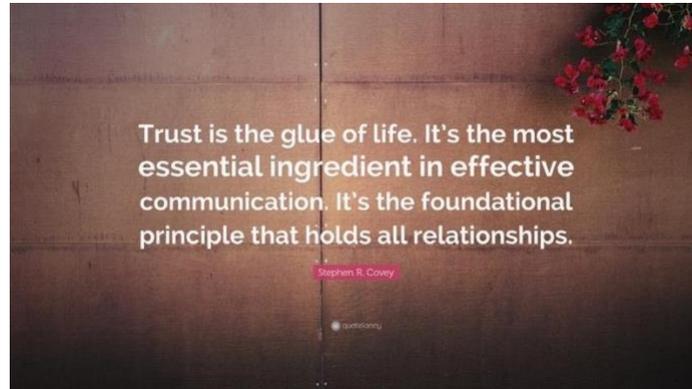


Feeling the Love-Brain Hacking Your Relationships

Lesson by Bryana Williams, M.S. CCC-SLP



<https://quotefancy.com/trust-quotes>

RELATIONSHIPS, one could argue, are the fundamental core of what it means to be human—whether it be with family, friends, or work, none of us would get very far without being able to rely on each other! In fact, our ability to lean on and connect with one another has become so important that it's hard wired into our brains, a natural, NEURAL bias towards trust that leads to fulfilling and engaging interactions with other humans. How, though, does our brain do this, and how can it help us build better relationships? Let's find out!

Spell: FUNDAMENTAL, NEURAL, RELATIONSHIPS

Some consider ____ to be the fundamental core of what it means to be human. (Relationships)
What does “fundamental” mean? (Basic, core, elementary, etc.)

From the lesson, what's an example of a category of people we might rely on? (Family, friends, work)

We are naturally biased towards _____. (Trust)

The quote above states that “trust is the glue of life”. Would you agree? Why or why not?

Your own brain may be your furthest consideration when you are trying to improve your relationships, yet it is the very place that processes what you perceive, understand, remember, evaluate, desire, and, ultimately, how you respond to people. The somewhat bizarre fact of life is that the people in our lives are an interesting mix of who they are and what we make of them in our brains: this INTERPLAY (interaction) between what occurs in our relationships and how our brain interprets it can give us key insights into strengthening our connections with others.

Spell: EVALUATE, INTERPLAY, CONNECTIONS

Your own ___ may not be the first thing you consider when it comes to relationships. (Brain)

What is one thing our brain processes, according to the lesson? (Perception, understanding, memory, evaluation, desires, responses to people)

What synonym did I give for “interaction”? (Interplay)

What does “interplay” mean or refer to? (Interaction, interchange, relationship, etc.)

We can strengthen our ___ with others by understanding our brain. (Connections)

Long story short, our development from infancy to adulthood and beyond is *always* stimulated or KINDLED (inspired) by experiences we have in interactions with other people, other brains. It IS interacting in relationships that stimulates brain structures to activate and mature both on individual and social levels, and EVOLUTIONARY scientists believe that we owe our current brain structure to our social tendencies!

Spell: ADULTHOOD, KINDLED, EVOLUTIONARY

Our ___ is always stimulated by experiences with other people. (Development)

Why are relationships considered so important? (Stimulate our development, may have led to our current brain structure, etc.)

“Kindled” may also mean what? (Inspired)

Can you think of another context where “kindled” might be used? (Building/starting a fire, etc.)

We may owe our brain structure to our ___. (Social tendencies)

In your opinion, what’s an example you can think of a real or hypothetical situation where development is influenced by interaction?

At the social level, it is now HYPOTHESIZED that the need to COMMUNICATE, non-verbally and verbally with fellow members of our clan on the savannah to survive is what drove the phenomenal growth of the CORTEX, in humans – the outer level of GREY MATTER with all of its amazing capacities of empathy, consciousness, planning, language, thinking, and DISCERNMENT (an ability to discriminate or judge). So it’s not just that we have empathy because we have the PRE-FRONTAL CORTEX in our brains, but that we have evolved highly complex brain structures like it because they are developed and matured by empathy. As psychologist LOUIS COZOLINO says, we are not the survival of the fittest; we are the survival of the nurtured.

