UNDERSTANDING YOUR BRAIN

By

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"*The soul becomes dyed with the color of its thoughts*."
— Marcus Aurelius — Roman Emperor from 161 to 180 AD

Managing Our Vibrations Is The Next Big Skill Set

It has long been known that thought produces a chemical reaction in the brain, causing it to release chemical signals that are transmitted to the body. These chemicals are called neuropeptides, and when they are released they cause your body to *feel* the way you were *thinking*. That is why you experience feeling happy, sad, worried, angry, content, inspired and so on.

Our world would be a very confusing place if you experienced something that would normally make you happy, but instead of your brain producing chemicals for feeling happy it produced the chemicals that make you depressed. Or, if you experienced something that should make you happy, but your brain arbitrarily produced the chemicals to be angry. Because our brain is consistent about creating the correct chemicals for the same situation, over and over again, it becomes possible to create mental maps of our experience that help us make sense of our world. It is our perception of things that tells the brain what chemicals to create, so how we think about something and how we feel about it match one another, and remain consistent. You may have heard the adage, "Nothing in life has meaning, except the meaning we give it." Once our perception about things is created and a feeling is decided upon, a burst of acytlecholine is released. This binds the experience with the emotion and the meaning we have given it, creating what we call a *cognition*.

In neuroscience we understand that when you are having positive thoughts, the brain produces a chemical neurotransmitter known as *dopamine*, which triggers the brain in the left frontal lobe in anticipation of an experience that you know as excitement. The opposite is also true. If you driving on the freeway and some knucklehead cuts you off and you feel angry, the brain produces the neuropeptides that causes the body to respond by feeling angry. Our brain records

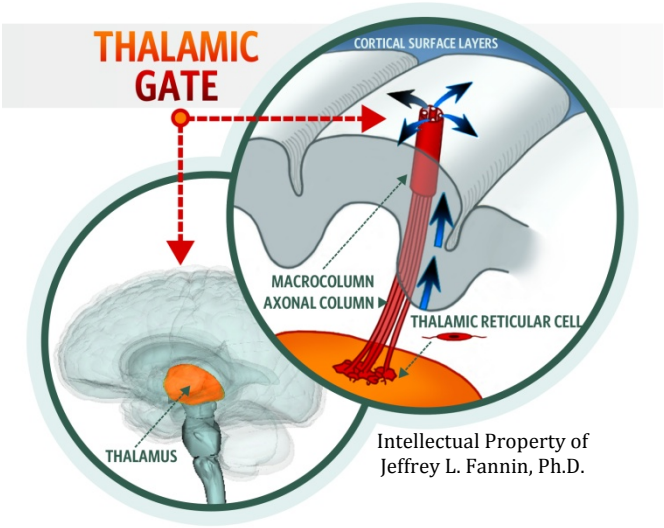
these cognitions and files them away for future use. Your thoughts are important; they initiate responses in the brain that affect not only your emotions, but also your physiology.

THOUGHTS

The Physiology of Thoughts

Contrary to what was once believed, the brain is not the only center where our neural responses are stored. As we have briefly mentioned in an earlier chapter, there is now growing evidence that our thoughts, which are no more than electrical signals whizzing along our neural pathways, are stored in our cells as *somatic memory*, resulting in permanent changes in the way our body and brain influence each other.

Deep in the center of the brain is a small almond shaped organ known as the *thalamus*. The thalamus is an extremely complex structure that has several functions. One is to maintain arousal and wakefulness. Another is to act as the brain's information censor and gatekeeper, and as a relay station, receiving information from all the sensory organs and sending it for processing in the thinking part of our brain, the cerebral cortex. Think of it as the first processing station for information stemming from the outside world [1]. The reason why sensory information makes a stop in the thalamus on its way to the cortex, as opposed to proceeding directly to the cortex, is not entirely clear. But the thalamus appears to have an important role in the information's selection, ordering, and organization.



The thalamus can be considered the central command post of the brain. Nothing comes in or goes out without passing through it. This includes sensory information related to what we are experiencing, instructions being sent to various organs on how they should perform their function, and trafficking various frequencies in the brain to keep us functioning day or night.

When it comes to our thoughts, the thalamus plays a large role in how we process "thought

energy." We send and receive energy at different frequencies; the packets of vibrating energy carry information both within the body, and to and from the universe around us. We live in an energy field, and we are part of that energy field. Because of our connection with the energy in the "field," we are constantly communicating with it. As we have seen earlier, thoughts are basically energy and information. When the energy travels along our "neuro highways" it communicates with the cells of the body, passing information to the cells so they can perform their function. Vibration taking place within the body, cell-to-cell, we call *resonation.* If the energy and information come to us from outside the body, we call it *oscillation.*

There is a special part of this communication network that we call the *thalamic gate.* It sits atop the thalamus, in the center, where there is a set of thalamic reticular cells. The purpose of these cells is to adhere to the top of the thalamus, connecting it to the formation of the *axonal column cells*. There is a sheath surrounding the axonal column cells called the *macrocolumn,* that insulates the energy transmitted along the axonal column from other brain wave activity. This cellular structure creates a pathway for our thoughts to travel from the thalamic gateway at the top of the thalamus, through the sub cortical, or subconscious part of the brain, into and through the thinking part of the brain known as the cortex. It then comes out at the top-center of the head. In some cultures this area of the brain is identified as the "crown chakra." This is the mechanism for connecting with oscillating energy and information from the "field," moving it to the thalamic gate, where it changes from oscillation to resonation, and then transmitting that energy and information to the cells, organs and systems of the body.

