

The Power of Change: How Mind and Body Therapies Can Be Used Effectively in Counseling

Introduction

For over the last hundred years, neuroscientists have told us that the brain does not have plasticity, meaning that the brain lacks the ability to change and create new neural connections (i.e., it lacks “plasticity”). “Conventional wisdom in neuroscience held that the adult mammalian brain is fixed in two respects: no new neurons are born into it, and the functions of the structures that make it up are immutable...” (Begley 6). In other words, once we reach adulthood our brains are hardwired that way for the rest of our lives. This scientific dogma has been taught repeatedly ever since there has been a science of the brain (Begley 5-6). Thus, the immutability of the brain has come to be widely accepted by most modern neuroscientists and society. Evidence of this is seen in scientific research such as the Human Genome Project, which reflects theories that everything, from personality to emotions to psychological disorders to diseases, could be traced down to the neurological level.

Scientists have not completely failed to recognize that the brain undergoes some changes throughout life, because, after all, the brain is an organ of behavior, as well as learning and memory. Yet researchers have been very skeptical of wholesale changes in the brain, such as altering the wiring that connect one region to another (Begley 6). There is a convenience that accompanies this way of thinking. As neuroscientist Fred Gage explained,

If the brain was changeable, then we would change. And if the brain made wrong changes, then we would change incorrectly. It was easier to believe there were no changes. That way the individual would remain pretty much fixed. (Begley 7)

Assuming that the brain is fixed is convenient for research, yet this “doctrine...has had profound ramifications” (Begley 7). For example, it implies that trying to rewire the brain to undo pathological connections that underlie psychiatric diseases, such as obsessive-compulsive disorder (OCD) and depression, would be impossible.

To the contrary, in the last decade scientists have made discovery after discovery that challenge the paradigm that the adult brain can not change and have shown that the brain has remarkable powers of neuroplasticity (Begley 6). The revolution occurring in our understanding of the brain’s plasticity well into adulthood does not end with the fact that the brain can and does change, but also with how this change occurs. This hopeful new scientific research shows us that the “very structure of our brain—the relative size of different regions, the strength of connections between one area and another—reflects the lives we have led, [as well as] the...thoughts we have thought” (Begley 8-9). In the past, scientists have quoted the Spanish neuroanatomist, Santiago Ramón y Cajal, who stated that “nerve pathways are something fixed, ended, and immutable” (Begley 25). Yet Ramón y Cajal also said, “It is for the science of the future to change, if possible, this harsh decree.” As this paper will show, science has indeed changed it.

To summarize, the purpose of this paper is to demonstrate, through exploration of a series of experiments in the last century, that the scientific dogma is no longer tenable. In addition, I will explore the two-way street of causality between the brain and the mind, at first from a scientific view. Finally, I will explain the practical ramifications of the new scientific finding and the resulting applicability of mind and body therapies in counseling.

The Scientific Path to Proving Neuroplasticity

The initial discoveries that led to the revolution of our understanding of the brain were in what is now called use-dependent cortical reorganization (Begley 48). The earliest empirical evidence that habits both produce and reflect the structure of the brain was the experiments done by T. Graham Brown and Charles Sherrington in 1912. In their experiments, Brown and Sherrington carefully constructed movement maps of each monkey's entire motor cortex by taking tiny electrodes and zapping different points of the motor cortex, taking note of which muscles twitched. The scientists found that the movement maps were "...as individual as fingerprints" (Begley 28). Sherrington proposed that the variability in movement maps arises from the monkey's history of movement.

A logical flaw to this suggestion is that differences between a movement map of one animal and that of another were simply inborn. Yet in 1923, Karl Lashley dispelled this possible flaw of Brown and Sherrington's hypothesis. Lashley accomplished this by determining "the movement maps of the same rhesus monkey over the course of a month" (Begley 29). Lashley found that with each new movement map, there were slight differences and the differences became increasingly different from the maps derived longer ago. Thus, Lashley was able to infer that there is a "plasticity of neural function" that is reflected in the observation that habitual movements recruit more of the brain's real estate than movements that occur less frequently (Begley 30).

