Tapping And Modern Science
The Science Behind These Astonishing Results

by Dawson Church

Tapping is wonderful! I recommend it for everyone. In fact, since I discovered EFT and other forms of energy psychology, I've gradually moved from writing about them, to practicing them, and then to advocating them. I've also focused on building a solid foundation of research behind EFT, so that we can call it an "evidence-based" method. This isn't easy; doing a single scientific study is about as much work as building a house from scratch. It can also cost as much, in dollars and volunteer time, as your house might cost. And yet such is the enthusiasm for EFT, from thousands of people, that we've seen the number of EFT studies go from 2 to 20 in the past decade, with many more studies scheduled for publication in the coming years. We regularly update the research pages of the EFT Universe web site (www.EFTuniverse.com) as new papers are published. Our professional field now even has its own peer-reviewed journal, called *Energy Psychology: Theory, Research, and Treatment*, of which I was privileged to serve as founding editor (www.EnergyPsychologyJournal.com).

While studies report numerical data, those data represent positive changes in the lives of real people who are suffering. Working with war veterans has been particularly rewarding. We've seen miracle piled upon miracle as individuals and families have recovered from the effects of posttraumatic stress disorder (PTSD). Recently one EFT coach wrote me a note attached to her data sheet on which she recorded a veterans' enormous mental health improvement after 6 sessions of EFT. She wrote: "This man is an EFT believer! He and his wife tap on a regular basis, individually and together. It was his wife who first contacted me, as she was extremely worried about his deep anxiety and depression. He felt like EFT was a last resort; he was in such a dark place. After we finished working together, he compared the data from his intake forms to his final checklists, and he was blown away. A very grateful man."

There are now over 100 life coaches in the USA and over 25 in other countries who offer veterans free or low-cost EFT. They're listed on the web site of the Iraq Vets Stress Project, www.StressProject.org, and veterans and their families can use the site to get EFT over the phone if there's no one available in their geographic area. The Stress Project has also produced three scientific studies of EFT, and led to presentations of EFT to congressional committees in Washington DC. It also needs your help; you can have yourself listed as an EFT provider by entering your contact information on the site; and if you'd like to include the Stress Project in the charities you donate to, your money will help bring relief to many suffering people.

I've also been fascinated by the changes we've seen in people's physical health, as well as mental health, after EFT. In a landmark randomized controlled trial, we compared levels of cortisol, your body's main stress hormone, before and after EFT. A control group received regular psychotherapy, and a third group received no intervention at all. We found that those in the EFT group had much larger reductions in their cortisol levels than produced by either relaxation or talk therapy. This led to the design of a study to measure the degree to which stress genes are turned on or off after EFT; that study started recently, and will demonstrate whether or not EFT has an effect at the most basic level of molecular biology.

When Gary Craig, EFT's originator, wrote the first edition of The EFT Manual in the late 1990s, the only available evidence for how EFT works in the body came from the field of Oriental Medicine,

with its descriptions of energy flows, and treatments such as acupuncture and qi gong. The second edition of The EFT Manual, by way of contrast, now contains a new chapter on "The Science Behind EFT." Gary kindly invited me to write that chapter, and there is now so much scientific evidence for how EFT works that I had difficulty fitting it all in! For instance, in the past two decades, science has shown that the neural networks in our brains are forming new connections every second, and that emotions are particularly potent at determining how our brains are wired. You can read an abridgment of "The Science Behind EFT" chapter below.

The science of epigenetics has come of age; it has demonstrated that, far from being static blueprints, many of our genes are being turned on or off each day, each hour, and — in the case of stress genes — each second. This rapid gene firing makes sense if you reflect on how vital it is to our survival to have a quick response to threats. Yet while this biological threat-response machinery was fantastically useful to our Paleolithic ancestors who lived in an environment full of predators and physical danger, it is almost completely useless for modern humans. All it does is produces excess stress and worry. That's where EFT comes in. EFT is capable of shutting down the stress response quicker than any other method I've ever seen. And that shift helps your body repair itself, as the biological resources otherwise grabbed by the stress response are freed up for vital functions like the immune system and the cell repair system.