You might be interested to know that 95% of everything we think, say and do comes from the subconscious part of our brain. That means only 5% comes from the cortex, or thinking part of the brain[3]. You might also find it interesting to know that the cortex processes at 40 bits of information per second, whereas the subconscious part of our brain processes at 40 million bits of information per second[4].

As our brain processes, catalogues and stores the information from our thoughts, and information coming in from the field, it creates memories to be learned, stored and made available for future recall.

We have seen already that somatic memory includes three types of memories: *engraved memories (engrams), muscle-memories* and *bio-memories*. Engrams are bio-chemical changes that occur in our neural tissues as the result of a powerful or persistent reaction to any situation. An engram is not an ordinary memory, but more like a photograph of the situation or event, complete with the emotional response that accompanies it. Engrams exist just below the level of our consciousness, influencing our emotional responses - usually without our knowledge. While engrams affect our emotional responses alone, muscle-memories are memories that have become so deeply embedded in our system that they can recreate the physical symptoms accompanying these emotions, like those experienced during strong fear or anger.

Muscle memories are also responsible for our performing repetitive mechanical actions. Muscle memory has been used synonymously with motor learning, which is a form of procedural memory that involves consolidating a specific motor task into memory through repetition. When a movement is repeated over time, a long-term muscle memory is created for that task, eventually allowing it to be performed without conscious effort. This process decreases the need for attention and creates maximum efficiency within the motor and memory systems. Examples of muscle memory are found in many everyday activities that become automatic and improve with practice, such as riding a bicycle, typing on a keyboard, playing a musical instrument, or martial arts.

Bio-memories are memories that are locked into our cells. They carry hereditary memories that are also known as *genetic memories*. In psychology, genetic memory is a memory present at birth that exists in the absence of sensory experience, and is incorporated into the human genome over long spans of time. It is based on the idea that common experiences of a species become incorporated into its genetic code, rather than by a Lamarckian process. (The Lamarckian process is the idea that an organism can pass on to its offspring characteristics that it has acquired during its lifetime. This is achieved by a tendency to encode a readiness to respond in certain ways to certain stimuli.) Genetic memory is invoked to explain the *racial memory* postulated by Carl Jung. In Jungian psychology, racial memories are posited memories, feelings, and ideas inherited from our ancestors as part of a "collective unconscious"[5].

Bio-memories have become part of the very fiber of our current personality through constant repetition for years. Both physical and mental patterns can become part of our bio-memory. Bio-memories have the power to trigger physical actions like fight or flight. Mental states like depression and anxiety can quickly become part of our bio-memory if we are not careful. Bio-memories are not only unconscious, but are usually untraceable to any particular source incident.

As long as they are stimulated to do so, our brains will keep forming new dendrites and adding new neuropathways throughout our life. This process is called *neurogenesis,* with the stimulation that prompts it coming from our learning experiences and other activities. In capturing our attention, our experiences put the brain into a state of heightened awareness that turns on the switch that affects the expression of the genes that stimulate the formation of new neurons. Where most of our organs stop growing in our late teens, our brains are being continually stimulated by new behaviors, discoveries, physical exercise, novel environments, and new memories all prompting neurogenesis[6].

Here is an example of how a simple thought can become an engram or a memory that triggers emotions, recall of a person, place or an event in time. Nearly everyone will relate to this, and it will be familiar from earlier in the book. Imagine hearing a song; the memory of where you were and what you were doing when you first heard that song comes flooding back. That is an engram or bio-memory. Our brain assembles and records an experience by taking all its elements and putting them into what is known as a "cognitive construct." The brain note of the time, the place, who you were with, what you were doing, how you felt, and then receives a burst of the neurotransmitter *acytlecholine*. This is a chemical released by nerve cells to send signals to other cells, binding them all together with the song. After this binding process, every time we hear the song the brain plays back the memory, bringing back all the associations and feelings that go with it.

