Why Therapy Works

A David Van Nuys Interview *with* Louis Cozolino

D: Dr. Louis Cozolino, welcome back to Shrink Rap Radio.

L: Thank you, good to be here, David.

D: Well it's good to have you back here—and such exciting times we are living in in terms of what neuroscience has been revealing, and you have been one of the primary documentarians, so I'm glad to have you back. We talked back in 2013 about your book on the science of psychotherapy; now you have got a new book out which is entitled *Why Therapy Works: Using Our Minds to Change Our Brains*. It sounds like it could be a little redundant of the earlier book, what does this new book add to the picture?

L: Two things that come to mind. The first is that I have tried to consolidate and focus, like a laser beam, the core principles that have emerged from the other books that I've been writing. I don't talk so much in depth about the science in this book; this is more a book for people who want more of a condensed, focused version. I've tried to make it as applicable to psychotherapy as possible, assuming that people by now have a surface understanding of the science.

D: Yeah, and I think it really succeeds at that. So who is this book for? Is it a book primarily for clients or therapists, or the general public? Who did you have in mind?

L: Well I think compared to previous books, especially the science-heavy books, this book was written for a general audience. I think that therapists would certainly be able to benefit from it but [on the whole] the general public that are interested in therapy. One of the challenges for the clients is that there are thousands of different forms of therapy, and different sets of initials, and more come out every week, and it's difficult for clients to know how to choose, so they rely on recommendations from friends—which makes sense because you want to get connected with someone who is a good person to work with, who has integrity, and all that—but I think that what gets lost in the "sauce" of the 10,000 therapies is what are the core elements of all therapies that make them either successful or unsuccessful. So that's what I've tried to focus on here: what's the bottom line…

D: …And I've been of the opinion that maybe we've gone from 10,000 to 9,000 or even 6,000 because of the core understanding of neuroscience and what works. I really think that there is more of a consensus that is beginning to develop.

L: Yeah, I think we are getting to the core elements of what are the levers of change, and I think that is really what I've focused on in this book. Of course one of the two primary ones is the centrality of relationships and the power of relationships to regulate emotion and for the creation of new learning. And the other piece is the science of neuroplasticity, in other words what are the underlying mechanisms of action that allow the psychotherapeutic relationship to result in change.

D: Well before we get into that, why to people need psychotherapy in the first place? Any generalisations we can make about why human beings need therapy?

L: Well it's not really a generalisation, it's pretty broad, but we can get a few points from it—is that it's evolutions fault. I blame it on evolution.

D: OK. [Laughs]

L: What evolution has done, is that evolution adapts to situations—and we adapt—and there is natural selection and all of that, so we adapt to the environmental changes, both physical environment and the social environment, and humans at least have developed these incredibly large, complex brains that are problematic. Like if you've been driving a Subaru for years and you

Photo: Ron Hall

buy a Ferrari, you are overwhelmed by the amount of maintenance and attention to detail and problems that occur with a Ferrari. And it's the same thing with us; we've got brains that really are like Ferraris, and there are a lot of things that can go wrong now, and I think that's why therapists have so much job security—because so many things do go wrong. So I blame evolution.

D: One of the things that you mention in relation to this, which fits with what you are saying about the brain, is what you call the *vital half second*. What are you getting at there?

L: The parts of our neural functioning and how our brain works that we share with other animals, we still have. And a lot of our moment-to-moment existence is still run by these very primitive networks of the brain stem and the limbic system—all of the mechanisms below the cortex. That's why we can drive and listen to music and do our nails all simultaneously, because a lot of that stuff is done on automatic pilot, as is respiration and reflex activity. Consciousness is a very complicated achievement and it takes many, many more neural connections and a lot more neural processing; it goes very fast still, but it takes about a half a second for us to be conscious of our experience. And so the *vital half second* is between the almost immediate reaction of the primitive brain and the 500 milliseconds it takes for us to have conscious awareness, and within that half a second all of our history shapes our experience in ways that are both good and bad, depending on how good a match our past experiences are with the present.

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D: You know, one of the hats I wear is that of market research consultant, and so the work of a fellow psychologist, Daniel Kahneman, about fast thinking and slow thinking—marketers are just seizing upon that for marketing advantage.

L: Yes, well, Marshall McLuhan wrote about this in the 50s and 60s—about subliminal suggestion. The reason why we have subliminal suggestion is because our unconscious processes are reacting by 50 milliseconds. So you can insert pictures of salient images, like sexual or financial things, so quickly in an advertisement that the viewers are not even aware that they have seen it and yet they will be more attracted to a product that is connected with sexual excitement or financial reward.