Spell: CORTEX, PHENOMENAL, EMPATHY

Our need to ___ may have driven the growth of the cortex. (Communicate)

What is the cortex? (Outer level of grey matter)

What is one function of the cortex? (Empathy, consciousness, planning, language, thinking, discernment)

An ability to judge is called what? (Discernment)

What does discernment mean?

What develops and matures the frontal lobe, according to this paragraph? (Empathy)

Louis Cozolino says we are “survival of the nurtured” rather than survival of the fittest. What does this mean to you?

VAKT: The Frontal Lobe in 60 Seconds <https://vimeo.com/190199650>

Of course, developing our “higher brain” did not mean we lost brain areas that had served us previously-alerting us to danger or rewards like food or a mate. Instead, old and new structures work in TANDEM (together): understanding their role alongside the NEOCORTEX (i.e. the most recently evolved part of our cortex) helps reveal why our brain sees and responds to relationships the way that it does. In turn, recognizing this circle of influence between brain and relationships means we can hack the system and improve both!

Spell: TANDEM, RECOGNIZE, INFLUENCE

We did not lose other brain areas when our ___ developed. (Higher brain)

Why do you think we “added on” to our brains rather than discarding “old” parts as we evolved?

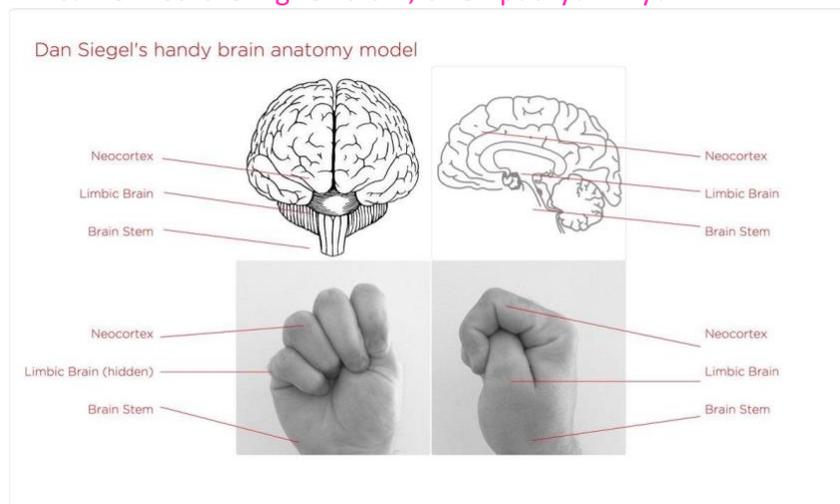
What functions are attributed to some of these older brain regions? (Alerting us to danger/rewards)

What does it mean to work “in tandem”, according to the lesson? (Together)

The most recently evolved part of our brain is the ___. (Neocortex)

What is the neocortex?

What do you think came first: the higher brain, or empathy? Why?



<https://pbs.twimg.com/media/DecIN9YX0AAalgj.jpg>

Let's go over some of these important social brain areas using a hand model of the brain from DAN SIEGEL, a researcher at UCLA who pioneered a field of study termed INTERPERSONAL BIOLOGY. In his model, the arm represents our spinal column, and the wrist our brainstem which controls internal HOMEOSTASIS (equilibrium or balance) of the body (heart rate, respiratory rate, digestion) through the autonomic nervous system (ANS). The ANS has two branches, the SYMPATHETIC (SNS) of arousal and the PARASYMPATHETIC (PNS) of calming.

Spell: INTERPERSONAL, HOMEOSTASIS, NERVOUS

Who developed this particular hand model of the brain? (Dan Siegel)

Who is he? (Researcher at UCLA/pioneered interpersonal biology)

What would you guess interpersonal biology studies or considers?

Where is UCLA? (Los Angeles CA)

What term means balance or equilibrium? (Homeostasis)

Tell me one aspect of homeostasis controlled by the brainstem. (Heart/respiratory rate, digestion)

What system controls the functions of the brainstem? (Autonomic nervous system or ANS)

What does autonomic mean in this context? (Involuntary/unconscious, etc.)