Perhaps the greatest example of use-dependent cortical reorganization is the case of the Silver Spring Monkeys. In 1977, Edward Taub recreated an experiment that was done in the early twentieth century by deafferenting two, one or none of the sensory nerves in the arms of seventeen macaques. Before Taub could complete his experiments with the monkeys, however, the monkeys were seized and relocated because Taub was charged with multiple charges of

animal cruelty (Begley 40-41). The significant discovery made by studying the Silver Spring Monkeys came eight years after they had been relocated. Neuroscientists Mortimer Mishkin and Tim Pons studied Billy, the only monkey with two deafferented arms, in late 1989. Mishkin and Pons wanted to see what the zone in the somatosensory cortex that originally would have registered sensations from Billy's arms was doing now. Since the "arms' zone" had not received sensory input for twelve years, one would expect that zone of the brain to be quiet. To the contrary, Mishkin and Pons found that the zone was very much alive with electrical activity. But it was not from the arm; the electrical activity came from touching Billy's face (Begley 43). This discovery proved that areas of the brain that are "hardwired" to do a certain function can be rewired to perform another function based upon the input the brain receives.

The question still remained, however, as to whether or not neurogenesis, the creation of new neurons, was possible. A series of fascinating experiments done by Fernando Nottebohm answered this call. Through studying canaries, song birds that change their mating song every spring, Nottebohm discovered that every year during spring the regions of the canaries' brains that generate melodies were up to ninety nine percent larger than in the fall. To further prove that this expansion was a result of new neurons, Nottebohm injected the canaries with radioactive thymidine, which would attach to newborn brain cells. After a month of injecting them daily, Nottebohm examined the canaries' brains and found that their brains had thousands of radioactively labeled cells, meaning that the adult canaries were making new neurons (Begley 54). Nottebohm's finding of neurogenesis was later further confirmed in the 1990s by Elizabeth Gould, who found that "neurons are born in the hippocampus of adult rats as well as New World primates" (Begley 55).

It was not until the 1990s that the process of neurogenesis was proven to be present in humans, too. Fred Gage's instrumental study used cancer patients who had been injected with BrdU, which was used with cancer patients because it marks every newborn cell. After examining five cancer patients' brains, Gage found that "all of the brains had evidence of new cells exactly in the area where we'd found neurogenesis in other species" (Begley 64). Gage's discovery was groundbreaking because it was the first evidence for neurogenesis in the adult brain and, significantly, the neurogenesis was occurring in people who were decades past when neurogenesis was supposed to cease in humans (Begley 65). As Gage said, "The finding brought us an important step closer to the possibility that we have more control over our own brain capacity than we ever thought possible."

By the 1990s, it had been scientifically verified that the human brain had a powerful propensity for neuroplasticity, as well as neurogenesis, which occurs daily. Yet what causes neurogenesis and are all "regions" of the brain equally plastic? Gage, in experimenting with mice, found that "physical activity alone can generate new brain cells," but the survival of the new cells relies on the level of environmental enrichment (Begley 66). Further experiments with the mice by Brian Christie found that there are "...structural reasons for enhanced learning and memory capacities we and others have observed in animals that exercise" (Begley 69). According to Christie, the experiments "lay the foundation for establishing exercise-induced changes in brain structure as a viable [way] to combat the deleterious effects of aging," as well as explain why leading an active life can be very beneficial in general (Begley 69).