We also now know that there are "molecules of emotion," messenger molecules like dopamine and serotonin that help us feel peaceful and alert. When we're upset, we go into stress mode, and we disturb the optimal ratios of these neurotransmitters. EFT can help put them back in balance.

All these new scientific developments are described in the second edition of The EFT Manual, and I believe that the new manual will help launch EFT into renewed acceptance in the medical community. I'm also thrilled at the tens of thousands of newcomers who have been introduced to EFT by online initiatives like the EFT World Summit, and I hope to see millions more learning to tap out their stress and emotional trauma every year.

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1 – The Science Behind EFT

How Is EFT Able to Address Such a Wide Variety of Problems?—The Brain's Ability to Detect Threats—Brain Waves: Beta, Alpha, Theta, and Delta—Exposure, Cognitive Change, and Conditioned Responses—Electromagnetic Energy and Acupoints—Evidence-Based Treatments—EFT and Performance—Mechanisms of Action—Counterconditioning—Neural Plasticity—Dr. Callahan's First Experience

A 23 year old woman volunteered for an EFT demonstration on the first day of an EFT Level 1 class. Though she was tall and beautiful, with an open, childlike face, she had an air of great sadness about her. She told the group that she had suffered from rheumatoid arthritis since she was a child. She had been treated in various ways, including hydrocortisone injections into her knees starting at the age of 2. The symptoms had abated somewhat at the age of about 18, and then returned in full force two years before. When asked for the current location of the pain, she reported pain in three locations: her right ankle, her left knee, and her left elbow. She was asked to rate the intensity of the pain using a scale from 0 to 10, with 0 representing no pain, and 10 representing the greatest pain possible. The pain in her elbow was 3, her knee 8, and her ankle 5, and was always present, day and night.

Dawson Church, an EFT researcher who was leading the workshop, asked her what was happening in her emotional life around the age of 2, when the symptoms began. In a very low, hesitant voice, she said that her mother and father often had fights, and she began to cry uncontrollably. She and Dawson Church began to do EFT for "the big fight," she had witnessed, for the raised voices of her parents, for the fear she felt when they fought, and for how unsafe she felt when growing up.

Her suffering was so evident that many people in the room began to cry. Yet after about 15 minutes of EFT tapping on various aspects of her parents fighting, she reported a reduction in pain to 1 in her elbow, 5 in her knee, and 3 in her ankle. On the second day of the class, she reported no pain in her elbow and her ankle, though there was still some pain in her knee. She said that she didn't feel it was safe to let go of all the pain yet, and she was encouraged to let it go at her own pace, and not force the process. That second day, her appearance had also changed noticeably. She smiled, and participated light-heartedly in the group, in contrast to the heavy sense of oppression she'd exhibited the day before.

How Is EFT Able to Address Such a Wide Variety of Problems?

Drug treatments for rheumatoid arthritis are described in the medical literature, but not emotional ones; one large medical web site states flatly that, "Rheumatoid arthritis has no cure." How can EFT have an effect so quickly on a problem that has not been solved by all the technology and available to modern medicine? How can it resolve a physical symptom, like the woman's arthritis, when the physical pain is not even addressed with EFT? In the case above, EFT worked on only the emotional issue, yet when that reduced in intensity, the physical problem went away too. The answer to this question that is so central to EFT can be found in the insights science has gained in the past two decades into the way our brains and bodies work.

When you have a traumatic experience as a child, for example, a bully at school knocks you down and you hit your head on a hard surface, you form an unpleasant association in your mind between the event and the pain. Part of our brain has the job of keeping us safe, and is constantly scanning the horizon for threats to our wellbeing. It compares cues from the environment we are in right now with the banks of previous unpleasant experiences stored in memory. When it finds a match, it alerts us to a potential problem. If the bully had light blue eyes and blond hair, you might feel uneasy in the presence of people with similar coloring, without knowing why, as the brain goes on high alert when the possibility of a threat comes within the range of your perception.