Our brain is loaded with such memories, some very pleasant and others not so pleasant. It is possible to get rid of the not so pleasant ones by using EMDR, Eye Movement Desensitization and Reprocessing. If you think about the memory that you would like to change, get as

associated to it as you can. Close your eyes and really see that experience, feel all the feelings that are present. Next, while sitting, get a sense of the emotional intensity; on a scale of 0 to 10, how intense does it feel emotionally? As you are reliving this experience in your mind, tap on your knees, alternating left and right. Tap on the left knee, then tap on the right knee; keep the alternate tapping going for about a minute as you focus on the unwanted thought, then stop. Now measure the intensity again from 0 to 10. Most likely it will be less.

Why? The alternate tapping stimulates the left and right hemispheres of the brain, causing a new burst of the neurotransmitter acytlecholine to be released. That new burst of acytlecholine unlocks the emotion from the event. It does not erase the event, you can still remember the details; but it is no longer connected to the emotion of the memory. You can keep doing the alternate tapping on your knees until you notice that the emotion has dropped to a one or two on the scale of 0 to 10. You will feel more at ease from the unwanted memory, and should it be triggered in the future, you will have not emotional attachment to it.

Brain wave Frequencies

At the root of all our thoughts, emotions and behaviors is the communication between neurons within our brains. Brain waves are produced by synchronized electrical pulses from masses of neurons communicating with each other. These pulses can be detected using sensors placed on the scalp, and categorized by dividing them into bandwidths. These bandwidths are best thought of as representing a continuous spectrum of consciousness.

At any given moment, the brain is producing a variety of different frequency pulses. Each group of frequencies has a job, or purpose within the brain, the body and in the quantum energy field. Overall, they play a significant role in our individual experience of reality, and in our relationship with our self and others. To help understand the special functions of each frequency group, we bundle them together and give them names: delta (1-3 Hz), theta (4-8 Hz), alpha (9-12 Hz), beta (13-30 Hz) and gamma (31-100 Hz).

Understanding The Role of Brain wave Frequencies

It is important to know that all humans display each of the five different types of electrical

patterns or “brain waves” across the thinking part of our brain, the cortex. The brain waves can be observed with an EEG (electroencephalograph), allowing researchers to note brain wave patterns. In carrying out its set purpose, each brain wave aids us in our daily mental functioning. Our brain’s ability to become flexible and/or transition through various brain wave frequencies plays a large role in how successful we are at managing stress, focusing on tasks, getting a good night’s sleep, and much more. If one of the five types of brain waves is either overproduced or under produced in our brain, it can cause problems. Bear in mind that no single brain wave is “better” or more “optimal” than the others. Each serves a purpose to help us cope with various situations; whether helping us process and learn new information, or to calm down after a long stressful day. In order of slowest frequency to fastest, the five brain waves are: delta, theta, alpha, beta, and gamma.

BENEFITS OF DELTA BRAIN WAVES

Release of anti-aging hormones - One of the benefits of increasing your delta brain waves is the release of anti-aging hormones. The delta brain wave pattern stimulates the release of melatonin and DHEA, more correctly known as didehydroepiandrosterone. Both of these are powerful anti-aging hormones. Delta brain waves are also associated with decreased levels of cortisol - a hormone linked to stress, that has been scientifically proven to speed up the aging process.

State of empathy - Delta brain waves can provide you with the ability to read other people’s emotions and determine their feelings at an unconscious level. In healthy amounts, delta brain waves cause a person to have an advanced state of empathy, understanding, and compassion for others. If you are always able to relate to others and can, as some people put it, "read other people's minds,” you probably have more delta than the average person. If you find yourself getting into trouble for not being considerate enough or for "stepping on other people's toes,” you may have less overall delta brain wave activity.

Extreme bliss - Advanced meditation practices and yogic traditions have associated the delta brain wave frequency range with a feeling of all-encompassing bliss. Since most people aren't able to consciously experience the delta brain wave state, it may be tough to feel extreme bliss

from the delta waves like yogis, monks, or advanced meditators. That said, there have been people who have testified to feeling the bliss associated with the delta brain wave while performing extremely deep meditation.

Advanced healing of body and mind - The delta brain wave rhythm is known to completely rejuvenate, replenish, and heal the entire body and brain. The delta brain wave revives the body after a hard day by regenerating necessary chemicals while a person is asleep. Due to the deepest levels of relaxation that the delta brain wave provides, the body and mind are easily able to restore themselves after minor stress, a rigorous workout, or after boosting your brainpower.

Human Growth Hormone (H.G.H.) Release - The delta brain wave is associated with the stimulation of the pituitary gland, which in-turn is able to release human-growth-hormone, commonly referred to as H.G.H. It doesn't release enough for you to skyrocket in height and weight. The delta brain wave will not provide adults with a second version of puberty. However, there is evidence that it does release slight amounts of H.G.H. in certain individuals. If you are looking to increase your H.G.H., you could consider using delta brain wave entrainment and evaluate how it works out for you.