Tell me about the ANS' branches. (SNS arouses, PNS calms)

Based on this, when might your SNS be active?

VAKT: Form your hand into a fist like in the model. Use your other hand to touch your wrist (brainstem) and your arm (spinal cord).

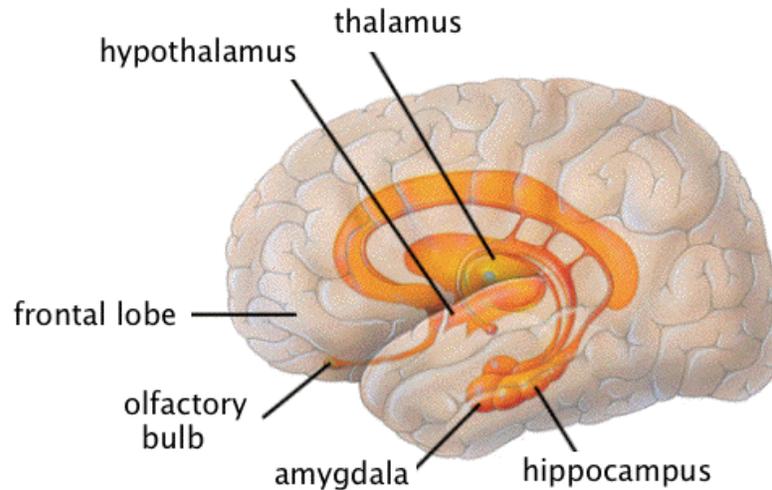
These two are part of the completely unconscious social engagement system that regulates the energy level, or VAGAL tone, of our bodies. Too much SNS and too little PNS, we feel restless, agitated, stressed, all the way to panic attack. Too much PNS and too little SNS, we feel slow, lethargic, numb, all the way to collapsing in a faint. When there is a balanced vagal tone, we are happy campers.

Spell: VAGAL, AGITATED, CAMPERS

Our bodies energy level is also called the what? (Vagal tone)

What's an example of what too much SNS can make us feel? (restless, agitated, stressed, panic attack)

We can feel slow or lethargic when our ___ is too active. (PNS)



Structures of the Limbic System

<https://webspace.ship.edu/cgboer/limbicsystem.html>

Next, each thumb, folded into the palm, represents the mid-brain LIMBIC regions, which includes several structures. The most well-known is of course the almond-shaped AMYGDALA, constantly scanning the environment for threat or danger, even in our sleep. You've likely heard of the amygdala's role in generating our "fight or flight" response, but it goes beyond just being an alarm system: it's also the core of our interactive social processing and the center of our emotional learning!

Spell: AMYGDALA, LIMBIC, INTERACTIVE

What area in the mid-brain do our thumbs represent? (Limbic regions)

What nut is our amygdala shaped like? (Almond)

What does the amygdala do, even in our sleep? (Scans for danger)

What else does the amygdala support besides fight or flight responses? (Social processing/emotional learning)

We normally only hear of the amygdala in terms of its threat "alert" functions. Why do you think it would participate in social/emotional learning?

The amygdala assesses every experience, *including* relational experience, for safety or danger, for pleasure or pain, and pairs each experience with an emotional VALENCE (i.e. attractiveness vs. aversiveness) that makes us approach or avoid similar experiences in the future. The more intense the emotional charge, the more neurons will fire in our brain and the more likely we will REGISTER (or store) the experience in IMPLICIT memory (i.e. memory *outside* of our awareness). Any such experience that is also processed through the

HIPPOCAMPI (paired limbic structures in the temporal lobes near the ears) is translated into explicit memory and, thus, can be consciously recalled.

Spell: VALENCE, NEURONS, IMPLICIT

The amygdala assesses all experience including __ experience. (Relational)

Aversiveness or attractiveness is also called what? (Valence)

What does the assigned emotional valence from our amygdala cause us to do? (Approach or avoid similar situations)

To store memory also means to ___ it. (Register)

What type of memory is outside of our conscious awareness? (Implicit)

What is implicit memory?

Why store memories we can't consciously recall?