The Brain's Ability to Detect Threats

The part of the brain that deals with threats is called the *limbic system* or midbrain, because it is located between the frontal lobes, which are responsible for conscious thought, and the hindbrain, which handles routine tasks like food digestion and blood circulation. The limbic system encodes negative experiences with an emotional charge. In effect, it attaches an emotional tag to a class of memories, the way a shopkeeper might attach a red label to all the items on sale. The red tag distinguishes important items from unimportant ones. It draws special attention to any item with that color tag. Our attention is heightened whenever we see a red tag. These emotional tags are attached to certain memories by the limbic system to warn us of potential danger. So if you had your hand bitten by a dog as a child, you feel a surge of emotional intensity when you see another dog later on, as the limbic system does its job, comparing the new sensory input of a different dog with the negative tag of the pain associated with the previous experience of a dog.

This machinery is very appropriate for physical threats, keeping us away from heights, from poisonous animals and plants, and from other dangerous physical situations. For the human species, this threat-assessment machinery has worked brilliantly for millennia. When our ancestors saw a tiger in the jungle, they took appropriate action: fight or flight. The human fight-or-flight response kicks in very rapidly in response to a perceived threat, and gets the body ready for life-or-death action. Because survival is the fundamental need of a species, there is nothing slow, restrained, or casual about the way our bodies respond. We have a set of genes called the Immediate Early Genes, or IEGs, that click on the moment we perceive a threat. These genes contain the genetic code for stress hormones like cortisol and adrenaline (also known as epinephrine).

Our adrenal glands pump out large quantities of these hormones *less than three seconds* after we recognize a threat; that's how quickly the IEGs are turned on. Stimuli that affect genes are called "epigenetic" signals; they signal the body to turn the appropriate genes on or off. The hormonal part of the stress-response system is referred to in traditional biology textbooks as the HPA Axis, short for hypothalamus-pituitary-adrenal (three key endocrine glands) axis. The stress response is triggered by the hypothalamus gland, part of the limbic system that recognizes stimuli that have red "high-emotion" tags attached to them. It passes that message to the pituitary, using "messenger molecules," molecules that signal other parts of the body to perform specific functions. The pituitary, sometimes called the "master endocrine gland," then signals other glands like the adrenal glands. A surge of adrenaline rapidly flows through the body. Our hearts race, signaled by histamine molecules. The blood vessels in our digestive tract, reproductive system, and all non-essential systems constrict, forcing blood to flow out to our peripheral muscles, making them ready for action. Our immune system shuts down, and the process of cell regeneration (facilitated by cortisol's hormonal cousin, called DHEA) comes to a halt. Our liver dumps glucose sugar into our bloodstream, so that our cells will have an abundant supply of energy. Our pupils dilate, and blood drains out of the frontal lobes of our brains, because we don't need the ability to perform calculus when there's a tiger in the vicinity; we need to be able to see well, and to run fast. Our nervous system goes into overdrive, dominated by the part, called the *sympathetic nervous system*, that handles vigorous activity. All our physiological resources are redeployed to meet the threat. It is this rapid response that has allowed our ancestors to survive; those with slow fight-or-flight reflexes are the ones that were eaten, while those with fast reflexes lived to breed, and produce us. So we're the pinnacles of 3 billion years spent perfecting this lightning-fast fight-or-flight response.

The problem is that modern adult human beings live in a world with very few threats to their physical survival. When was the last time you saw a tiger? This whole magnificent threat-assessment machinery sits at the core of our brains, always turned on, but with few actual objective physical threats to act on. So it occupies itself with imaginary ones: fears, worries, anxieties, resentments, projections, imaginings. When you think of an imaginary tiger, your body responds with a fight-or-flight response, much as though there were a real tiger in the room.

Brain Waves: Beta, Alpha, Theta, and Delta

While this is true of adults, the line between reality and imagination is much more blurry for children, especially those under the age of 6. The predominant brain waves at that age are slow rhythms, called delta and theta waves. In adults, these brain waves are associated with the subconscious, a hypnotic trance, with raw experiencing, and with the ability to download vast amounts of information quickly. The brain waves associated with conscious deliberative thought processes, alpha and beta, don't start to predominate in the human brain till after the

age of 6. Before then, we're in a mental state in which reality and imagination blend freely. We're in something like a hypnotic trance that facilitates rapid learning. Think about children who have an imaginary friend, estimated to be about 65 percent of all children, for an example of the way fact and fancy blend freely in a child's mind. Think about the stories children tell, in which they mix fantasy and actual events, with little apparent ability to distinguish the difference, or interest in doing so. Think about how easily they can invent games of, "Let's pretend."