D: Yeah, even without subliminal insertion of things like that, there is this whole field that has been developed around the process of decision making and how so much of our decision making happens, or at least is influenced, by subcortical processes that we are not aware of, just as our psychopathology is influenced by subcortical processes that we are not aware of.

L: You know, I think Antonio Damasio woke neuroscience up to this in the mid-1990s with *Descartes' Error*, showing the relationship between the somatosensory cortices and decision making, and how much of it is driven by intuition and our ability to pull the trigger on decisions. And of course advertisers have known this for a long time, and social psychologists have known this for a long time, while neuroscience has been a little late coming to that party.

D: Now you introduce a term that I've not heard before, which is the "social synapse". What is the social synapse and what's its role in why therapy works?

L: Well I think, as background to that, I've learned so much—and I think others have as well—we learn so much by observing the behaviour of other animals. Because we don't have skin in their game. We don't have all sorts of ego tied up in it. So we can see, by watching other animals, how our behaviour is similar and get a new window into our own day-to-day functioning. I think in the same way I've learned so much about human behaviour in psychotherapy by studying how neurons interact with each other, and so what I've done—and I think about conservation and evolution: when evolution develops a strategy it tends to be conserved from simple organisms to more complex organisms—I've studied the neuronal synapses and seen the types of complex chemical interactions, the glial interactions with the neurons, all of the complex

processes that are involved in neuronal communication, and I realise that it's a beautiful model for the synapse between people— the ever-expanding bandwidth of the ways we communicate with other people through eye gaze, through posture, through facial expressions, and on and on, that gives us so much information across the space between us, the social synapse, that allows us to mind-read, to have intuition, to be attuned to each other to coordinate into social groups so that we are able to function as a group, which is now the mechanism of human survival.

D: You know we tend to think of our mind as contained in the envelope of our body, but what you are underscoring is that our nervous system is in some ways socially connected.

L: Right. As is our memory; our memory is a social function, our emotional regulation is social, and this is not something that I'm making up because I'm a genius—I credit Murray Bowen and people who for the last century have worked in fields like chaos theory and complexity theory that are helping us understand that we are much bigger than this atomised individual. Of course Buddhists have known this for thousands of years as have Hindu philosophers. We are…just again, the whole West is late to this party.

D: One of the things that you talk about is consciousness and self-awareness—as both part of the problem and as a tool for healing or integration. So maybe you can rhapsodise on that a little?

L: I think self-identity, the notion of identity, of self-awareness, these are constructions primarily of the left hemisphere that are approximations of reality, and they are not necessarily designed to reflect reality; they are designed to help us survive. So there are all sorts of inherent distortions built into the way our brains construct our conscious experience of reality that bias our perceptions in a million different ways. And that's what the 50,000 studies in social psychology have shown us over the last 100 years. One of the things that we need to do is realise that we need to become intelligent consumers of what our minds offer up to us as reality. We can't accept what our minds offer up to us, we have to develop a methodology of evaluating what our minds believe so we can come to more sophisticated choices.

D: Now the subtitle of your book, *Using Our Minds to Change Our Brains*, I think that a lot of people tend to equate brain with mind. What's the distinction between mind and brain in your mind?

L: Or is it in my brain? I don't know. The mind emerges from the functioning of the brain, so that I can say. When I think of a brain I think more in terms of the neural "wetware", the memories, the habitat, the reflexes, the behaviour, the things that go back down into our pre-history—all of our relatives back to turtles and frogs and fish. When I think of mind I think of this emergent function from the brain that is mostly guided by the brain but we have the opportunity to see little glimpses of how our brain is functioning so that we can take an almost third-person perspective on our brains. Maybe you have had this experience? Many times in my life I've said things and as it's coming out of my mouth I think "That is a really stupid thing to say."

D: Actually I've had the reverse when I was teaching, and I would say something that I thought was really great and it's something that I'd never really thought before, it kind of just came out in the process. So I guess it can work both ways.