Connection with unconscious mind - Though the alpha and theta brain waves are capable of bridging the gap between conscious thoughts and the subconscious mind, the delta brain wave goes further: it allows us to connect with the deepest possible level of our consciousness. The goal of many meditation practices is to experience and consciously control the unconscious mind. The subconscious mind, or our brain’s right-hemisphere, becomes activated when slower brain waves like alpha, theta, and delta waves kick in. If you spend too much time in beta, it may feel incredible to finally relax and give yourself a chance to connect with your deepest sense of awareness.

Deepest possible level of mind / body relaxation - Delta brain waves while a person is conscious or awake, are extremely rare. However, advanced meditators and infants are two groups of people who are able to enjoy the deeply relaxing benefits of the delta brain wave. Remember what you felt like when you were an infant? Probably not; but the delta brain wave is associated with extreme relaxation, and completely unconscious mental processes.

Perfect intuition - Ever have a powerful gut-instinct that helped you make a good decision? Or a gut-instinct that you probably should have followed? If we get ourselves too caught up in the upper brain wave patterns of beta, our intuitiveness becomes less effective. As you increase your theta brain waves and your delta brain waves, your intuition will increase and so will your ability to recognize the feelings in your "gut." There is some disagreement as to whether or not theta brain wave patterns are better for intuition compared with delta, but most research suggests that if you can become consciously aware in the delta brain wave state, you will have a nearly perfect sense of intuition. I will discuss intuition in more detail later in this book.

Connecting with the spiritual body - Many consider the delta brain wave to bridge the conscious mind with higher planes of reality with the subconscious mind. Advanced spiritual gurus have considered delta, as the slowest brain wave pattern, to be the one that connects their spirit and their body to universal life energy. Becoming consciously aware of experiencing the delta brain wave frequencies has been associated with the deepest sense of spirituality, highest sense of internal awareness, and feeling directly connected to a Higher Power.

Paranormal Experiences - People are especially open to O.O.B.E.'s (Out Of Body Experiences), astral travel, connecting with spiritual beings (i.e. "spirit guides," "angels," etc.), E.S.P., and other phenomenon in the delta brain wave range. Though most paranormal and psychic experiences can be argued to be real or fake, there is evidence that people tend to have them when their brain is producing higher than average amounts of delta, and /or theta brain waves. Though spiritual experiences and phenomena are commonly experienced in the theta brain wave state, the delta brain wave state has been associated with them too.

Boosted Immune System - Increasing your delta brain waves can lead to a boosted immune system, due to the fact that delta brain waves are associated with age-reversal or slowing, the production of healthy hormones, and significantly decreased amounts of stress. A further boost comes from the fact that delta brain waves are associated with healing and rejuvenation of the body. Stress, and too much anxiety, can damage the immune system by releasing harmful chemicals such as epinephrine (adrenaline) and too much cortisol, a hormone associated with adrenaline release. The delta brain wave releases pleasant chemicals and neurotransmitters to

help keep your immune system at arguably its highest rate of performance.

WHO HAS HIGH AMOUNTS OF DELTA BRAIN WAVES?

Advanced Meditators - The goal of many meditation practices is to increase the amount of slower brain wave patterns. Usually, after practice, meditators are able to become consciously aware in the alpha, and possibly the theta brain wave ranges. It takes a substantial amount of meditation and dedication to become consciously aware during the delta brain wave state. After you gain a lot of meditation experience, you can eventually learn how to shift your brain waves from the beta range, through the pleasant calmness of alpha, into the extraordinary theta range. If you get lucky, you'll eventually cultivate awareness in the delta range. Experienced meditators are able to recognize and control their state of awareness and brain waves. Like any practice, the more you do it, the better your chances of passing through the alpha brain wave range, into theta, and from theta into the delta brain wave rhythm. There will be more information later in this book regarding heart and brain coherence.

Delta brain waves are not only abundant in those who are in deep meditation, but they are also abundant in new born infants, young children, people with A.D.D. or A.D.H.D., people who have had near death experiences, or people who have experienced head injuries.

THE BENEFITS OF THETA BRAIN WAVES

The Paranormal- No matter what you may think about psychics, or the world of the paranormal or unexplainable, there are people who are so relaxing in both mind and body that they have the power to channel the unknown by communicating with the deceased, or be clairvoyant enough to receive information about your future. There are a lot of other unexplainable phenomena as well. Have you ever experienced physical pain that arose for no reason whatsoever, like headaches or migraines? Other people have reoccurring and traumatizing nightmares night after night for no apparent reason. Is there a way to eliminate these stress reactors, or are they here for good?

