




The Social Brain: Why No Brain Heals Alone



A Webinar Session with
Ruth Buczynski, PhD
and Louis Cozolino, PhD



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The Social Brain: Why No Brain Heals Alone

with Ruth Buczynski, PhD
and Louis Cozolino, PhD

Dr. Buczynski: Hello everyone and welcome.

I'm Dr. Ruth Buczynski a licensed psychologist in the State of Connecticut and the President of the *National Institute for the Clinical Application of Behavioral Medicine*.

I'm so glad that you're here tonight. We're here with someone who has been studying the brain for a very long time, leading the way in areas of applying brain study to the real world. I'm talking about my friend Lou Cozolino.

He is a Professor of Psychology at Pepperdine University as well as a private practitioner. He has degrees in philosophy and theology from Harvard and also from the State University of New York. He earned his degree in Clinical Psychology from UCLA.

He's the author of many, many books. But a couple of my favorites are the *Neuroscience of Psychotherapy*, *The Making of a Therapist*, *The Neuroscience of Human Relationships*, and now his newest book, *The Social Neuroscience of Education*.

This is the book that we're going to make sure educators and parents see.

Tonight we're going to be talking predominately about learning. Learning is important, obviously in school, and as a lifelong process.

But if you think about it, learning is more than that – it goes on in getting over depression, it goes on in relationships, whether they're intimate relationships or interpersonal relationships.

It's really important to be good at learning. So, Lou, thanks for being here. It's good to see you again. It's been a little while since you've done a webinar with us.

Dr. Cozolino: Thank you, Ruth. It's been about a year.

The Brain as a Social Organ

Dr. Buczynski: Let's get started. You say that to change the way we learn, we need to think about the brain as a social organ. Can you back that up? Why do we need to think of the brain as a social organ?

Dr. Cozolino: One of the major issues that we miss in modern science, because we study individual organisms, is we forget the fact that organisms evolve to survive and optimize their survival.

“There was a tipping point in human evolution...when being joined together and being interconnected with one another became a preferred survival strategy.”

There was a tipping point, at least in human evolution, at some time in our distant past when being joined together and being interconnected with one another became a preferred survival strategy.

Over eons, our brains and our bodies have evolved and changed shape and function. We're woven together through empathy, through communication, and through imitation, in ways that need us to look at who we are in context if we want to understand the brain.

There's no such thing in nature as an isolated, human brain. In order to understand the human brain, we have to think of it as being connected in a matrix of other brains, a part of a group mind that we call family, tribe, culture, society...

The Social Synapse

Dr. Buczynski: Now you also have a concept that you refer to as the social synapse. Can you explain what you mean by that?

Dr. Cozolino: Sure. When we look at the evolution of brain development – the evolution of primates, mammals, and all social animals – we see this parallel process of evolution when we're looking at groups of animals and when we're looking at groups of neurons.

“Neurons wired together stimulate each other, and they're organized to optimize functioning.”

Neurons wired together stimulate each other, and they're organized to optimize functioning. That same process is happening at a much more complex level when it comes to people connecting to one another.

I use the term social synapse to examine in depth the complexity and the bandwidth of communication between people, some conscious and a lot of it unconscious (facial gestures, body movement, pupil dilation, blushing). I also examine the morphological changes in our bodies and our internal nervous system so that we provide each other with more information about our internal states.

Dr. Buczynski: With morphological changes, are you talking about some part of evolution...?

Dr. Cozolino: Let's look at it this way. I know we've all spent a lot of time with chimps and monkeys.

If you've seen them, one thing you notice is that there's not much color differentiation between their pupil and their sclera, that white part around the eyes. What you see is this huge leap in the morphology of just the eye alone.

We provide each other all sorts of information just by the direction of eye gaze, which is why poker players wear sunglasses and have hats tilted down because they don't want to give *tells* (changes in their demeanor or behavior).

When we reach this point of being social creatures, we have these automatic ways that we *out* each other – through direction of gaze, through pupil dilation, through blushing – really all sorts of social signals.

When I talk about the social synapse and parallels to neural synapses, we're talking about the many bio-chemicals and neural hormones, all of which influence neural transmission.

“When we reach this point of being social creatures, we have these automatic ways that we out each other...”

Now, we know that the glial cells that surround synapses also influence the neural transmission.

“The more sophisticated we become at reading other people, the more connectivity we experience.”

There are scores of obvious and, more importantly, subtle, ways in which we’re communicating to each other – where we’re getting a sense of what’s going on inside of the other person. The more sophisticated we become at *reading* other people, the more connectivity we experience.

Clinicians specialize in this and parents are becoming better at this as well.

The more parents become sophisticated in being able to read their child’s inner state by their facial expressions, by their postures, by their body movement, the more they allow for increasing the sense of connectivity.