Traumatic life experiences at that age can be experienced by children as threats to their survival. If Mommy is a raging angry person, and Daddy is a crazy alcoholic, and screaming, beatings, and other scary events can occur at any time, a child frequently has the fight-or-flight machinery activated. A child does not have the cognitive ability yet (those alpha and beta brain waves) to assess the threat consciously and say, "Well Mommy might be yelling, but she probably is not going to actually kill me stone cold dead." The child's cortisol rises, IEGs snap into action, and the sympathetic nervous system goes on high alert. A little boy may run and hide when a parent is raging, a manifestation of flight. That memory is encoded in his limbic system. Now that same person is 40 years old, but when confronted by a similar situation, the limbic system automatically looks for a similar red tag. When a boss or spouse is yelling, it says, "Aha, this sounds like Mom, so I better hide." The man might fall silent, or withdraw emotionally. How many men do you know who withdraw emotionally when a woman gets upset? She then might get more upset at the lack of emotional contact, which then prompts the man to withdraw further, in a dysfunctional relationship dance. In this way, neurological and hormonal responses that evolution gave us, which were perfectly adapted to life on the savannah of 100,000 years ago, cause great grief and misery to us today. These traumas are stored in the brain and the body, sabotaging our happiness, and setting us up for misery in a world in which the tigers in our minds far outnumber the ones in the zoos.

Exposure, Cognitive Change, and Conditioned Responses

EFT works very simply and scientifically. It has us face and remember a negative emotional experience, a method referred to in psychology as "exposure." We then pair that remembered trauma with a new cognitive input, reframing the memory with a statement of self-acceptance: "I deeply and completely accept myself." While we hold these two items in mind, the traumatic exposure and the cognitive re-frame, EFT then has us tap on our bodies. The tapping points used in EFT correspond to points used in acupuncture, and they release stress. Tapping also soothes the body, introducing a non-traumatic physical stimulus, and interrupting the emotional triggering we've created through the traumatic memory. This pairing of a troublesome memory with a soothing physical stimulus often breaks the power of that memory, and it reduces in emotional intensity. In the language of behavioral psychology, we had a *conditioned response* of upset (a red tag) encoded to correspond to that memory. By thinking of the memory often, and getting upset, we've established a strongly *conditioned feedback loop*. Tapping signals the body that we're safe, and so the conditioned loop is broken. Afterwards, the memory is no longer associated with stress by the nervous system. The speed with which EFT can drain the emotional intensity of even long-held memories is quite startling to people who have not witnessed it before.

One example occurred in front of a large psychology conference. A 45-year-old therapist volunteered for an EFT session. She had pain in her neck, and was not able to turn her head to the right. She said she had suffered from this condition since she was nine years old, after being involved in a car accident. The car was being driven by her older sister, who was not yet of legal driving age. She also described how she had worked on this problem using all her psychotherapy

skills for years, but with only limited success.

She did EFT as she described the minutes before the car crash, the crash itself, and the aftermath. After the crash she and her sister were taken to the nearest house, where she sat, blood streaming down her face from a scalp wound, waiting for her aunt to collect her. She described the fear she felt waiting for her aunt, and the moment just before the crash, when she realized that their car was going to collide with an oncoming car. However, even though she worked on all those aspects, and several others, her pain did not subside, and her neck showed no improvement.

Suddenly she gasped, and said, "I've just remembered a detail I'd forgotten. I always knew my sister was driving illegally because she was underage. But I just recalled that, that day, I *dared her* to drive the car." She was flooded by a sense of guilt for her part in causing the accident, and she then used EFT on those feelings. When we checked in on her neck pain, it was down to a zero. And she turned her neck all the way to the right, the first time she had been able to do so since the accident.