Sleep and Dreaming- Theta brain waves are slow and relaxing brain waves that are usually associated with sleep and dreaming. Located in the right hemisphere of the brain, they usually

arise when we are dreaming, sleepy, emotional, relaxed or daydreaming. Although we all possess theta brain waves, they are most accessible to people who struggle with ADD (Attention Deficit Disorder), or who dream in a very relaxed state. Artists are known to have frequent theta brain waves, as can other highly creative individuals. Whenever we are really and truly relaxed, dreaming in a deep slumber or creatively thinking, we may be utilizing theta brain waves. When we are consciously awake, our brain waves are going at 13-40 Hz (Hertz), which is known as beta brain waves. When we are meditating or in a deep relaxed state, our alpha brain waves measure at 9-12 Hz. However, when we are dreaming, our theta brain waves measure out at 4-8 Hz, which accounts for a deep relaxation that no other level of our brain waves can match. This brings many benefits for both mind and body.

Musicians, sculptors and artists - Since theta brain waves operate at a much slower rate, they bring considerable benefits to our state of mind. Many adults experience very little theta brain waves during their waking hours, but children two and under often experience theta on an ongoing basis. Children have the ability to feel relaxed at all times (except when they cry) but as adults, our brain is usually experiencing more alpha or beta brain waves. When we sleep and are totally relaxed, we can experience theta brain waves easily. Musicians, sculptors and artists of many genres experience more theta brain waves than other individuals. This is because they tap into theta brain waves as a way to become creative when their 'artistic juices' have run out.

Help for business professionals - Since theta brain waves are considered faster brain activity than delta, they offer many benefits you can utilize in the workplace. The common drawback of the beta brain wave pattern is that it can block people from getting past conflicts and finding solutions. Theta brain waves can bring an increased amount of problem solving ability, helping writer overcome 'writer's block' or helping business professionals move beyond the problem at hand and see the larger picture. Theta brain waves can also contribute to lowering the stress level overall. There's a good chance that anyone who has a large amount of theta brain waves ongoing as they move through their day and night, will experience less stress and better coping abilities when a stressful situation arises. Theta brain waves bring decreased levels of anxiety and neurosis.

There's no question here: learning language as we become older is not as easy as when we were children. Part of the difficulty in adapting our memory to learning a language quickly comes from our brain waves. What is blocking us from retaining information easily as we age? Since theta brain waves are so commonly found in children, there is a strong correlation between the presence of theta brain waves and learning languages and language development. When we have theta brain waves in our consciousness as an adult, our ability to learn language increases. Theta brain waves can also explain the connection between our physical and spiritual selves. If you've ever wondered why some people have a stronger spiritual connection than others, it could be due to theta brain waves, which are suggested to improve spiritual awareness and insight. Theta brain waves are also thought to improve a person's ability to experience ESP (extra sensory perception) and receptiveness to paranormal activity.

Difficulty in concentrating - With so many benefits, what could possibly be the drawback of theta brain waves? People with ADD have trouble focusing, as their condition makes it difficult to concentrate on one thing for too long. Theta brain waves contribute to this lack of focus. Another downside of theta brain waves is that they can produce feelings of depression, which are relieved when you move into the beta or alpha range. Boredom is a common feeling experienced with theta brain waves; if you experience boredom or become uninvolved with life's usual activities for too long, you may want to think about contacting your doctor.

Depression - is quite common with people who have large amounts of theta brain waves. If this is the case with you, it's important to be very cautious about your symptoms. For example, if you have a loss of appetite, become highly impulsive, or stop taking pleasure in activities you normally enjoy, consult a professional. However, there are so many benefits to theta brain waves, that for many people it's worth improving the amount they experience. Playing video games can shut down the beta brain waves, and switch your brain to a visual type of thinking that produces creative, theta activity on a regular basis. Meditation can help drastically lower your theta brain waves, especially when done on a regular basis. It doesn't matter whether you choose to meditate, play video games or indulge in more artistic activities to increase your theta brain wave activity. All contribute to more productivity, more creativity and the improvement of your memory.

THE BENEFITS OF INCREASING ALPHA BRAIN WAVES

Deep relaxation of body and mind – Your stresses and worries drift away when you enter the alpha brain wave state. Tension and nervousness disappear as your brain's thought process is calmed down; your mind becomes clearer.

Higher levels of creativity – Like theta brain waves, alpha brain wave levels are also found to be much higher in artists, musicians and creative thinkers. Creative thinkers also tend to be those who go on to become world famous entrepreneurs, as they are better equipped at solving life's problems and helping others. Right now, employers are looking for new and innovative ideas to help them survive a troubled economy. Those who have an entrepreneurial edge are making vast fortunes from the wealth of opportunities that exist for creative alpha-minders.

Improved problem solving abilities – When you have too much beta activity in your brain, your ability to problem-solve shuts right down. Stress causes clutter in your thought process. The solution is to produce more alpha waves. If you ever get writer's block, or get stuck on an important task, getting that "aha" moment of creative inspiration is possible when you learn how to switch on your alpha mind and get back into your state of "flow."

Improved mood and stability of emotions – Having more alpha brain waves usually indicates more positive, stable and balanced emotions. This means you can cope better with stress and keep calm in tough situations. Irritable, anxious and over sensitive people tend to spend most of their time in a beta state, and can usually greatly improve their minds by increasing their alpha brain waves - without resorting to taking drugs, excessive alcohol or other bad habits.