L: Absolutely. There you are, listening to what you are saying and being surprised and impressed by the words. What that means is your speech and your thoughts are not the same thing. Speech is almost like walking or playing tennis, in order to speak as quickly as we do it's a form of procedural memory. It seems to have its own drive and consciousness. And so if you have the experience of being either surprised or ashamed or impressed by what you are saying, that means we have at least two consciousnesses—at least there are two of us in there, right? Maybe they are right and left hemisphere, maybe they are different levels of functioning, who knows? I think this is where the Buddhists really are far ahead of us because they have been studying this for a couple of thousand years, and they realise there is a difference between a self that observes and many other levels of functioning that react. So going back to your question, I think of the brain as the structure of the wetware that houses all of these reflexive patterns and the mind is the thing that every once in a while sees through it and goes "Holy mackerel, look! I'm more than my set of habit patterns."

D: So I don't stand out as a total egotist here, surely you have had that experience yourself as a teacher—of hearing brilliant things come out of your mouth on occasion?

L: No, David, you have to own that. [Laughs]

D: OK, now I'm in the hot-seat!

L: I certainly have had that experience from time to time, and had you not said it I would have said it—so I'm with you there.

D: OK, great! Now one of the things we hear a lot about is mirror neurons. Maybe you can tell us a bit about them and how they contribute to therapeutic change?

L: Well, mirror neurons are found in the frontal and parietal regions of humans and the monkeys that have been studied so far. There is nothing really that special about mirror neurones except that they exist in regions in the executive system—our executive brain consists of frontal and parietal regions that construct space–time. The frontal region is more involved in sequencing and time—I don't know how true that is; they both are—as I'm speaking there's a part of me listening to what I'm saying and I'm correcting myself. Let me scratch that and say that together the frontal and parietal lobes along with subcortical regions such as the cerebellum, hippocampus, and basil ganglion construct space–time. Space–time is the coordination of behaviour in three-dimensional space through time, so it's a four-dimensional construction. And that's how all creatures have existed: the brain adapts to four dimensions, and so our brain constructs this four-dimensional model which allows us to afford the environment and allows us to attach to our parents and allows us to use pens and scissors and tools. Mirror neurons exists at the crossroads of these executive networks that allow us to learn through imitation. This was Skinner's big dilemma with trial-and-error learning theory because everything was behavioural and taught; he could never explain one-trial learning. But had he known about mirror neurones he would have realised he could have explained one-trial learning, because as people are watching things, their sensory–motor systems are actually rehearsing them. That's what mirror neurons allow us to do. And most mirror neurons are focused on the face, the lips, the tongue, so originally they were probably designed to help children mirror facial expressions and learn how to eat early on. What they do in psychotherapy is they link our experience, they help us attune across the social synapse, so that therapists can create an internal model of their clients and vice-versa, and one of the real levers of psychotherapeutic change is the fact that we tend to imitate people we like and we tend not to imitate people we don't like. So the reason why the quality of the therapeutic relationship or the quality of the therapist as a person is so important is that it allows us as therapists to hook up via the mirror neurons to the inner bodies of our clients, and they start to imitate us. And most therapists have had clients who come back and say "You know, I was about to do this thing but I heard your voice," or "What would David do?" So what is happening is that a key method of learning in pre-history has been imitation. And the positive social connection with our clients allows them to imitate who we are, and hopefully, if we are sane and good therapists, they're internalising something positive and helpful.

D: You know, you just gave me a thought: you know how some people when you are speaking with them, their lips will move? Sometimes hypnotists will use that as a way to pick people out who they are going to work with in a stage demonstration. Seems to me that maybe mirror neurons are somehow implicated in that phenomenon.

L: I agree. I don't know that I've always done this—maybe once the mortgage is paid you think about working differently. What I tell clients now when they call me is "Well, come on in, and let's spend some time together and see if we connect." And if we connect, then I'm optimistic that I can help if it's something within the area of my expertise.

D: And so how do you know if you have connected and whether or not that is a mutual thing? Because that seems like a pretty key thing that you have just said.

L: It's pretty much intuitive; you get a feel. It's like dancing—like when you are leading, is someone following correctly, or vice-versa? Are you talking over each other, or are you taking turns? Are your facial expressions linked up? Do you feel excited about working with someone? All of those things, I think, are indications that the link-up across the social synapse has gotten traction and that you have got some leverage to work with someone.

D: So do you ever have the experience where that doesn't happen? And if so, how do you let yourself off the hook?

L: Lots of different ways. One way is that clients can feel it, and by the end of the session I say, "Well, let me give you some names of other people that you can contact." I usually do that anyway, because I don't like to have people feel that I'm levering them into therapy with me. So there are lots of ways to do it; I try to do it in a way that is non-rejecting and respectful. Making a choice of therapist is important, and I want clients to think about this—"I think what we have is good, but I

want you to be an informed consumer, and I know some really well-trained people; check them out, and I'll be here if you want me."