That’s what I mean when I talk about the social synapse – that space between us that’s so full of information and we take it so much for granted that we hardly ever notice that it’s even there.

Dr. Buczynski: What about people who really can’t read any of that information? What about those with autism?

Dr. Cozolino: There, the neural networks that are dedicated to reading signals are very often underperforming or nonfunctional, especially in severely autistic people.

In another direction, we have sociopaths or psychopaths who have the networks to read the signals, but they don’t have the empathic attunement to feel like they’re part of the group.

“The social synapse is the space between us that’s so full of information and we take so much for granted...”

They just use that information to manipulate other people – to suffer the anticipatory anxiety or the pain of other people who are experiencing.

How Lessons from the Social Brain Translate to Learning

Dr. Buczynski: How do the lessons we’ve learned about the social brain translate into the learning process?

Dr. Cozolino: One of the starting points is when we think about institutionalized education – an educational system designed on a mass production, Henry Ford model of disseminating information.

But humans didn’t evolve that way. Humans evolved in groups of 50 to 100, maybe 125 individuals where the teachers were related to the students.

“All the knowledge that was being learned was part of mutual survival.”

All of the knowledge that was being learned was part of mutual survival. The children were being taught by the elders, and those elders would eventually become dependent on those young people, their students who grew older and had matured.

There was this emotional bond, and the biochemistry of attachment evolved to be interwoven with the biochemistry of learning.

Those things that create secure attachments also enhance neuroplasticity and learning. When you create education as an institution and you make it into an assembly line, the quality and value of education gets eclipsed by the pedagogy of information transfer.

That's not so bad for children who have good homes or are securely attached and whose families buy into the values of education, because they get that at home.

“When you create education as an assembly line, the quality and value gets eclipsed by the pedagogy of information transfer.”

“...the biochemistry of attachment evolved to be interwoven with the biochemistry of learning.”

But for the most part, we have schools that are failing with children who don't necessarily have one or more of those variables.

These are children who may not have families that nurture them or have secure attachments. They may not be able to hook into the group-mind, and they may not get the types of relationships they need to stimulate neuroplasticity.

Relationships: The Key to Rebuilding the Brain

Dr. Buczynski: You talk about in your book how relationships are usually the key to opening a closed mind or to rebuilding the brain. Can you lay out the foundation of that?

Dr. Cozolino: When I think about that, there are two situations in my experience where I've heard about “unteachable students.”

One was in the neurology departments where children had such severe brain damage that the idea was that they weren't capable of learning.

The other context is usually in inner city schools with minority students where teachers deem these students as “unteachable,” so I'm talking more about the latter group obviously than the former group.

But my belief about this is if you have a traumatized child – either through direct trauma or through neglect or lack of support or because of insecure situations, day-to-day community violence, perhaps drug violence or drug use at home, or just through the unavailability of preoccupied parents or parents with psychopathology – you're creating a brain that has high stress levels.

We see such high levels of cortisol, for example, that protein synthesis is inhibited. The hippocampus, which is key to new learning, becomes smaller as a safety device to protect itself from all of this cortisol.

We get children whose brains are turned off to learning and then they develop a behavioral and psychological attitude where they feel they're not loved, they're not cared for. They feel that they have to protect themselves from incoming information because so much of the information they've received has not been in their best interest.

“...if you have a traumatized child... you're creating a brain that has high stress levels.”

They go into school and they're sitting in a classroom with a teacher, perhaps of a different race or culture, and certainly of a different age, where they're already shut down biologically, psychologically, and emotionally to learning.

“The key to getting these children *turned on* again is through secure attachment... which down regulates anxiety and allows them to *buy into* the tribe.”

The key to getting these children *turned on* again is through attachment – secure attachment and through love, which down regulates anxiety and allows them to *buy into* the tribe – into the values of the school and of the community.

This is where they can have an idea of a future – that what they're learning has some meaning just like it's had through eons of evolution. Historically, we didn't learn random things.

Dr. Buczynski: You're talking about love and attachment. Is this more of a theoretical position or is there research to back this up?

Dr. Cozolino: The research is connected through the biochemistry primarily.

We know that when people have positive emotional connections with each other, they have higher levels of serotonin, dopamine, and oxytocin.

All of these different biochemicals down regulate anxiety.

These biochemicals regulate cortisol production, enhance neuroplasticity, and make for healthier learning systems.

It's not just a nice *Los Angeles Fufu* idea. We have the mechanism of the action – we can see the result of their power. For example, how does love get translated into psychological health and learning and well-being? We know that now. It's not theology or philosophy anymore.

“We know that when people have positive emotional connections with each other, they have higher levels of serotonin, dopamine, and oxytocin.”

The Impact of Stress on Learning

Dr. Buczynski: Let's talk about stress. We're saying that high stress impacts learning. What's the research behind that?