What structure must process an experience in order to store it in our conscious memory? (Hippocampus)

Where is the hippocampus? (Limbic system in temporal lobes near ears)

VAKT: Touch near your ears to approximate where the hippocampi are.

This is one of the reasons social or emotional experiences we see as negative can feel as real as physical danger! When we feel safe in relationship, we stay within our window of tolerance and our cortex stays functional. When we don't, the SNS arouses the amygdala to prepare for fight or flight: we can experience this as an emotional HIJACKING (takeover/seizure), our rational self temporarily nowhere to be found. In contrast, a situation that feels life-threatening or overwhelming can lead the PNS to calm everything down to the point of shut down-we go numb and freeze. In either case, our ability to connect with others is compromised.

Spell: TOLERANCE, TEMPORARILY, COMPROMISE

Social experiences we see as ___ can feel as real as physical danger. (Negative)

What is our cortex able to do when we feel safe? (Remain functional, stay tolerant, etc.)

The SNS arouses the amygdala to prepare for what? (Fight or flight)

What's a synonym for "hijacking" used here? (Takeover/seizure)

What can the PNS do in overwhelming circumstances? (Shut us down/numb us out, etc.)

Next up is our HYPOTHALAMUS-located deeper in the limbic system-which releases many different hormones to regulate the two AMYGDALAE. One of the most important is OXYTOCIN – the bonding hormone that is released through touch, warmth and movement. Oxytocin calms the amygdala: this is why hugs or even just *thinking* about a time we felt safe and connected can sometimes make all the difference!

Spell: HYPOTHALAMUS, OXYTOCIN, RELEASED

The ___ releases hormones to regulate the amygdala? (Hypothalamus)

What does the hypothalamus do?

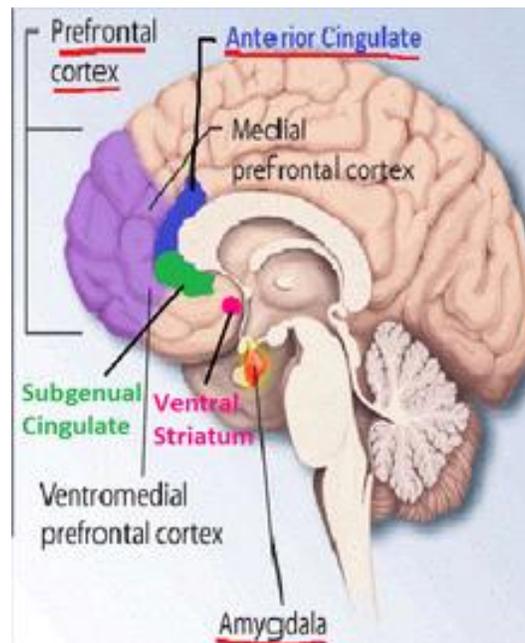
What is the plural of amygdala? (Amygdalae)

Which hormone is known as the bonding hormone? (Oxytocin)

What is oxytocin?

Based on the categories listed above, can you think of your own example of when something can trigger the release of oxytocin? (Hugs, hand holding, exercising, sitting by a fire, etc.)

Oxytocin can be released even if we just think about a feeling of happiness and safety. What do you think might be some implications of this?



The MPFC (Purple) and Anterior Cingulate Cortex (Blue)

https://en.wikipedia.org/wiki/Mechanisms_of_mindfulness_meditation

The last two knuckles of the middle two fingers, curled over the thumb (limbic region), represent a group of structures that form the medial pre-frontal cortex (mPFC)-our social brain, sitting in our frontal lobe! The VENTRAL, MEDIAL, AND ORBITOFRONTAL (i.e. front, middle, and behind the eyes) CORTICES (i.e. outer grey matter) and the ANTERIOR CINGULATE, which focuses attention, are only a few cell layers away from the limbic regions. With the help of oxytocin, the mPFC extends GABA (GAMMA BUTYRIC acid) -bearing fibers down to the amygdala and quells the fear response, allowing us to regulate or override the rapid emotional signaling and response of the amygdala, emotionally regulate, and experience empathy.