D: Yeah, great. Now one of the chapters is fascinatingly titled "The Non-Presenting Problem". And part of the "law" of psychodynamic psychotherapy has been that the problem that brings the person into therapy isn't the real problem. Is that what you are getting at? Or are you getting at something a bit different?

L: Well I think I'm getting at that, but I'm also getting at another thing. There's this notion of the non-presenting problem, where they come in saying one thing but it's another thing that they need to deal with. That's usually the case, right? But there is a whole other level that gets ignored often by therapists (and I don't think that they get the sort of in-depth training that they should have), and that is there may not be a specific problem at all. Very often what's going on is a set of defences or a style of being, what Wilhelm Reich describes as a character in character analysis. Because most therapists now are not trained in transference or to understand the character or characterological aspects, and very often those things are problematic—that creates all the problems, be it the presenting problem or the non-presenting problem. I'm trying to take it a level or two deeper.

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D: That makes sense. Now, spirituality is a very hot topic these days and more people are talking about it, and it's sprinkled into lots of conversations and books and so on. You have the courage, in the face of all that, to talk about the healthy and unhealthy spirituality. Which seems to be an important distinction to me. Tell us about your take on that.

L: Well it goes back…this is part of my deep history. I remember as a boy walking with my aunts to church and hearing them gossip about everyone in the family and on the way to church hearing them criticise people of other ethnicities and, you know, they had nothing good to say. When they got to church they were very pious, and then walking home, after hearing the scripture and taking communion, they went back to who they were. And I think it turned me off religion very early in life. So I started studying spirituality and later I ended up doing a master's degree in divinity when I was in my 20s. And it was a search for spirituality and meaning; it wasn't about trying to understand a particular religion. What I noticed when I was in divinity school, as I was surrounded by all these people who were studying mostly to be ministers, some rabbis, and some other denominations— I realised how much pain and suffering they experienced and they were trying to cope with through their spirituality, and I could also see the pathology that they were demonstrating in the name, or the guise, of spirituality. So very early on the master's degree in divinity gives me a little confidence that I've got the credentials to talk about this. One of the things that happens in therapy is that we have all this focus on the value of religion, on the value of spirituality, and all this mindfulness business that everyone is talking about, but very seldom do we talk about the narcissism and primitive defences that get buried underneath the religious rhetoric. I think all you have to do is look at the Republican Party for all sorts of examples of how this manifests itself. So I think we do have to talk about healthy and unhealthy spirituality, what that means, and to be able to tell the difference. I don't think therapists should be respectful of spirituality if clients are using it as a defensive structure.

D: Yeah, I totally agree. Now, you have a nifty story at the beginning of one of your chapters in which a friend asks you, "What's the difference between a rat and a human being?" So what is the difference anyway?

L: Well the story goes something like this: if you take a rat and put it in a radial arm maze, which is a maze with a raised platform in the centre and five pathways leading down tunnels, if you put a hungry rat on the centre platform having hidden cheese down the third tunnel, the rat will scurry around and explore the tunnels and it will find the cheese down the third tunnel and eat the cheese. If you wait a couple of days and get the rat hungry again and stick it back in the centre platform, but you move the cheese to another tunnel, they will go down the third tunnel, they will look around and find

no cheese, come out, go back in, find no cheese. Now the difference between a rat and a human being is that eventually the rat will explore the other tunnels, whereas a human being can go down the third tunnel forever. Because they come to believe that's where the cheese should be. This goes back to a question before: what's the difference between our brain and our mind? The rat doesn't have that much of a mind, and so it's very pragmatic. If it checks out the third tunnel a few times and the cheese isn't there it will start looking around. But the brain of a human is so complex that it will develop religions and philosophies about the third tunnel and will create demons that will inhabit the other tunnels and we will go down that third tunnel forever because "that's where the cheese should be, damn it!"

D: Now that may relate to another question I was going to ask you. Somewhere you wrote, "Your mind is not your friend," and you have a whole section on that. What? My mind is not my friend? How so?

L: Well, I mean, to the degree that your mind is occupied with beliefs and habits and ways of thinking that lead to suffering, your mind is not your ally. What your mind is doing is continuing to justify going down that third tunnel. For example, if you had very problematic relationships early in life, if you were abandoned or beaten or neglected or whatever it was, your mind (and your brain) has developed all sorts of ideas and reflexive patterns to intimacy. Then whenever you are confronted with something that may be healing to you or might be positive, you are going to activate old memories and you are going to run away, you are going to destroy the relationship, you are going to turn it into where you came from. And so your mind is not your friend when it justifies habit patterns that are obsolete or anachronistic.