Performance and getting in the "zone" – the alpha brain wave state is associated with "peak performance." Players who get "in the zone" perform best when they have less beta brain waves interfering with their peak, alpha state of mind. Studies on professional sports players have shown they have a surge in alpha brain waves in the left side of their brain just before making a successful shot or playing decision. Those who fail tend to have a flood of beta brain waves in the left side of their brain instead. It has been shown by experiments like these that "over

thinking" (beta) or "under thinking" (theta) both have a negative effect on game play, but being in an alpha brain wave state is the perfect state for high performance.

"Super learning" and "Genius states" – learning new skills, enhanced memory and genius-like abilities are found in those who spend their time mostly in an alpha brain wave state. This is because the tasks associated with those abilities require less overall effort to accomplish, and the capacity to retain large amounts of information is enhanced. It is believed that Albert Einstein was able to produce healthy alpha waves that contributed to his genius.

Enhanced immune system – Long-term stress and tension have a negative impact on your immune system, and can even shut it down completely in extreme cases, due to the excessive production of cortisol and adrenaline. When you are in an alpha brain wave state, you are in a relaxed state where your immune system is allowed to work at its best. The "feel good" effect of alpha brain waves leads to the production of happy, well-functioning cells in your body, which provides a healthy and efficient immune system ready to protect you from any disease.

Levels of "Serotonin" – Serotonin is released more during alpha brain wave states. Serotonin levels are associated with your moods, and low serotonin levels are linked to depression and other neurological disorders, such as anxiety and panic attacks. You can purchase serotonin supplements at most health food stores or places that sell vitamins, it is also known as 5-HTP.

BENEFITS OF BETA BRAIN WAVES

Ability to think quickly – When a person is high in beta brain waves, they are able to think fast, generate new ideas quickly, and live in a high state of functioning. Quick thinking and mental processing definitely help when applying for a job in the 21st century, or preparing for exams. Studies have shown that people who think quickly feel more confident, happier, and actually live longer than slower thinkers. There will be more information in later chapters on how to measure your brain's processing speed and how improve it.

Being more sociable – When a person talks, their beta brain wave range naturally increases. If

you are interested in becoming more sociable, an increase in beta brain waves may be the ticket. In most people, an increase in beta activity boosts conversational energy and ability to keep a conversation going. I've had personal experiences in the high beta brain wave range, and can confirm you are more sociable, period.

Feeling excited – Ever get that nice healthy adrenaline rush or feeling of excitement in the pit of your stomach? That feeling is caused by an increase in the amount of beta brain waves. Beta waves kick in when people get excited, and definitely feel invigorating.

Goal oriented – When people are in the beta brain wave state, they naturally feel more goal-oriented. It could be due to the fact that they have more energy, are more sociable, and have high levels of focus that cause them to be more goal-oriented. It could also be the fact that an increase in left-hemisphere brain functioning is associated with goals and goal setting. Either way, it will definitely get you more pumped up and inspired to achieve your goals.

Peak-performance – Though a specific peak-performance brain wave pattern is heavily debated, beta brain waves can certainly aid in performance ability. When a person's focus skyrockets, and their energy levels skyrocket, their performance abilities will naturally increase.

Highest levels of focus – Have mental fog and a low level of focus? Beta brain waves may be the solution to turning that around. People with ADD and ADHD are commonly prescribed stimulants, which increase beta brain wave activity in their brains, bringing an increased ability to focus, get things done, and all the other things associated with beta waves.

More energy – Do you lack energy? Are you always tired? Well, beta brain waves could definitely help you out. People low in beta brain waves feel tired and report less overall energy throughout the day. To get out of a sleepy state and lift that mental fog, consider increasing your beta waves.

Positive thoughts – I've definitely noticed that I feel less depressed and am constantly able to generate positive thoughts when in a high-beta mental state. Positive thinking and an increase in beta waves make perfect sense, because the left-hemisphere in the front of the brain is associated with positive thoughts.

Write easily and quickly – When beta brain wave levels are high, one's ability to write increases. Beta activity occurs in the left hemisphere that is highly activated while writing. I can personally testify for this one: my ability to write is definitely enhanced when I am able to get into a left hemisphere state of beta.

Increase in I.Q. – Studies have shown that people higher in the beta brain wave range actually have higher I.Q.'s than the average population. It makes perfect sense, since activities like reading and solving math problems can definitely help build a smart brain.

As with anything, too much beta activity can be a bad thing. By no means would it be a good idea for you to increase a brain wave that you already have high levels of. In fact, you may experience the horror of too much beta brain waves, as they can cause:

Anxiety –Too much beta activity, particularly in the back of the brain, may cause you to feel afraid or have fearful thoughts towards things that you usually find calming. If your brain waves get high enough in the beta range, you may develop fear of things that it's not normal to freak out over.