Dr. Cozolino: It is the same biochemistry: the more stress you have, the higher your levels of stress hormones, particularly cortisol.

First, cortisol inhibits protein synthesis. This means that cortisol doesn't allow neurons to grow new dendrites which are essential to learning.

“Cortisol doesn't allow neurons to grow new dendrites which are essential to learning.”

Cortisol also leads to hyper activation of the amygdala functioning. Moderate to high levels of amygdala activity actually inhibit hippocampal processing.

At low levels and at very high levels of arousal, we are either unmotivated or the brain doesn't get activated to learn, or we're too frightened and too agitated to learn. Historically, we know that it's no

time to learn something new; it's the time to get to safety or to fight – the flight-fight activation.

From mild to moderate levels of stress, there's an optimal level of amygdala activation, which stimulates hippocampal activation, and this results in learning.

Some researchers talk about amygdala activation as flow. Others talk about it as learning, as an optimal arousal level.

“From mild to moderate levels of stress...amygdala activation stimulates the hippocampus and results in learning.”

But the research was originally done in 1908 by Yerkes and Dodson where they discovered this inverted new curve of learning, and you can plot directly the biochemistry of neuroplasticity onto that learning curve. They were really measuring hippocampal activation, but they didn't know that – they were just looking at how animals learned in stressful environments.

Dr. Buczynski: We know that too much stress shrinks the hippocampus and the hippocampus is so critical for learning and processing of information.

We've talked about the importance of secure attachments, and we've talked about the importance of optimal levels of stress. You're not really pushing no stress at all...is that right?

Dr. Cozolino: Basically, that's when the brain goes to sleep. That's like watching television on a Sunday afternoon.

Dr. Buczynski: Right. Once the brain is turned off, what does it take to turn it back on? A lot of our practitioners might be school nurses; they might be physicians in a general practice where they see all kinds of people, including children that come from high stress environments.

What would they be recommending? What would be important for them to think about?

Dr. Cozolino: I remember years ago someone telling me that when you study psychology long enough, what you discover is what your grandmother told you when you were four or five.

What I've found with both famous teachers, who have been very successful and lauded, and also from the teachers that I know who've worked in public and private school systems, is that they have the instinct – they have the maternal and paternal instinct to care for the children that they're teaching.

It's not that we just have students who get turned off to learning; it's that we have teachers who get turned off to relationships.

“We have students who get turned off to learning and teachers who get turned off to relationships.”

Often, teachers are idealistic – they come into the field and they get overwhelmed and burned out by the system, by the stress, and by the lack of support.

I don't think of myself as an expert teacher, but this is what I've learned from the good teachers who I think are experts.

I've learned from them what works and how it works. Pretty much, they integrate their love for children (or for students) with the pedagogy. Somehow they are able to do that.

They haven't themselves gotten turned off, and they haven't gotten this personal-professional split that leads them to be one person at home and another person at work.

They are integrated as a human being and they bring that into the classroom.

A lot of teachers say it's unprofessional to express emotion or to get overly involved, and I hear the same thing of therapists, and we've had a lot of training in law and ethics about boundaries...

“Good teachers integrate their love for children...with the pedagogy.”

But there's also this grey area when we think about ourselves as social beings. The professionalization of teaching and therapy might actually be working against us in some ways as far as using the leverage that we have in helping people to change.

How Experience Builds the Brain

Dr. Buczynski: I want to switch tacks for just a minute, and this is going to all come together everyone. How does experience build the brain...early in life and as a child?

“As you go up to the midbrain and the cortex, there's less and less established, and more and more shaped by experiences.”

Dr. Cozolino: Through the cortex primarily...When you think about the brain, there aren't really clear layers of the brain like the triune model that's so popular.

But you can use that as a metaphor – a heuristic. The further down the brain – the more primitive brain, it is much more established during gestation.

As you go up to the midbrain and the cortex, there's less and less established, and more and more shaped by experience.

What this does is it optimizes our ability to have a brain that shapes to the environment. The cortex is largely potential at birth. Structures like the amygdala are fully mature at about eight months of gestation.

So for example, a child a month before birth is capable of being totally terrified physiologically, but it takes years for children to develop a cortical mass or the cortical structures that allow them to regulate their affect.

That really is what the process of attachment is all about. When you look at the research of John Bowlby, Mary Main, and Mary Ainsworth, we see that attachment is the ability of the child to use the parent as an external neural circuit – using the parent through proximity to regulate autonomic arousal.

“...attachment is the ability of the child to use the parent as an external neural circuit...”

It's this relationship that gets wired into these descending circuits – from the prefrontal cortex down to the midbrain, the amygdala and to other regions – that becomes our ability to auto-regulate our affect.

When you look at the research, both human and animal research, you see how *love becomes flesh*. Early attachment relationships build this one particular circuit that's prefrontal to the amygdala and biased toward the right hemisphere.