D: I'm sure you have heard the saying (it's not really accurate psychologically) that psychosis is doing the same thing and expecting a different result.

L: Unfortunately it's not psychosis but normal neurotic behaviour. And by neurotic I don't mean the Woody Allan version of neurotic, what I mean is that you keep going down that third tunnel as opposed to taking the risk of exploring the other tunnels and facing your demons.

D: Now you've mentioned mindfulness and Buddhism a couple of times, and it's a very big topic these days—in fact the current *American Psychologist* has devoted the entire issue to mindfulness. What do you see as the role of mindfulness in psychotherapy?

L: I think now it's superficially a lot of people selling a lot of books, right? That's the superficial part of it—it's a cottage industry. The next layer beneath it is that there is finally a recognition in Western psychology of the importance of self-reflection. We went through psychoanalysis and we went through all of the behavioural and cognitive rebellion against the value of the inner world, and so now I think we are swinging back to a moderate position. The mind has a lot of distorted problems; it's not the be-all and end-all—thought and behaviour matter. But if we can figure out how to tame our minds, if we can figure out how to use them and the shortcomings of our minds, then we can tap into a 3,000- or 4,000-year-old tradition of meditation and self-reflection that can serve us very well in psychotherapy.

We went through psychoanalysis and we went through all of the behavioural and cognitive rebellion against the value of the inner world, and so now I think we are swinging back to a moderate position.

D: Yeah, nicely put. To what extent do you think that mindfulness could be a substitute for psychotherapy or maybe a defence against psychotherapy?

L: Oh yeah, all of the above. In fact there are so many yoga teachers and meditation teachers in Los Angeles, and you are hearing all the time of the narcissistic abuses—just like we found in the ministry and in the clergy and all of that. Having tools for mindfulness is only as good as the psyche that they are in. So if someone is a disturbed character, logically they just use the mindfulness to support their defences. And so I don't think that mindfulness can substitute for psychotherapy—it's like EMDR, it's a tool of psychotherapy. It's certainly not a replacement for psychotherapy.

D: Talk about the role of the left hemisphere and the right hemisphere in processing of information and the perseverance of old scripts that get in the way of change?

L: Well I think that the right hemisphere is probably

the "old school" or the traditional hemisphere. The way the right hemisphere is organised is the way both hemispheres are organised in more primitive animals. In other words, it's dominated by fight-flight reactions, high states of emotion, fear, and low states of emotion like withdrawal, playing dead—so, sympathetic/parasympathetic dominance. The left hemisphere is more of an experiment that goes along with the evolution of sociality and humans becoming a fundamentally social species. So the left hemisphere greases the social wheels, it connects with others through right-handed handshakes, and all of that. So what we have is a right hemisphere that is very primitive and has an early critical period, during the first year and a half or so of life, and that's when the unconsciousness of our parents gets downloaded and the infrastructure of our intra-psychic worlds become organised, being downloaded from the intra-psychic worlds of our parents, which was downloaded from the intra-psychic world of their parents. So there is this sort of invisible transition across the generations of the way the world is seen and experienced and all of that. That is the core. That is why what happens over the first few years will be with us when we are 50, 60 ,70, 80, 90, 100 years old, because that infrastructure is built very early on unconsciously—we never remember learning it. And then later, when we develop, the left hemisphere develops, and then back and forth (between the hemispheres)—the data that we have is up until we are about 13 years old, but the critical periods, the sensitive periods, go back and forth between the hemispheres. So we have these two fundamental brains within our skulls that are programmed in different ways, and the left hemisphere is in charge during the day, at least outwardly, with a lot of influence from the right. And the right hemisphere is in charge when we are sleeping—a gross simplification, but that's sort of the general thing. A lot of us know what we should do—we should eat right, we shouldn't cheat on our husbands or wives—yet we still eat the pepperoni pizza. Why? Well we are driven in a primitive way to do these things and our left hemisphere doesn't have the leverage to keep us from doing it. And so I think very often in psychotherapy, people come in and they have watched Oprah for years now, they know what they are supposed to do. But they can't do it…

D: …[Laughing] Oprah can't do it!