In order to figure out what the most plastic regions of the brain are, a neuroscientist named Helen Neville ran a series of experiments with deaf and blind subjects. She found that the visual cortex and the auditory cortex can take on tasks usually performed by the other sensory

area, as well as nonsensory tasks such as language. For example, in blind people who know how to read Braille, the visual cortex is used in part for verbal memory and language. Yet in Esref Armagan, a blind artist who is illiterate, the visual cortex is used for the mental imagery he needs in order to paint. Thus the primary visual cortex can become “unbound from visual perception” (Begley 102). Yet Neville was quick to point out that through her research she had learned that neuroplasticity is not one sided. “Systems and structures that display the greatest plasticity are those under the weakest genetic control and most subject to the whims of experience and the environment” (Begley 102). While the higher plasticity of these regions have beneficial aspects, they are more susceptible during development and thus are at a higher risk in developmental disorders such as dyslexia (Begley 103).

While the plasticity of a human child’s brain was no longer questioned, it was uncertain how plastic adult brains are. One famous experiment done by Edward Taub showed the plasticity of the adult brain by studying musicians who play string instruments. The musicians, Taub theorized, should have a substantial difference in the brain space zoned for the fingering digits of the left hand, in comparison with the right. What was significant about the study, however, is that “the cortical area devoted to the fingering digits had expanded even in people who did not begin playing until they were adults” (Begley 127). Thus, Taub said, “even if you take up the violin at forty, you still get use-dependent cortical reorganization.”

It is important to note that neuroplasticity goes beyond cellular changes, and “produces wholesale changes in the job functions of particular areas of the brain” (Begley 129). Our brains are remade throughout life in response to our experiences and environment. Pascal Leone stated in 2005 “The potential of the adult brain to ‘reprogram’ itself might be much greater than has previously been assumed.” Yet the catch about this “reprogramming” is that it requires attention

to the input that causes it. In other words, “neuroplasticity occurs only when the mind is in a particular mental state, one marked by attention and focus” (Begley 130).

Thus the question is: what power does the mind have over the brain? Neuropsychiatrist Jeffrey Schwartz and colleague Lewis Baxter launched a study and treatment of OCD to find out. “In this neuropsychiatric disease, patients are barraged by upsetting, intrusive, unwanted thoughts (obsessions) that trigger intense urges to perform ritualistic behaviors (compulsions)” (Begley 137). Oddly, however, “sufferers describe feeling as if a hijacker has taken over their brain’s controls” (Begley 137). “Mindfulness practice, [Schwartz] thought, might make OCD patients aware of the true nature of their obsessions and therefore better able to focus their attention away from them” (Begley 139). After one week of mindfulness training, many of the participants in the study said that they no longer felt controlled by the disease, and that they felt they could do something about it. To find out whether or not the benefits that the patients were reporting were accompanied by brain changes, the scientists ran “PET scans on eighteen OCD patients before and after ten weeks of mindfulness-based therapy” (Begley 140). Schwartz and his colleagues’ study

...was the first...to show that cognitive-behavior therapy has the power to systematically change faulty brain chemistry in a well-identified brain circuit.

The ensuing brain changes offered strong evidence that willful, mindful effort can alter brain function, and that such self directed changes—neuroplasticity—are a genuine reality.” (Begley 143)

In essence, Schwartz’s study and mindfulness therapy proved that the mind can change the brain.

A similar experiment was done in 2000 by Teasdale, Segal, and Williams, which randomly assigned half of 145 patients to receive mindfulness-based cognitive therapy and half

to receive their usual care. They found that there was a “44 percent reduction in the risk of relapse among those who received mindfulness-based cognitive therapy compared to those receiving usual care” (Begley 147). Thus, mental training can cure depression and greatly reduce the rate of relapse (Begley 147). The effectiveness of mental training for reducing the rate of relapse was replicated in 2004 by Teasdale and Helen Ma (Begley 148). Therefore,

[t]he discoveries that mindfulness meditation can alter fundamental patterns of brain activity in people with depression or obsessive-compulsive disorder suggest that even rudimentary forms of mental training...can induce plastic changes in the brain. (Begley 229)