“People who have negative childhoods can have experiences that reshape circuits to allow them to have better outcomes in adulthood.”

This circuit shapes us and allows us to inhibit arousal and fear, which correlates with better functioning, less psychopathology, less stress, greater ego strength – whatever your conceptual model is.

So we have 100 years of research that demonstrates the relationship between the nurturance of childhood and well-being of adulthood, and now we understand more about the mechanism of that action.

The brain is an organ of adaptation, especially the cortex; it changes and it also can readapt. People who have negative childhoods can have experiences that reshape circuits to allow them to have better outcomes in adulthood.

Conversely, children who have very good childhoods can experience enough stress during adolescence and adulthood to have an outcome that looks like they had a very negative childhood.

“Attachment circuitry remains plastic throughout life.”

The brain continues to remain plastic because historically, environments change. Let's take attachment, for example...you don't want attachment circuitry to shutdown at 20 because then you wouldn't have fallen in love with your grandchildren – now that wouldn't be very good.

Attachment circuitry remains plastic throughout life.

How Experience Affects Epigenetics

Dr. Buczynski: Looking at experience and building the brain, can we talk a little bit about epigenetics and how experience affects epigenetics?

Dr. Cozolino: There were three main areas from the research of parenting. Most of this is from the animal research by necessity because we have to sacrifice the subjects.

We know what happens the more maternal attention a pup receives, and it comes out to about 20 or so different biological processes.

“Pups that receive more maternal attention will have more cortisol receptors in the hippocampus.”

The research work is done measuring the amount of time a mother spends licking and grooming their pups, retrieving them into the nest when they roll out, and feeding them.

You find that pups that receive more maternal attention will have more cortisol receptors in the hippocampus. Now, that means that lower cortisol will stimulate feedback receptors to shutdown cortisol production, and that results in lower resting levels of cortisol.

Rats that have more maternal attention have more endorphin receptors in the amygdala. We have endorphins in our system – when we’re stressed out or when we exercise, or whatever, they’re secreted, and they inhibit arousal and anxiety.

So then, this is the epigenetic phenomena where love becomes flesh – where the relationship gets transferred to the neural biological structure of the brain.

It seems that there are three categories of epigenetic phenomena that the brain specializes in. One is arousal regulation, the other is learning and memory – this increased plasticity, and the other is more attention to relationships as adults.

“The three main categories of epigenetic phenomena are arousal regulation, learning and memory, and maternal behavior.”

The children that receive attention have more invested and more activity so when they have their own children, they invest more into their children.

So, those are the three main categories: arousal regulation, learning and memory, and maternal behavior or relationship behavior later in life...

Dr. Buczynski: While we’re on this, because I’m sure someone’s going to want to ask you this: Do you think there’s any reason why it couldn’t be fatherly love versus motherly love? Is there anything innate? Does it need to be a positive bond with the mothers, as long as it’s a positive bond with the caregiver, the parent?

Dr. Cozolino: That’s an interesting question. Here’s the basic answer: women have been shaped by evolution to be more sensitive, more attuned and more invested in relationships as a group. Of course, there are women who are far worse at that than some men are.

There’s an interesting finding by a fellow named John Allman, a primatologist among other things at Cal-Tech, who looked at different species of primates. He found that in the species where the mother does most of the infant caretaking, their life expectancy was much longer, just as in humans, for example.

But there are some species of monkeys where the female has the baby, immediately hands it over to the husband or the male, and the male raises the infant. In those species, the male has a longer life expectancy.

“Women have been shaped by evolution to be more sensitive, more attuned, and more invested in relationships as a group.”

There are different theories to explain it, but one of the theories is that taking care of children is salubrious to our health. There’s the biochemistry of reward that actually makes our brains and body function better over the long haul.

“...taking care of children is salubrious to our health.”

A complex way to answer this, at least in humans, is that women have been selected. Their brains and bodies are different than men.

On the whole, women are much better at relationship behavior than men. But that doesn’t mean that a sensitive, caring attuned man wouldn’t be able to raise a very healthy, well balanced child.

Dr. Buczynski: As you said before, not all women *are* better at it...and not *all* men are bad at it.

If we think about evolution, even just in the time that you and I have been adults, which for me has been quite awhile, caretaking has changed an awful lot. Fathers take more of an active part in child rearing.

I read a study recently, maybe it was a year ago now, saying that father's taking a more active part is particularly true among people of higher socio-economic income and higher education than among those of lower incomes and education....

At any rate, the whole idea that experience turns on and off genes – the whole concept of epigenetics – is critical when we think about learning and change.

“The whole concept of epigenetics is critical when we think about learning and change.”

Dr. Cozolino: Right. The model for education is primarily one of information induction. It doesn't really account for what stimulates those genetic processes to occur and to grow the brain.