L: The reason they can't do it, and the reason Oprah's weight goes up and down, is because of her right hemisphere. She knows better, and she has all the money in the world to have people, dietitians and trainers, but there are more powerful forces than conscious awareness, and that's really these primitive programs of the right hemisphere that were downloaded from our parents and their parents. And that's the reason why it's so important when we are working with clients to understand by going back three or four generations—we have to understand their culture, their histories, their trauma. I have many clients whose behaviour doesn't make any sense given their lives, but it makes lots of sense given their parents' and grandparents' lives. So some of us live out the trauma of our grandparents. These are the things that we have to get smarter about as therapists instead of becoming devotees of one charismatic leader or cult leader. We have to become smarter and more scientific in our approach to clients.

D: Well, the way you laid out the function of the left and right hemispheres there's a lot of new learning for me there. I really appreciate that. I think my brain has been stuck in the 70s where there was a very different description and nothing that really related to therapy. So that's a great new addition that you have shared with us. Can you tell us a bit about the amygdala verses the hippocampus in the way that memory is handled?

L: Well the amygdala…for listeners who don't know much about these structures, they are subcortical structures in the limbic system. There are two of them, one on each side of the brain, both the hippocampi and the amygdala (or *amygdalae* is the plural but no one uses that), and they are lateralised to the degree that they subserve that hemisphere. For example, the right amygdala is more involved with social–emotional functioning and attachment, whereas the left amygdala is more involved with appraisal of semantic and external social information. The hippocampus and the amygdala differ: the amygdala is more primitive; it is our primitive executive structure, and so before we had a prefrontal cortex, mammals and reptiles had amygdala that were making approach/avoid decisions. So one way to think about the prefrontal cortex is just an elaboration of an amygdala that is capable of making more elaborate or fine-tuned decisions about approach/avoidance. The amygdala has a more primitive structure; it exhibits what is called persistent dendritic modelling, and that's a technical term for the fact that if something scares you or terrifies you, the amygdala doesn't forget it—sort of like the elephant in our brain. When we are terrified or traumatised about something, the amygdala is programmed to not let go of that memory. So if you have having successful treatment with someone who has PTSD, or something else related to phobia, you are not getting rid of the memory, what you are doing is

you are building descending circuitry from the cortex to inhibit the output of the amygdala to the brainstem, so that we don't have the panic symptoms or the arousal symptoms. Curing someone of phobia isn't getting them to forget the phobia—they are remembering it—but you are building the necessary descending inhibition to keep the amygdala from activating the sympathetic nervous system.

D: Now where does the hippocampus fit into that paradigm?

L: Well, the hippocampus is a later-evolving structure with animals that was a place map. For example, rats have very elaborate hippocampi because they forage for food, and then they hide it, and then they have to find it again. In fact if you give a young female rat a baby pup to take care of, her hippocampus immediately starts to grow because the smell and interaction with the pup triggers her brain to get ready to have to gather and find and hide more food for her pup. And it isn't mediated hormonally, because it can be a virgin rat that you can give a pup to. So the hippocampus is designed to learn and re-learn, because the food keeps changing places. It doesn't have this persistent dendritic modelling like the amygdala; it's designed to learn something—you learn a map, and then when that food is gone, you learn another map. And the bigger the environment that you have to traverse, the larger your hippocampus becomes. There's wonderful research that shows London cab drivers have much larger hippocampi.

D: Wow. That's great. I can't believe the level we have been able to get down to in terms of studying the brain. These structures are so small, they are so tiny it's hard to believe that they contain so much information. But I guess they are networked out to other parts of the brain, so in fact there are lots and lots of neurons involved.

L: Well think in terms of, now you can wear a computer on your wrist…

D: …I have one right now…

L: …and the computing power of that technology and what it can accomplish—well, evolution has been working on this (the brain) for a few million years. We've got these billions or trillions of connections, and that's really what information processing is all about: it's just the number of on or off switches throughout the brain in very complex patterns.

D: We talked about the social synapse earlier, and then later in the book you have a whole section devoted to the social brain. How does the social brain figure into some of the disorders that you discuss such as the failure to thrive, depression, self-harm?