Spell: CORTEX, ORBITOFRONTAL, QUELL

What does mPFC stand for? (Medial pre-frontal cortex)

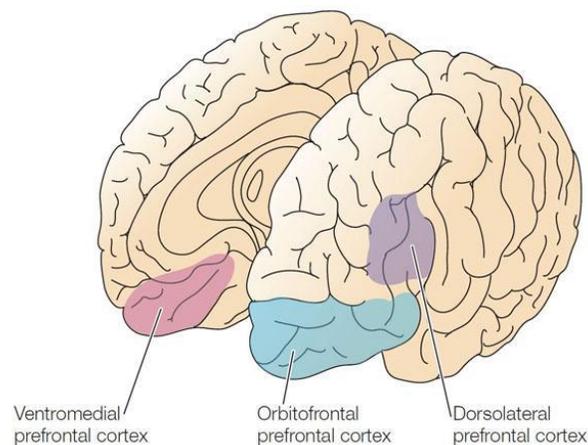
What anatomical term means “front”? (Ventral)

Which means “behind the eyes”? (Orbitofrontal)

What is the cortex or cortices? (Outer level of grey matter)

What does the anterior cingulate do? (Focuses attention)

Describe what the mPFC does in your own words. (Sends fibers to amygdala, manages emotion/allows for empathy, etc.)



Orbitofrontal (Blue) and Dorsolateral (Purple) PFC

<https://appsych-thefrontallobe.weebly.com/structure-and-function.html>

That makes these areas incredibly significant: as AMPLY (copiously/fully) demonstrated in the work of neuropsychologist ALLAN SCHORE, the need for AFFECT (emotional) regulation is what drives ATTACHMENT behaviors-in the psychological model of attachment theory, these are actions and responses that drive the dynamics of interpersonal relationships. When we feel safe in a relationship, our sympathetic nervous system is not aroused and our MPFC stays online: our natural tendency as human beings to move toward remains operative. We engage, we interact, we bond. If we feel safe in relationships-*even when there is a perceived threat or danger*-we can more easily overcome, engage with a safe other to regulate our emotional distress, and continue to move toward.

Spell: AMPLY, OPERATIVE, SYMPATHETIC

What word means “fully”? (AmPLY)

Can you think of an antonym for this word? (Insufficiently, not enough, etc.)

Which neuroscientist demonstrates the importance of regulation in attachment to others?
(Allan Schore)

Affect is another word for _____. (Emotion)

What are attachment behaviors? (Actions/dynamics that drive personal relationships)

What can feeling safe in a relationship help us do? (Overcome fear/regulate ourselves, etc.)

This is the essence of SECURE ATTACHMENT, the knowing that we can rely on another to support us emotionally and keep us safe. As the authors describe it in “Raising a Secure Child”, a secure attachment is a “confidence and trust in the goodness of me, you, us” that a person carries throughout their daily life. It is the sense of being loved and supported no matter what happens that fertilizes our mPFC-limbic connections and develops our ability to emotionally regulate ourselves through stress and discomfort.

Spell: ATTACHMENT, FERTILIZE, DAILY

The knowing that we can rely on each other for safety and emotional support is the essence of what? (Secure attachment)

It helps us regulate ourselves through stress and _____. (Discomfort)

This means we can use our mPFC to practice ATTUNEMENT, or responsiveness to another’s emotional needs, to calm the brain both for ourselves and for the people we are relating to. Recognizing the activity of this amygdala-frontal lobe RESONANCE CIRCUIT guides us in using tools to re-direct it from stress-based responses to those of a regulated, secure, connected brain. The two major TENETS (views or opinions) of building secure attachments are 1) providing support when needed, and 2) offering the freedom to explore when desired. The balance can require practice, but having a few tools in your belt can make the practice easy.

Spell: ATTUNEMENT, RESONANCE, DESIRED

Responsiveness to another’s emotional needs is _____. (Attunement)

What is attunement?

Pretend you are to write the dictionary definition of attunement. How would you describe it?

The feedback loop between the frontal lobe and amygdala is known as a _____. (Resonance circuit)

What term means views of opinions? (Tenets)

What are the two tenets of building secure attachments as described here? (providing support when needed, offering freedom when desired)

First things first, spend time with your regulators! Because our brains are social brains, developing most efficiently in interactions with other brains, it's essential that we hang out with other healthy brains! Researchers have discovered that if one partner in a relationship has a secure attachment style, the other less-than-secure partner can grow into "earned" secure attachment with time and practice thanks to that resonance circuit.

