities for healing, well-being, and contribution to others than neural plasticity does.

If the brain is an enchanted loom – in the famous metaphor from the neuroscientist, Charles Sherrington – it's a loom that is capable of weaving an infinite variety of tapestries, whose patterns can never be reduced to the mechanics of

the loom itself. If we're interested in helping with the patterns of another person's life, or making our own more beautiful, we have to look past the loom to the weaver.

Over the past century, and before much was known about the brain, therapists have helped millions of people feel better, and lead more loving and productive lives. For example, I recently met with a mother trying to figure out whether to take a foster child – a teenage girl – into her home given the potential impacts on her teenage son and an already strained marriage. We talked about the love that led her to consider this step, her worries about her son, and some practical steps she could take. What I know about the brain did not help me think more clearly about her issues or respond more skillfully, nor was it a relevant topic to bring up with her. This would be true for most of my sessions each week, and I suspect it would also be true for most therapists.

Certainly, neuroscience has added value to clients, therapists, and our field as a whole. But in a decade or two, I think it will take its place as another valuable paradigm alongside other paradigms that have emerged in the history of psychotherapy, including: psychodynamics; behaviorism; humanistic and transpersonal psychology; social learning; family systems theory; and cognitive psychology. Brain science will be one more good thing to pay attention to, to think about, to learn from. But it will not become the defining framework of psychotherapy.

More fundamentally, regardless of what is discovered about the brain, at the end of the day each person still has to decide how to live his or her life. In philosophy, there's a fallacy called "from is to ought." In other words, a fact alone can never establish a value. One has to add

something to the fact – some principle, emotion, or goal – to arrive at what should happen. The fact is that the brain has a tremendous range of capacities that can be used for good or ill, and it has inclinations in both directions. Therefore, the crux is not the nature of the brain, but the values of the mind. To be viable for human beings, our values need to be guided by our nature; values like compassion make sense for social animals like us but not for lizards or sharks. But on the broad canvas given us by evolution, each person's mind paints in his or her ethics and aspirations as an existentially creative act.

Under the pressure of our culture's craving for a quick fix, and for simple and concrete explanations for complex psychological conditions, it is important to keep faith with the deep wisdom in our field, and within each one of us, about the mysteries and the possibilities of the mind – no matter what we learn about the brain.

Grateful Wonder

The Known Universe

There's just one link in this issue of the Bulletin, but it's a doozy: a scientifically-sound movie from the American Museum of Natural History that takes you from the Himalayan mountains all the way out to the faint "cosmic microwave background radiation" left over from the Big Bang. Strap on your seatbelts and enjoy the ride:

- <http://antwrp.gsfc.nasa.gov/apod/ap100120.html>

Perspectives on Self-Care

Be careful with all self-help methods (including those presented in this Bulletin), which are no substitute for working with a licensed healthcare practitioner. People vary, and what works for someone else may not be a good fit for you. When you try something, start slowly and carefully, and stop immediately if it feels bad or makes things worse.

Words of Wisdom

We are not human beings having a spiritual experience, we are spiritual beings having a human experience.

Teilhard de Chardin

Mountains' walking is just like human walking. Accordingly, do not doubt mountains' walking even though it does not look the same as human walking. You should penetrate these words. If you doubt mountains' walking, you do not know your own walking.

Dogen

Do not worry about what is there to come.
Do not cry about what goes by.
But worry - about losing yourself.
And cry - if you are floating down the stream of time without carrying heaven inside you.

Friedrich Schleiermacher

Do not depend on the hope of results. When you are doing the sort of work you have taken on, essentially an apostolic work, you may have to face the fact that your work will be apparently worthless and even achieve no result at all, if not perhaps results opposite to what you expect. As you get used to this idea, you start more and more to concentrate not on the results but on the value, the rightness, the truth of the work itself.

Thomas Merton

Men ought to know that from nothing else but the brain come joys, delights, laughter and sports, and sorrows, griefs, despondency, and lamentations. And by this, we acquire wisdom and knowledge, and see and hear, and know what are foul and what are fair, what are bad and what are good, what are sweet, and what unsavory.

And by the same organ we become mad and delirious, and fears and terrors assail us, some by night, and some by day, and dreams and untimely wanderings, and cares that are not suitable, and ignorance of present circumstances, and unskillfulness.

I am of the opinion that the brain exercises the greatest power in the man. It is the brain which is the messenger to the understanding.

Hippocrates

Fare Well

May you and all beings be happy, loving, and wise.

The Wellspring Institute for Neuroscience and Contemplative Wisdom

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