Stress – Though there are many good things that come with beta waves, there is also a real possibility that they may stress you out. Their link to increased stress is why it is important to learn how to shift your brain waves when needed.

Paranoia – Paranoid schizophrenics are actually able to generate much more high-beta (25-30 Hz) activity than the average population. Are beta brain waves the cause of schizophrenia? No, they are a side effect; schizophrenia is much more complex than that. Increasing beta brain waves will not increase the likelihood of you becoming crazy, but they could make you feel more paranoid than usual. Always checking the locks and worried that someone will break in?

It may be time to boost that alpha brain wave pattern and tone down the beta.

Muscle tension – Another drawback to beta brain waves is that your body will feel uneasy, and muscle tension increase. Nobody enjoys feeling tense, and unable to relax your muscles. Avoid high amounts of beta activity to avoid this.

Increased blood pressure – High blood pressure is not usually something to be proud of. Beta brain waves cause an increase in stress and naturally increase your blood pressure. If your blood pressure is already high, chances are good that you know what a beta brain wave state feels like.

Unwanted thoughts – Beta brain waves can be a source of unwanted or anxious thoughts. Too much beta activity can cause a mild form of obsessive-compulsive disorder. Rapid, random thoughts that are beyond control can potentially haunt the person who is high in beta.

Insomnia – Want to stay up all night? If so, I recommend increasing your beta activity. It is probably a bad idea to do any beta-geared activity right before falling asleep. Keep your brain healthy, get that sleep, and work to prevent insomnia.

Addiction – Are you addicted to the Internet? Chances are that if you have an addiction, you would greatly benefit from downscaling your current amount of beta brain waves. Look at "how to boost your alpha brain wave" to help you curb, and hopefully eliminate, your addictions.

BENEFITS OF INCREASING GAMMA

The brain's optimal frequency - Gamma brain waves are considered the brain's optimal functioning frequency. Gamma brain waves are commonly associated with increased levels of compassion and feelings of happiness, as well as a conscious awareness of reality and increased mental abilities. Gamma waves are also associated with perception and consciousness. They are produced when masses of neurons emit electrical signals at the rate of 38 Hz – 200+ Hz and have

a small amplitude. Found in virtually every part of the brain, gamma brain waves serve as a binding mechanism between all parts of the brain, helping to improve memory and perception. By one definition, gamma waves are manifest at 24 Hz and higher, though researchers have recognized that higher level cognitive activities occur when lower frequency gamma waves suddenly double into the 40 Hz range.

Gamma present in awake state and during active rem - Research has shown that gamma waves are continuously present during Low Voltage Fast Activity (LVFA), which occurs during the process of awakening, and during active Rapid Eye Movement (REM) sleep. Some researchers do not distinguish gamma waves as a distinct class, but include them in beta brain waves. New evidence has emerged of brain wave states above the highest recognized brain wave frequencies of beta (30 Hz). Gamma brain waves resonate around 40 Hz, and are associated with the brain function that holographically synthesizes all the bits of individual data from various areas of the brain, and fuses them together in a higher perspective.

Gamma is the Harmonizing Frequency - for example when you are observing an object, its color, size, texture etc., they are all perceived and processed by different parts of the brain; but it is thought that gamma allows the separate strands of information to be unified in an overview. Gamma brain wave activity is associated with states of self-awareness, higher levels of insight and information, psychic abilities and out of body experiences. This new region of brain activity and states of consciousness is associated with what are called *epsilon brain waves*.

Theta and gamma rhythms interact - helping the brain package information into coherent images, thought and memories. EEG researchers are noticing extremely high brain wave frequencies above gamma, at up to 100 Hz. Totally opposite speed brain wave frequencies, some at 100 Hz and others at less than 0.5 Hz, have exactly the same states of consciousness associated with them. These high-range brain frequency states are named *hyper gamma*. Later information shows new evidence of frequencies even higher than this, at almost 200 Hz, known as *lambda* brain wave frequencies and states of consciousness. These hyper gamma, lambda and epsilon frequencies are linked together in a circular relationship. If you looked with a magnifying glass at an extremely slow epsilon brain wave frequency, hidden within it you would see a

modulation frequency of 100 - 200 Hz.

Epsilon and lambda brain waves - If you stand back far enough from an extremely fast 200 Hz brain wave frequency, you would see that it is riding on the crest of a slow motion modulating wave of epsilon. This epsilon state of consciousness, the state yogis go into when they achieve "suspended animation," is where western medical doctors can perceive no heartbeat, respiration or pulse. Hyper gamma and lambda states of consciousness are the states associated with the ability of certain sects of Tibetan monks, who can meditate in the Himalayan mountains in sub-zero temperatures with scanty clothing and melt the snow around them. Fast, gamma rhythms range from 30 to 100 Hz, and may vary in frequency during a response. The 20-100 Hz ranges we consider here, overlap the beta band 15 to 30 Hz.