That's when you start to look at the hundreds of neural educational books, maybe thousands by now...I look at them all the time.

In one way or another, all these books are looking at the findings in neuroplasticity of the isolated brain...

“The more we realize that we're animals and embodied, the more we're going to learn about how our brains work.”

how you can change the temperature of the classroom, or you can change the sleeping patterns of children, or you can change the way information is presented or how it is clustered, but in all of that I haven't found one yet that takes into account the importance of relationship.

But I am finding this is in the work Jared Diamond and E.O. Wilson who are cultural anthropologists.

They are looking at animal studies and they're learning more about humans through animals.

Animals give us a window into ourselves that circumvents our ego and pride at being at the top of the theoretical hierarchy of beings. The more we realize that we're animals, and the more we realize we're embodied, the more we're going to learn about how our brains work.

The Impact of Storytelling on the Brain

Dr. Buczynski: Let's talk about storytelling. What impact does storytelling have on the brain?

Dr. Cozolino: Storytelling is incredibly important because, for most of human history since the emergence of language, we've had an oral tradition. There are many cultures that are still in their oral traditions.

In terms of this very complex interwoven process, we have societies getting larger, groups of people growing. We have brains growing simultaneously.

There's a high positive correlation between brain size and the complexity of the social culture that an animal lives in. It takes a lot more brain power to deal with all the subtleties of relationship than it does to deal with surviving an environment.

We see this complex development, and as that's gone on, the brain has gotten more intricate and more complicated. The brain is not a monolithic structure.

The brain is this complex government of systems...where right and left hemispheres are highly specialized. We have very, very specialized systems. For example, one network in our brain just processes right side of faces.

“It takes a lot more brain power to deal with all the subtleties of relationship.”

“The more diversity among brain systems, the greater the requirement for the integration.”

We have these very, very specific systems. The more divergence and diversity among brain systems, the greater the requirement is for the integration of these systems.

Some of that is internalized in executive processing, but as society and communication have become more complex, and social relationships have become more central, some of this integrative work has been offloaded into the group mind in the form of stories.

We have stories that we constantly share with each other that serve to integrate our brains and to remind us of who we are. Stories establish our role and culture.

Stories are also the repositories of social learning. Through stories, culture passes its social learning through the generations. Stories play many, many roles, both for the brain and for society at large.

“Stories are the repositories of social learning.”

Elements of a Good Story and Neural Integration

Dr. Buczynski: You wrote in your book about the elements of a good story. Let's go through that and talk about both the elements of a good story and how these elements affect neural integration.

Dr. Cozolino: The most basic idea and the key to all of this has to do with the fact that our right and left hemispheres have diverged pretty significantly in the last 20,000 or 30,000 years.

The brain needed to get larger and more complex. The way evolution dealt with that was to evolve beyond the redundant hemispheres that most other animals have. For example, fish and birds sleep one hemisphere at a time because they're basically just going back and forth using one or the other.

But human heads got to a certain size where if they got any bigger we'd probably kill our mothers during birth. I've never heard a woman tell me they wanted a child with a larger head while they were giving birth! So we've pretty much maxed out in that way.

One evolutionary change has been that we're born much more prematurely now – compared to other primates we're born about three months early.

“...we have a fourth trimester that occurs in those first three months of life...”

We have a fourth trimester. I hope that doesn't upset the mathematicians, but we have a fourth trimester that occurs in those first three months of life that requires women to become much more regressed and connected to this very primitive level of communication.

Instead of developing redundant neural topography between right and left hemispheres, these halves become more and more differentiated.

The right hemisphere specializes in emotion (in very high levels of arousal – terror and in very low levels of arousal – shame) and is much more connected with the body. The right hemisphere is specialized in things like visual spatial processing.

The left hemisphere on the other hand is specialized more with sequential processing and logic and language – where the generic beliefs seem to be holding up.

A story is a linear sequence of events (except in Tarantino films) but stories are generally a linear series of events that have some emotional core. There's an emotional struggle.

If I give you a series of events of my day, but nothing particularly interesting happens, you're not going to want to hear the story. But if I run into conflict, if I get in my car and there's an alligator in my car, that's what becomes interesting. That becomes the story, and that's the right hemisphere.

“...stories are generally a linear series of events that have some emotional core.”

The prototypic narrative, at a very fundamental level, integrates the time and sequencing of a left hemisphere and the space and the emotion of a right hemisphere.

Stories help to constantly keep our right and left hemispheres interacting and integrated with one another.

“Stories help to constantly keep our right and left hemispheres interacting and integrated with one another.”

Now, at another level, there's the narrative that we're probably all familiar with, which is the narrative of the hero. It's the person who has some inner conflict and some external conflict, or external challenge, and it's really classically the struggle to go from adolescence into adulthood.