Notice how this therapist used exposure, remembering all the details of the accident, and how new cognitive awareness (her daring her sister) opened up, allowing her to find peace and self-acceptance. There are literally thousands of stories on the EFT web site in which people report similar results. Even when the feedback loop of pain or emotional trauma has been reinforced for years, EFT is often able to break it very quickly. When this happens, the neural bundles that have been transmitting the pain and muscle limitation messages appear to be deactivated, and the brain's threat-assessment machinery calms down. When people are hooked up to an EEG (electroencephalograph) machine, and then asked to recall a traumatic memory, the brain waves associated with the fear response are activated. When they do the kind of acupoint tapping used in EFT, their brain state changes to one of calm. When they are then asked to remember the traumatic incident months later, while again hooked up to an EEG machine, their brain waves still remain calm. Measuring the brain's electromagnetic energy field with an EEG gives us a fascinating picture of what's happening to the brain under stress.

Electromagnetic Energy and Acupoints

In the eighteenth and nineteenth centuries, inquiring scientists began to invent instruments capable of detecting these electromagnetic fields. In 1903 a Dutch physician named Willem Eindhoven measured the field of the human heart, which has the strongest electromagnetic field of any organ, and in 1924 he received the Nobel Prize for his work. In 1929, Hans Berger measured the electromagnetic field of the brain, and progressive refinements in instrumentation mean that today, the electrical and magnetic fields of even single cells can be measured. Using the body's energy fields for diagnosis and treatment has led to such medical advances as the MRI (magnetic resonance indicator), ECG (electrocardiograph), and MEG (magnetoencephalograph). Electromagnetic fields are also used to treat many conditions. PEMS machines (pulsed electromagnetism) have been used with great success for depression, as well as physical symptoms ranging from migraine headaches to Parkinson's tremors.

The use of energy fields in medicine has been accompanied by great controversy. In the period between Eindhoven's discovery and his Nobel prize, in 1910, the influential Flexner Report was published in the United States. This report became the basis of the medical system we have today. It rejected homeopathy and other alternative approaches. It condemned electromagnetism in medicine as "irregular science." Yet the evidence of the importance energy fields in human biology continued to grow, from experiments conducted by Russian scientist Alexander Gurwitch

in the 1920s showing that light energy is emitted by living organisms, to studies by Robert Becker in the 1960s demonstrating that microcurrents can stimulate the healing of bone fractures, to the discovery of magnetic magnetite crystals in brain cells in the human limbic system in 1992.

The observation that some kind of energy is involved in biological processes is not new. Chinese acupuncture diagrams dating from around 2,500 years ago show the energy flows that the doctors of that time used as a guide for inserting needles. Fast forward to today; several recent studies have shown that the stimulation of acupoints (acupuncture points) sends signals to the brain, and can be used to treat PTSD (posttraumatic stress disorder) and other psychological problems. Various scientific bodies, from the WHO (World Health Organization) to America's NIH (National Institutes of Health) have compiled a growing list of physical symptoms for which acupuncture has shown itself to be effective. Energy is central to healing, whether it is the electromagnetic energy flows mapped by the fMRI and EEG machines prevalent in Western medicine today, or the acupoint meridians used for healing by the ancient physicians of Eastern medicine.

This body of knowledge is pertinent to EFT. The stimulation of acupoints has been shown in MRI studies to send signals directly to the fear-management limbic system of the brain. EFT studies performed over the last decade have shown that it relieves stress in its many manifestations, psychological and physical. These studies have begun to identify conditions that EFT is best able to treat, and also the underlying physiological mechanisms at work in such rapid healing. As medical costs in Western countries soar, governments and organizations are increasingly insisting on "evidence-based" treatments, those that can demonstrate convincingly that they work. EFT has established an impressive base of research results for a number of mental health problems such as PTSD, anxiety, phobias, and depression, as well as showing promise for physical conditions such as pain, cravings, obesity, and fibromyalgia.

Evidence-Based Treatments

Before we describe the essentials of how to do EFT yourself, here's a quick tour of the scientific evidence showing that EFT works. The studies outlined below were published in peer-reviewed journals. When a psychology or medical journal is described as "peer-reviewed," it means that it uses a committee of reviewers, usually doctors and psychologists, to scrutinize every word and number in a study before publication, and point out any weaknesses or errors, in order to ensure that only high-quality research is published. The studies summarized in this chapter have also all met a test called "statistical significance," which means that there is less than one possibility in 20 that the results could be due to chance. This standard of statistical significance, expressed as a number like $p < .05$, is regarded by the scientific community as a key test of the validity of a study. So when you read somewhere that a study was "significant," this does not mean that it was particularly important, but that it met this benchmark. We're summarizing this research here in *The EFT Manual* so that you have a sense of how grounded EFT is in good science, and that as you go forward with your exploration of EFT, you can do so with the confidence that rigorous, evidence-based methods have been used to establish the validity of EFT. For a more complete picture, including the abstracts of each study, full copies of many of them, and updates as new research is published, you can visit the research section of www.EFTUniverse.com.