L: When you begin to think of the brain as a social organ, psychopathology starts to realign itself, in a way, around the attachment history. You also think in terms of the brain's primary environment being social relationships. So the nature of attachment doesn't only make you secure or insecure, it is also the primary stimulus for brain growth. The effects of deprivation, the effects of institutionalisation, parental loss, all of these things have a profound effect, and not just on someone's psychology, but on the very structures, the neuroanatomy, the biochemistry of their brains. We tend to think of attachment schema, for example…it's almost like a cognitive notion of it. But the internalised mother or parent is not just a picture of your mother at the stove stirring sauce, like it is for most Italian boys. What it is is the number of endorphin receptors in your amygdala, of cortisol receptors in your hippocampus, or the hierarchical networks between your prefrontal cortex and your amygdala and your brainstem, the construction of the von Economo neurons that connect the different levels of our basal forebrain and allow us to have complex communication across different levels of our neuronal axis. So the internalised mother goes very deep, down to the ability to love and work and learn, to regulate emotion and all of that. In order to understand the brain at a higher level, we need to understand that a brain…we can study a brain under a scanner, but when you separate it from relationships, you are not getting the real picture of what it is and what it does. Social neuroscience can create this little ball toss game, which I think is wonderful—with Naomi Eisenberger at UCLA, they have the ball toss game going back and forth with the person, and then the person gets excluded, and their pain circuitry becomes activated (while they are playing this computer game lying underneath the scanner). They found later that if you give someone Tylenol, the effect of the social rejection isn't as bad. So this shows that our social behaviour is grounded in the evolution of our physical experience. So that makes sense—it's another strike in the direction of evidence for evolution, right? But all of these things help us to understand just a bit of what goes on in social relationships, although it's not the same as studying us in relationships. Social psychology really has the edge and the history in that department.

D: To me this is the most fascinating and exciting aspect of this emerging neuroscience, the way that it's been possible to correlate and anchor attachment theory—in

some form or other it probably goes all the way back to Freud. Then it got elaborated by others as time went on. But now to understand it in terms of neuroscience I think is just very exciting.

L: Oh yeah. It's wonderful to get it at this other level, and I think that we are yet to understand attachment theory in the context of social groups. That I think is the next challenge. You know, I wanted to say too that in this book *Why Therapy Works*, a couple of chapters are forming the core of my next book which has to do with social status schema. I've been working with CEOs and executives in the last few years, and so I've become very interested in alpha and beta behaviour in social groups and decision making and leadership and all. I always naively assumed that people's social behaviour in groups was dependent on their attachment schema, but what I've got to see over the last few years, as I've been looking closely, is that there are people who are all kinds of different "secure alphas", "secure betas", "insecure betas", "aspirational betas"—there are all sorts of different manifestations of social status schema that are orthogonal, or unrelated, to attachment schema. So then I began to see that just like we have these implicit memories that we call attachment schema, we also very early on develop social status schema. Which get activated not in intimate relationships but in group situations, that lead us either to go to the front of the group or to be in the middle of the group or to stay at the back of the room. In the animal kingdom a lot of these things, like attachment schema, are inherited from parents, and most of us inherit social status schema from our parents, probably biochemically and also through modelling. And so this is the next thing I'm working on. I think therapists largely ignore this because therapy exists outside of the world. But when you are in a corporate situation, you see that if someone is biologically programmed to be a beta but they are trying to be an alpha, all of the different aspects of shame come up. And shame isn't about their behaviour, shame is about who they are as a person. And I've come to believe that core shame—the shame that's not about our behaviour but feels that it's about us—that's not a function or mechanism of individual psychology as much as it's a mechanism of social organisation.

D: I'm going to look forward to interviewing you about that book when it comes out.

L: So that's the thing that I'm working on now, and I'm benefiting from the work that I've done on attachment and the neuroscience, but it really is somewhat new territory for me, and I'm looking at aspects of leadership. I'm really interested in all of these strategies that are now emerging—how to pick up women, for example. Because I think in the context of these pick-up artists, there's the thing called "the game" and other things—are these primitive social status manifestations that are being utilised in a somewhat distasteful way to form relationships?

D: That's and interesting leap! But it does make sense as you describe it. I hope that your research and your book will help us understand why meetings are often so dreadful.

L: Aren't they terrible.

D: Yeah, they are terrible, and I was in a psychology department for 35 years and all the individuals in there were fine, noble people…but our meetings! We struggled and struggled; people hated going to the department meetings.

L: Yeah, they make me lose the will to live.

D: [Laughs] So you know what I'm talking about.

L: Oh, very well. I figured that I got so disruptive at those meetings that when I didn't show up people were happy. So that works out for me.

D: Well we have covered a lot of your book, but we want to leave out enough to motivate people to buy it.

L: [Laughs] They no longer need it now, they've got it!