You see this narrative of the hero in – and I love these films – *A Few Good Men* with Tom Cruise facing Jack Nicholson on the stand. That's the “you can't handle the truth” speech.

Then, there's Richard Gere in *Pretty Woman* learning to get over money so that he can find love.

Both of these men had troubled relationships with their fathers. A lot of these narratives are the classic male narratives of going from adolescence to adulthood.

Fortunately, we have wonderful people like Carol Gilligan who has shown us that this narrative is somewhat different for women – the narrative is about relationship, connection, and an expansion of those connections.

“...for women, the narrative is about relationship, connection, and an expansion of these connections.”

There's a wonderful new movie out, a Pixar film (2012) called *Brave* which is all about this young girl whose heroic journey into adulthood involves the resolution of her conflict with her mother. There is no Prince Charming to save her or the mother. The mother and the daughter save each other.

It's very much in line within a different voice and the work of Carol Gilligan.

The narratives don't have to be male narratives, but the narrative serves as a blueprint for development and growth.

“The narrative serves as a blueprint for development and growth...and provides optimism.”

My favorite one is *The Little Engine That Could* and that is one we all pretty much know from childhood where this little train with a bunch of toys and candy wants to get over a hill so that they can take care of the children.

The little train says, “I don't know if I can. I've never done that. I just work around the yard here moving things around.” But they pile in and the train says, “I think I can...I think I can”. When she

reaches the top of the hill and goes over the top she says, “Oh I knew I could...I knew I could.”

That's in the moment – the memory of that narrative through time is captured when you're saying, “I think I can...”

You also embody the ending, “I knew I could.” The narrative provides optimism. These stories and narratives are incredibly valuable and important. That's why they're so essential to our lives.

How the Narrative Activates the Brain

Dr. Buczynski: Now, what's happening in the brain with the narrative? You were writing in your book about how it activates the frontal functioning, which then down regulates the amygdala.

Dr. Cozolino: It seems that either telling stories or writing our stories, speaking them or journaling them or how ever we get them out, activates, integrates, and builds the prefrontal cortical parietal structures that allow us to have an internal imaginative reality. We can use these pictures of ourselves.

Some of us in meditation create a safe room that we go to –retreat to – in times of stress.

This is one of the ways we differ from other primates. We have these very highly developed inferior right parietal areas that allow us to internalize images and manipulate them in our minds.

We can do this and rebuild the sense of self in these regions. We can build a sense of self disconnected from the environment; we can create other options and opportunities and envision different outcomes.

All of this cortical processing in turn builds descending inhibitory and regulatory function to the midbrain, to our emotions.

“We have these very highly developed inferior right parietal areas that allow us to internalize images and manipulate them in our minds.”

Creating a Story to Help Children Learn

Dr. Buczynski: How do we create a story that helps children learn?

Dr. Cozolino: I guess it really depends on the children. The one person who I really admire is a woman named Erin Gruwell who taught in Long Beach, California.

She was the new teacher and, of course, they gave her all the adolescents, the “unteachable” students that the other teachers had given up on.

She was trying to teach them from the syllabus – the curriculum – that she was given.

But these kids were missing school – their best friends or their relatives had been shot and they were going to funerals, or they were hiding out from drug dealers, or it was too dangerous for them to get home from school, or there was no quiet place to study at night.

She realized that these kids were really struggling just to survive. The turning point for her was when one of the kids was making fun of someone with a large nose and drew a picture of that person.

It reminded her of the Nazi propaganda against the Jews in World War II. So, she started teaching about the Holocaust. She started having the children learn stories from the Holocaust, reading the *Diary of Anne Frank* for example, and then, she had the children write their own stories.

She helped her students make their lives meaningful. They weren’t just victims; they were people who were trying to make sense of their own lives. They were developing narratives that could potentially have a different outcome.

These kids were great. They connected with a woman who had hidden Anne Frank in her attic, and they raised the money to get her to come and speak to the class.

They went to the Museum of Tolerance and they learned about the Civil Rights Movement. They developed the Freedom Writers (instead of the Freedom Riders).

They started journaling and publishing their journals. Then, Gruwell did another wonderful thing. Because no one else wanted these students as 10th, 11th, or 12th graders, she talked the administration into letting her teach these kids right through high school.

“...she had the children write their own stories to make their lives meaningful. They were developing narratives that could potentially have a different outcome.”

“She built a tribe and she used the classroom as the tribal family to support all of these kids...”

She built a tribe and she used the classroom as the tribal family to support all of these kids, many of whom didn’t have that kind of support outside of school.

Maybe even a simple administrative change where teachers are trained to teach kids or to have a consistent group of students right through high school, especially in these neighborhoods, might make a world of difference in their ability to improve the learning and help the brain “stay plastic.”