The first study of EFT published in a peer-reviewed journal was done by a research team led by Steve Wells, an Australian psychologist. It was a randomized controlled trial (RCT) of people with phobias. RCTs are regarded as the Gold Standard of research, because they control for all of the factors that can skew the results of a study and provide misleading results. Wells and his group identified people with high phobic responses to small animals such as bats, spiders, and

snakes. They tested the aversion of study participants with a Behavioral Approach Test or BAT, which measured how close to the feared animal the subject was capable of walking. They also used other measures of phobic response, and to control for the placebo effect, the second group received an intervention known to be effective on anxiety, called Diaphragmatic Breathing or DB. They found that after half an hour of treatment, the EFT group could walk much closer to the feared animal than those in the DB group. When they re-tested some of the subjects three to six months later, most of the improvement had been maintained.

The Wells study was later replicated by Harvey Baker of Queens University in New York, and Linda Siegel, who introduced additional rigor into the measurements by testing the degree of expectancy participants had that the treatment would help them. Both groups in the Baker & Siegel study had the same degree of expectancy, so the results of the Wells study could not be explained by the placebo effect. The Wells study was also replicated by Maria Salas, Jack Rowe, and Andrew Brooks, of the University of Arizona at Tucson. In this second replication, other phobias such as fear of heights were also tested, showing that the effects of EFT in reducing phobias aren't limited just to the fear of small animals.

While studies are important, replications are equally so. Until an independent research team has confirmed the findings of the first study, there is always a possibility of error. The American Psychological Association (APA) recognizes this in standards it has set for "empirically validated treatments." It has published standards for what constitutes an "efficacious" treatment. An efficacious treatment is defined by the APA as one for which there are two different randomized controlled trials conducted by independent research teams. The studies must show that the treatment is better than either a placebo, an established efficacious treatment, or a group that waits to receive treatment (a wait list). To be regarded as "probably efficacious," a treatment must have been shown to be better than a wait list in two studies that meet these criteria, or are conducted by the same research team rather than two independent teams.

By the APA standards, EFT has met the standards for an "efficacious" treatment for phobias. EFT has met the APA criteria for an "efficacious" or "probably efficacious" treatment for several other psychological problems as well, such as anxiety, depression, and posttraumatic stress disorder (PTSD). Several randomized controlled trials of EFT for PTSD have been conducted. The largest of these was conducted by a research team including Dawson Church, PhD, of the Iraq Vets Stress Project, Crystal Hawk, Audrey Brooks, PhD, of the University of Arizona Psychology Department, Olli Toukolehto, MD, of Walter Reed Army Medical Center, Phyllis Stein, PhD, of the University of Washington Medical School, and Maria Wren of the Veterans Administration Newington Connecticut campus. In their study, 59 war veterans were randomized into either an EFT group or a wait list. The EFT group received six sessions from life coaches, who helped them tap on their combat memories. While the wait list did not improve over time, the PTSD symptoms of the EFT group plunged drastically. This study was designed based on the findings of an earlier pilot study, which also used six sessions, and found that EFT was very effective at lowering PTSD symptoms in veterans. A third study of EFT for PTSD followed a group of veterans and their family members who went through a 5 day EFT intensive that I conducted with a group of coaches and therapists. Their PTSD levels also declined precipitously; one said afterwards, "I got my life back again." Their experience is now the subject of a documentary film: "Operation Emotional Freedom." A separate research team composed of faculty from Marshall University Medical School, the University of California at Berkeley, and George Washington University, has conducted an independent replication of these studies, in order to establish EFT as an "efficacious" treatment for PTSD using APA standards. There are many moving stories of veterans who've been helped by EFT in the book *EFT for PTSD*, as well as insights from those