D: No, no, they got a bunch of it, but believe me, there's a lot more meat in there. So I'll just ask you about one more topic, and it's a huge topic, and that's trauma. What should we know about trauma and why psychotherapy can help from a neurological perspective?

L: Well, there's been a lot of trial-and-error over the last 130 years at least—I'm dating it back to Freud's neurology residency at the Salpêtrière when he was working with Charcot. The foundation of psychoanalysis was working with people who had had industrial accidents and the neurological manifestations of those things that didn't seem to have a neurological foundation. I think we still have a way to go in understanding how the brain functions and what happens in trauma, but we have many of the important pieces. Like we have said before, we have to understand that the amygdala was the primitive executive system

and it retains veto power over the cortex in times of overwhelming stress. Just like the right hemisphere feels or bows to the left hemisphere except in states of very high arousal. So what trauma does is that it activates the primitive part of our brain—puts it in control—and it makes it very difficult for us to re-regulate our brains to live in modern society and regulate affect in a way that is helpful. There are some new things; one of the things that I've come across in recent years…I've always believed that…one of my teachers, Bessel van der Kolk, was very supportive of EMDR, and I was always sceptical, until eventually I took the training and I realised—holy mackerel, this stuff works! But then I had to ask, "But how does it work?" That was the question. And so what the neuroscience shows us is that when you are traumatised, your neural coherence changes to the point where…for example, for people who don't have PTSD, when we run into some new experience, there are certain areas of the frontal lobes that become activated: the interior cingulate (near the frontal lobes), for example, detects the anomaly, activates attentional mechanisms, and we are alerted that we have new information coming in and our hippocampus wakes up. For people with PTSD, one of the changes in neural coherence is that when something new arises, the anomaly detectors don't get activated but autobiographical memory becomes detected. So for people with PTSD, everywhere they go, when they run into something new, they have been there and it's bad. And so you have this symptom in PTSD called neophobia, which is the fear of anything new, that arises from this shift in neural coherence. The way I imagine EMDR works is that you are activating the orienting system through the eye movement or the bodily touching, or whatever they do—the physical manifestations of EMDR therapy—you are activating the orienting system in a way that allows the brain to override that reflex to go to autobiographical memory. So what's happening in EMDR is that your neural coherence is changing to the point where you can process and update old information. And I think that's how it works.

D: OK. Boy, you got a lot out there. One of the other things I was going to ask you was, is there a particular approach to working with trauma that you think is most effective? Would it be EMDR? There are a number of them out there now that pretty much target trauma.

L: You know, I always think about those large chrome tool boxes they sell at Sears that most people envy. Your whole life you think, when I grow up I'm going to get one of those giant tool boxes. That's the type of tool box that you need if you are working with trauma. You need to explore and study all forms of intervention, and as we understand more about what happens to the brain, we will know when to open which draw and which tool to use. If you do EMDR training, you are not a trauma therapist, you are someone who has a tool. If you buy a wrench, it doesn't mean you are a mechanic. There are somatic therapies, there are all kinds of different treatments, systematic desensitisation—the skill is in creating a relationship with the client that makes them feel safe, and in selecting the type of intervention and being able to implement it or bring in other people to work with you. Bessel van der Kolk has a new version of his old book *The Body Keeps the Score*; he really has the right approach, to use whatever works, and the therapist has to figure out what that is.

D: Yeah, I interviewed him about that book, and I remember that he talked about EMDR. So you studied with him?

L: No, I've studied his work, and for me he's been the major voice of reason within a very dysfunctional trauma therapy world. He's the buoy in the middle of the ocean.

D: As we wind down, is there anything else you'd like to add?

L: Just going back to the notion of the social brain I think that we have to stop thinking of the brain as this organ in the body like a pancreas or liver. The brain is really—and I love Dan Siegel's definition—it's a hub of energy and information. And the hub thing is really important, because what it does is link us with other brains. As a social brain we are part of a whole, right? And I think that that is the way we have to study brains going back to Murray Bowen and the systems therapists from 50 years ago; we have to see the brain in that way because we exist in relationships even when we are sitting alone in a cave on a mountain top: all of the people we have been in relationship with live inside of us. And like in AA, you can make a geographical intervention, but everywhere you go, there you are. You can't get away from yourself and all the people that are inside of you.

D: OK, well you have given us a lot to think about. So Dr. Lou Cozolino, I want to thank you for being my guest again today on Shrink Rap Radio.

L: You're welcome, David—my pleasure.

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