Dr. Buczynski: A little bit about what you’re seeing is that stories help the brain develop coherence, and perhaps bring a left and a right side together in an understanding, both of a feeling and of a narrative...

Dr. Cozolino: Once you have a narrative, narratives can be edited. You can have metacognition about narratives.

On the other hand, when you're living in your life and you just go about your life day-to-day as an effect of the environment, you may not have any tools to change it.

When you have a narrative, you have imagination, you have editing capacity, you have veto power, and you can actually envision new futures.

“When you have a narrative, you have imagination, you have editing capacity, you have veto power, and you can actually envision new futures.”

The Effects of Shame on the Brain

Dr. Buczynski: Let's talk about shame and neural events. How does shame affect neural events and how does shame affect learning?

Dr. Cozolino: First, I should begin by differentiating the aspects of shame. There's the kind of everyday, normal shame. You do something and it's selfish or it's hurtful to someone else and you're ashamed of yourself, so you go and apologize and try to make amends.

That kind of shame is a social emotion that has probably been very important in the evolution of groups. It's a way of making people accountable to each other.

That's not really problematic. In fact, that social emotion is probably good.

What is problematic and what we see a lot in psychotherapy is what I call *core shame*.

Core shame seems to get shaped and developed at a very, very early age, maybe in the first six months to the first year of life. It's preverbal and it's non-conscious. My suspicion is that it has something to do with the feeling that you *haven't been incorporated into your parents* in some way.

I'm not talking about that in a psychoanalytic way. I'm thinking of this in terms of when a child looks into their parents eyes and a child experiences at a very primitive level that they are part of the parent – that they're adored, brought in, and that the parent is completely there for them – my suspicion is that experience leads the child into feeling like they are a part of the tribe.

“When children look into their parents' eyes and experience at a very primitive level that they are part of the parent...they feel safe.”

Now, when they're a part of the tribe, they feel safe and they feel worthwhile.

If you don't get that feeling from your parents, and it can be either because your parent isn't connecting with you or you might have some internal affect regulatory process based on bad genes...whatever it is doesn't allow you to feel safe with your parents.

You have those first six months to a year of life where you don't feel like you've been internalized or incorporated. You don't feel like you're a safe and secure member of the group, and there's this sense of *core badness*.

This isn't a feeling of "I've done something wrong." This is a feeling of, "I'm not loveable, I'm not acceptable, I'm a fraud, and I'm going to be found out."

There's nothing you can do to make up for it because it isn't related to anything you've done or you can remember doing. It really **is** based on this early unconscious right hemisphere embodiment of not feeling connected and safe. That's my general idea of it.

"...core badness...is based on this early unconscious right hemisphere embodiment of not feeling connected and safe."

Alan Shore in his work has looked at this a lot – this right hemisphere process related to shame, and he moves it in the direction of psychoanalysis.

If you're interested in that, you might want to read Alan's work to explore his ideas about that in more depth. I'm thinking of this more in the tradition of Sylvan Tompkins and Gershen Kaufman. The clinical phenomenon of shame is something we see a lot...

Also, I see it a lot in adults who are abused as children who internalize the sense of badness. They end up doing bad things, which creates the congruence between their self-image and their behavior.

It's almost a way to master identifying with the negative – a lot of tattoos, hanging out with the wrong people, being in a drug culture, and that seems to be a coherent with their early experiences.

Dr. Buczynski: In your book, you talk about another teacher who organized a school to counteract shame. Can you tell us about Marva Collins?

Dr. Cozolino: She's a wonderful, wonderful woman, who was a public school teacher in Chicago. After awhile, she was just so tired of seeing children fail or labeled as "unteachable" that she quit her job and took her pension fund.

She lived in this tenement in Chicago, and with the help of her husband, they cleared out the top floor, borrowed desks, got donations, and started her own school.

The piece of it this that stands out for me is her attitude toward her students: if they weren't learning it was because they hadn't learned to love themselves.

She decided that it was her job to love them until they learned to love themselves...until they cared enough about themselves to bother learning.

"...she really was a modern matriarch who created her own tribe."

It was such an inspiration – she really was a modern matriarch who created her own tribe. She saved a lot of these children from just being casualties of the system and negative statistics.

Dr. Buczynski: Yet, along with that, she held to the concept of high standards. One way of not shaming people is to always tell them that whatever they do is good, even if they got the wrong answers.

But she focused on having high standards and high expectations. Can you talk about that some?

Dr. Cozolino: The key piece of that for me is that traditionally, learning was a matter of life and death, and we learned through people because we were banded together for survival.

The value system now of applauding everything takes that away. I think children need to be given worthy challenges, held to high standards, and given the support they need to succeed. That's one piece of it.

“Children need to be given worthy challenges, held to high standards, and given the support they need to succeed.”

The other piece is to think about the success of a tribe. Tribes don't succeed if you have 50 or 75 or 100 people and you expect exactly the same output from everyone.