Gamma and sensory stimuli - In humans and other mammals, there is an increase in gamma activity following sensory stimuli. Gamma waves often occur in brief runs in these responses. Initially, researchers found 50-60 Hz in the olfactory bulb (sense of smell) in the brain. Since then they have also been found in the visual, auditory, somatosensory, and motor cortices. Gamma oscillations also occur in the hippocampus, where the link with external sensory stimuli is less direct, but may still exist in the higher order sensory cortices. Hippocampal gamma tends to occur during the theta and alpha, 4-12 Hz, EEG that is a prominent feature of the hippocampus in vivo. (*In vivo* is Latin for "within the living," and refers to experimentation using a whole, living organism, as opposed to a partial or dead organism, or to *in vitro* "within the glass", which refers to an experiment in a test tube or petri dish). In humans the auditory response includes brief "40 Hz transient responses" which increase when the subject pays attention, and which disappear with loss of consciousness during anesthesia.

Gamma rhythms can be very widespread - Repetitive auditory stimulation at ~40 Hz generates a large "40 Hz steady state response". MEG (magnetoencephalography) recordings in humans suggest that gamma rhythms can be very widespread, both during waking and dream states. Other MEG measurements in man suggest that gamma rhythms may be organized to sweep across the whole brain, perhaps providing "temporal binding into a single cognitive experience".

PROBLEMS ASSOCIATED WITH EXCESSIVE GAMMA BRAIN WAVES

Some anxiety - Though gamma brain waves are usually not correlated with stress and anxiety, they can be. When a person mostly displays high amounts of beta brain waves in combination with gamma on an EEG, the individual probably has very high levels of anxiety. Though gamma brain waves usually decrease when we are under stress, the dopamine released from gamma brain waves can actually cause us to feel overanxious, nervous, or tense. It is best not to increase both gamma and beta brain waves at the same time. Depending on your current brain wave state, it is important to recognize that though you are usually safe with increasing gamma, overdoing it may make you feel unpleasantly anxious.

Clear, conscious perception of reality - Some people are not prepared for the mental awakening that is associated with gamma brain waves. If you are currently living a fairly unfocused life and happen to begin increasing the gamma brain wave, it may feel like a huge jolt to your consciousness. While it can be a good idea to work on increasing the gamma brain wave, it should be done slowly and in moderation. Too much gamma will actually give you a headache. It is important not to become disturbed by your brain's initial reactions to an increased gamma brain wave and perception of reality.

GETTING A GOOD NIGHT'S SLEEP

Gamma brain wave activity is present in rapid-eye movement (R.E.M.) sleep and is associated with dreaming. Getting a good night's sleep is important for staying healthy, and having a healthy, powerful brain. Gamma brain waves also increase the moment we awaken. Though we are in the theta brain wave for most R.E.M. sleep, the gamma brain wave is present along with the theta. Most non-dreaming, deep sleep is linked to an increase in delta brain wave activity, whereas dream-sleep is mostly linked to gamma and theta brain wave activity.

Meditation - The goal of most types of meditation is to lower the brain waves into the alpha-theta brain wave range. You can learn to become more aware and increase awareness of your brain wave state; your gamma brain wave activity will then increase naturally. A very safe,

healthy way to attempt to increase your gamma brain waves is to make the act of meditation a daily habit, or start up a meditation routine. If you are already meditating, great, you'll increase your awareness naturally. As you increase your awareness, your gamma brain wave will increase.

Self-Hypnosis - As with meditation, the goal of all hypnosis and self-hypnosis programs is to target the lower brain wave ranges (i.e. alpha and theta) and implant new beliefs. Though you are slowing your brain waves, your concentration levels are skyrocketing. Only having large amounts of alpha and theta, without gamma, would make self-hypnosis very difficult, and ineffective. The more often you participate in self-hypnosis, the more your gamma brain wave amplitude will increase.

Yoga – Again like meditation, yoga is yet another activity that promotes relaxation and wellbeing by shifting your brain waves and increasing your perception of reality. EEG's of yogis have shown that they are able to increase their gamma brain waves to higher than average amounts. Though there are many different types of yoga, if they are practiced correctly, they can all be utilized to increase awareness, and gain valuable insight from within.

Unhealthy Ways to Increase Gamma Brain Waves

There are no known unhealthy activities that increase gamma brain waves. Virtually all activities that are detrimental to mental health decrease the amount of gamma brain wave activity in the brain. Things like general anesthesia, stress, and killing brain cells will decrease your brain's natural production and amount of gamma brain wave activity. As gamma brain wave activity decreases, susceptibility to depression, stress, and unfocused or impulsive thinking may overtake the brain. Now that you have a better understanding of how the frequencies in the brain function and what they do.

UNDERSTANDING YOUR BRAIN - ENDNOTES

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