With the knowledge that the mind can change the brain, researchers sought to find out what long-term meditation can do to. More specifically, the neuroscientists wanted to focus on “mental traits, habits of thinking and feeling that are manifest when the brain is not meditating and that would presumably reflect an enduring physical or functional change in the circuitry of the brain rather than a fleeting burst of activity” (Begley 213). The researchers wanted to know: was there really such a thing as a “happiness set point,” or could we train ourselves to be happy? A landmark study of meditators, both adept meditators and novices, was done by Richie Davidson that proved that we can train ourselves to open our hearts and minds to others. Davidson found that “[d]uring the generation of pure compassion [facilitated by compassion meditation], the brains of all the subjects, both adept meditators and novices, showed activity in region responsible for monitoring one’s emotions, planning movements, and positive emotions such as happiness” (Begley 237).

In conclusion, “[w]e are not stuck with the brain we are born with but have the capacity to willfully direct which function will flower and which will wither, which moral capacities emerge and which do not, which emotions flourish and which are still” (Begley 241).

Current Counselor’s and Their Use of Meditation in Their Practice

My foundation for wanting to become a counselor stems from my belief that people possess a great capacity to change and control their cognitive processes, behavior and overall who they are as a person. And as explained above, scientifically it is proven that the majority of humanity has the power to not only change the way they think (their consciousness), but also change their brain at a physiological level. Counseling has a great capacity to help people become who they want to be and live the lives they want to live. More specifically though, the research described above suggests that regular mental practices, such as meditation, have a wonderful practicality for not only those who struggle with anxiety, OCD, or depression, but also for those who want to increase their sense of fulfillment and happiness in life.

Since I am not a counselor yet, however, it was hard for me to know for sure the extent of applicability that meditation could have in a counseling practice. Thus, I decided to interview two counselors in Knoxville area to find out what their experience with integrating meditation into their counseling practice has been like.

The first counselor I interviewed works at our Counseling Center on campus.* Since I have thought about becoming a counselor at a university, I was very interested to hear what he had to say about counseling college students and, in particular, how has he found meditation to be applicable. He said when working with students, one of best ways to counsel is through a

* Since the counselor seemed uneasy with being quoted in this paper, I decided that it would be best to keep his identity anonymous.

developmental approach. In other words, college is an important transitional period, physically and socially. The majority of students who come to the clinic are freshmen and sophomores. Most of their problems are not overly serious and are commonly related to stress, homesickness, sexual identity, self-confidence and family troubles.

Due to the increasing volume of students dealing with issues related to those problems just listed, the Counseling Center has started more short-term treatments under a new Stress and Wellness Clinic. The therapies range from semester-long classes in relaxation techniques such as mindfulness, as well as weekly workshops and short-term therapy (which is when the student only meets with a counselor a couple of times and the sessions are more spread out). This has helped prevent the Counseling Center staff from being spread too thin, and he said that it has greatly helped their ability to utilize their resources with the same number of staff.

The Stress and Wellness Clinic also provides students with a variety of options to meet their different needs, whether it be advice on how to get more sleep, how to deal with stress or anxiety, or even how to be more assertive. The workshops, classes, and short-term therapy allow students to “check in” with where they are and also provide tools for the students to help them develop ways to deal with whatever it is they are going through. While the counselor admitted that these programs were in the early stages, he felt that the Stress and Wellness Clinic provides the benefits most students who seek their services need with less intensive treatment. Time will tell whether these programs have a long-term impact on the college community.

When I asked him how applicable meditation was in his own counseling practice, he said he felt that it is very conducive for resolving many of the students’ issues. He stressed the importance of listening to the client to see how open they are about meditation. Some people, he explained, feel uncomfortable with that word because it can seem foreign to them and thus they

may not be open to trying it. In situations like that, he said he still can usually work in meditative qualities, such as developing self-awareness and learning to be nonjudgmental of themselves. He said these qualities are very useful for students trying to overcome depression and anxiety problems.