A tribe's success comes with learning about people's strengths and learning about their weaknesses. You tailor their contributions to the tribe according to their strengths.

That's another important part of high standards. You can have high standards, but if you require people to do things that they're not capable of doing, then you're just creating shame.

So, it's a combination of good assessment – evaluating what people are capable of and maybe setting the bar slightly ahead of what they think they're capable of – and giving them all the support you possibly can.

Then, they can have those moments of achieving beyond what they thought they were capable of. Once you reach something or learn something that you couldn't do before, it edits the narrative.

You're no longer a person that's confined to other people's expectations, or even to your own expectations. There's now a window of possibility.

“Once you reach or learn something you couldn't do before, it edits the narrative. There's now a window of possibility.”

The Value of Teaching Brain Science to Patients and Students

Dr. Buczynski: What are your thoughts on teachers and practitioners actually teaching about the brain? What about teaching brain science to patients and students?

Dr. Cozolino: It might just be my bias because I'm so interested in brain science, but this is what I've experienced.

One is that it's much easier to get left hemisphere biased people invested in therapy, because it's a scientific explanation for the value of emotions. For the most part, people who are very rational want to know: Why should I feel bad? What good is it?

We give them the usual metaphor. Sometimes you have to break a bone to reset it, and they don't like that very much.

But if you give them a rationale for the neural biological structures and the interwoven nature of cognition and emotion and also describe to them what they're feeling or what they're experiencing in a non-shaming structure...it takes away the hierarchy.

We all have these brains that are imperfect and we're just trying to make it through the day. A lot of the things that don't work for us don't work because of evolution, not because we have character flaws.

So that's an important part.

Here's something else that's important, and we talked about already. There's not enough appreciation for the relationship between stress and well-being and learning.

“If you give a rationale for the neural biological structures and the interwoven nature of cognition and emotion...it takes away the hierarchy.”

One of the things we're going to run into over the next decade or so are people getting increasingly emotionally and physically ill from overwork, especially as the economy changes....

In schools, teachers don't know the relationship between stress and neuroplasticity, and until they do, they'll never be able to have the balanced perspective of support and challenge.

That's one of the basics that we learn in psychotherapy, in psychodynamic therapy – when you make an interpretation or you do a confrontation then you back off. You're holding the hand and

you're fencing with the other in some ways.

I'm not sure that that idea is part of teacher education. It's not part of teacher education that *the person of the teacher* is the most important tool that they can use.

We do a bit more of that in psychotherapy. One of the goals of this book is to begin or push the dialogue that teachers need to be trained...not as psychotherapists, but with more emotional intelligence about themselves, their own well-being and self-care, and about the psychological foundation of learning in the classroom.

“Until teachers know the relationship between stress and neuroplasticity, they'll never have the balanced perspective of support and challenge.”

Dr. Buczynski: I'm so sorry we're out of time. We've covered a lot, but there's so much more. I would refer folks to the book, *The Social Neuroscience of Education: Optimizing Attachment and Learning in the Classroom*.

“...the person of the teacher is the most important tool that they can use.”

I've been talking with Lou Cozolino, and he has written many, many books on neural biology, as it applies to psychotherapy, aging, and in so many other ways.

Lou, it's great to see this new area that you're getting into. Actually, it's not new – you've talked about this a lot, but it's new to see you putting all these pieces together for us as we think about learning and about the classroom... Thank you so much; I appreciate it.

Dr. Cozolino: Thank you and thanks for having me.

Dr. Buczynski: Goodnight everyone. Take good care.

About The Speaker:

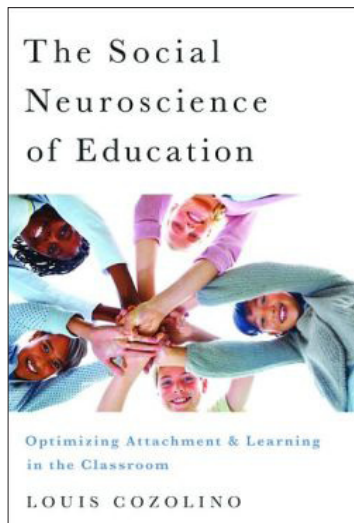


Louis Cozolino, PhD is a Los Angeles private practice clinical psychologist, a Professor of Psychology at Pepperdine University in California, and an Adjunct Professor of Psychiatry at UCLA with twenty years of teaching experience. He has conducted empirical research in schizophrenia, the long-term impact of stress, and matters of child abuse.

Recently, his interests have turned to neuroscience and its relation to psychotherapy. He is the author of several books, including *The Social Neuroscience of Education: Optimizing Attachment and Learning in the Classroom*.

Featured Book by Speaker: Louis Cozolino, PhD

*The Social Neuroscience of
Education: Optimizing Attachment
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