Spell: REGULATORS, INTERACTIONS, SECURE

Spend time with your _____. (Regulators)

Our brains develop most efficiently in _____ with other brains. (Interactions)

One can grow into _____ secure attachment with time and practice. (Earned)

Secondly, take time to get to know yourself and how your resonance circuit is working. Mindfulness, as a process of INTRA (within the self)-personal attunement, uses and strengthens the same resonance circuits that empathy does and develops all nine functions of the PFC (SNS/PNS balance, emotional regulation, attuned communication, response flexibility, empathy, insight, fear extinction, intuition, morality). Mindfulness trains the brain to focus attention on the felt sense of direct experience in the moment with acceptance and compassion. There doesn't have to be any spiritual or TRANSCENDENT (divine, supernatural) overtones to do this, just a conscious effort to check in with the limbic and autonomic systems. There are lots of mindfulness options, some of the most popular being meditation, body scanning, deep breathing, and even just placing the hand over the heart.

Spell: MINDFULNESS, ACCEPTANCE, OVERTONES

A process for intra-personal attunement is _____. (Mindfulness)

What does "intra" mean? (Within the self)

What term, then, means "Between others"? (Inter)

What is one of the nine functions of the PFC?

What do you think "attuned communication" means?

Mindfulness teaches us to focus on experiences with acceptance and _____. (Compassion)

What word means divine or supernatural? (Transcendent)

What, if any, of the mindfulness options appeal to you? Why?

Thirdly, hear each other's expectations and work to meet them. What ultimately matters for trust to emerge is that individuals are meeting the expectations their partners set, thereby freeing them from having to consistently check (i.e. scan for danger, in the amygdala's opinion!). Communication is key!

“Venture into error”. Sometimes despite our best attempts at recognizing each other’s needs or understanding what is happening in another’s brain, we get it wrong: this is ok! A neurologist, Rick MENDIUS suggested so much of what we are learning about the brain is so new, so tip of the iceberg, that we have to be comfortable “venturing into error”-getting things wrong-when we talk about or practice strategies. Give yourselves empathy by venturing into error together.

Spell: VENTURE, COMMUNICATION, STRATEGIES

According to our lesson, it’s important to set __ and work to meet them. (Expectations)

Meeting expectations can allow us to build _____. (Trust)

What does it mean to “Venture into error”? (Make mistakes/get wrong, etc.)

Why does Rick Mendius think we need to be willing to do this when it comes to the brain? (It’s still new/we’re still learning, etc.)

When you do venture into error, practice keeping and building trust with and overcoming the “noise” with a strategy called “generous tit for tat”. In any relationship, trust will eventually be broken and expectations may not be met, most often on accident. Using empathy to recognize that slights were likely unintentional and choosing to stay engaged rather than retaliate or pull away can- you guessed it-alleviate our fears and build our self-regulating brain connections.

Spell: NOISE, GENEROUS, ALLEVIATE

What strategy can help overcome “noise” in relationships? (Generous tit for tat)

Most often, expectations are missed on _____. (Accident)

We have a choice to stay _____ rather than retaliate or pull away. (Engaged)

The take away here is that our brain is a social brain, a fact that works to our favor! Experiences in relationship are the most powerful interventions we have to harness that neural plasticity to help us fire and re-wire neurons in new ways. Here’s to brain hacking for our best connections!

Creative Writing:

1. What would your top tenet be when it comes to building positive relationships?
2. We all have social brains that draw us to seek connection. What kind of socializing does your brain like to do?

Resources:

<https://www.brainpickings.org/2014/02/03/david-desteno-truth-about-trust/>

<https://www.sciencedaily.com/releases/2008/05/080521120511.htm>

<https://www.health.harvard.edu/blog/brain-science-to-improve-your-relationships-2018100414922>

<https://lindagraham-mft.net/the-neuroscience-of-attachment/>

https://greatergood.berkeley.edu/article/item/how_to_cultivate_a_secure_attachment_with_your_child