I really enjoyed the example he often uses to explain these qualities to a client who is not as open to meditation. He explains to them that in our society, we usually fall into three different roles, two of which are very familiar. The two that we are most familiar with are “mr(s). fix it,” who believes every time a conflict arises they must take action or the problem will not be resolved, and the “judge,” who is constantly analyzing and judging both themselves and others. The third role, however, is the “observer,” who has developed the ability to listen to their internal dialogue and is able to sit in hard situations and be comfortable. The counselor encourages the client to sit and listen to what they are feeling. If the client is feeling angry, he suggests that the client learn to say, “I am feeling angry. Isn’t that interesting.”

By facilitating the client to begin simply observing their internal dialogue (emotionally, mentally, and physically), instead of trying to do something about it right then or judging themselves for feeling the way they do, the client is learning meditative qualities that can help them learn to overcome the reason they are coming to counseling. In my own opinion, I think that it could also help the student develop a personal foundation that would support a stable and happy life. As the study showed in *Train Your Mind, Change Your Brain*, simply doing meditation or other cognitive therapies for a couple of weeks can have beneficial effects.

The other counselor I interviewed works at a local private practice here in Knoxville and her name is Shoray Kirk. Shoray also integrates some very basic meditation into her counseling practice, yet again it is based upon what the client needs and what they are open to. She told me

that sometimes it is difficult to approach people who are not open to meditation, whether it be because of the client's religion or simply because it is unfamiliar. There are several ways Shoray told me she helps clients overcome this fear of meditation. One is by telling the client about the science behind it, and how it is really a practice, not a religion.

This practice, she explains, is learning to sit with one's emotions and allowing oneself to simply become aware. These meditation concepts are different than other cognitive therapies because they usually focus on bringing forth what is within, whereas meditative therapy does not rush this process and instead allows for thoughts to come out naturally. Shoray said she encourages them to breathe deeply and to relax, emphasizing that those moments of silence can be good. She informed me that this process can be challenging for people to do at first because they are not used to these meditative concepts. Thus she tries to avoid alienating them by using the "language of the client." For example, if the client is Christian, she can use contemplative prayer in place of the word meditation.

In contrast to the counselor I spoke with at the Counseling Center, Shoray primarily does referrals for her clients who she thinks would benefit and are open to meditation and yoga. She told me that she is careful to recommend more than one place, however, because she wants the "where and when" to be the client's decision. When I asked Shoray how applicable she thought meditation and yoga were for counseling, she said it has great applicability for a wide host of problems, such as obsessive thoughts, self-defeating thoughts, OCD, anxiety, depression, and stress. As an example, she explained that if someone is depressed, meditation can help them learn to pay attention to moments when they are not depressed and can help their intense emotions to become more balanced, less extreme.

My Future in Counseling

Although it is hard for me to say for sure what my future in counseling will be like, I know that I want to incorporate mind and body therapies into my counseling practice. In particular, I feel there is a tremendous benefit to using this type of therapy with university students because college is such a transitional part of their life. The way I hope to accomplish this development in college students is by creating programs, like the Stress and Wellness Center, that would consist of classes, workshops and short-term therapies. I would like to base them on mindfulness practices, including, but not limited to, meditation, walking meditation, and yoga. If people can learn at a young age, that is, before they enter the workforce, how to deal with stress, depression, anxiety or relationship issues in a holistic way, then our society will be one that is more healthy, understanding, and compassionate. I feel that these programs will help people to get above the “normal level” of mental and emotional health. “As the Dalai Lama has written, there is an ‘art’ of happiness” (Begley 242). My hope with developing counseling programs that are based on mindfulness practices is that, as Sharon Begley says, “the ability to willfully change the brain will become a central part of our lives—and of our understanding of what it means to be human.”

Works Cited

Begley, Sharon. *Train Your Mind, Change Your Brain: How a New Science Reveals Our Extraordinary Potential to Transform Ourselves*. New York: Ballantine, 2007. Print.