The Neuroscience of Psychotherapy

Louis Cozolino

A Dr. David Van Nuys Interview

Dr. Dave: My guest today is Dr. Louis Cozolino, and we'll be discussing the relevance of the latest neuroscience findings for the practice of psychotherapy. Louis Cozolino, PhD, is Professor of Psychology at Pepperdine University and a therapist in private practice in Los Angeles. He's the author of five books: *The Neuroscience of Psychotherapy*, *The Social Neuroscience of Education*, *The Neuroscience of Human Relationships*, *The Healthy Aging Brain*, and *The Making of a Therapist*. He's also authored or co-authored research articles and book chapters on child abuse, schizophrenia, and language and cognition, including the chapter on sensation, perception and cognition for the current edition of *The Comprehensive Textbook of Psychiatry*. Now here's the interview:

Dr. Dave: Dr. Louis Cozolino, welcome to Shrink Rap Radio!

Cozolino: Thank you, it's good to be here.

Dr. Dave: Well, it's great to finally have you on the show. I've been doing a lot of reading in neuroscience, and your name keeps popping up. And I think we have some friends in common… I'm thinking of Ron Alexander and John Arden—do you recognize those names?

Cozolino: I sure do.

Dr. Dave: Yeah? Great. Well, they say great things about you too: "Oh yeah, he's a great guy and you should talk to him." So you're trained as a psychologist, as I am, and maybe we're of more or less the same era. How did you first become interested in the integration of neurology and psychology?

Cozolino: It's an interesting story. I was trying to recall the details of it a few days ago. I was at Harvard in Divinity School…

Dr. Dave: Oh my goodness! That's a big jump!

Cozolino: Yeah, well I was studying pastoral counseling with one of Carl Rodgers' students and studying…you know, I had done an undergraduate degree in the Philosophy of Eastern Religions so I had a background in Sanskrit and Hinduism, Buddha and so forth…

Dr. Dave: Great!

Cozolino: And at divinity school I was studying more Western Religion and trying to figure out what to do with my life, and in the afternoons I would go into arts and sciences, and I was doing the equivalent of an undergraduate degree in psychology in the afternoons. And as part of that, I just started taking these courses in psychology, and one was Physiological Psychology. Another was a lab course with B. F. Skinner where I got to train pigeons to distinguish between different pieces of furniture and all sorts of weird things like that. But I just started learning about the rat, monkey, and pigeon literature, and learning and brain functioning. I had been interested in schizophrenia for a long time, and I started seeing the similarities between rats with hippocampal damage and schizophrenic patients that I had worked with, and so I slowly started reading this animal literature that no one really in clinical psych had looked at, and I started developing this theory about hippocampal accuracy in schizophrenia. And this was probably in the mid-70s, and of course I had no credibility—who listens to a divinity student who has theories about schizophrenia based on animal research?—but that was the beginning of it. And what I found over the years was that my instincts were pretty good. I kept predicting where the science was going, and eventually I started…or rather, I stopped being hesitant and just started to dive into neuroscience. And then when I was at UCLA doing my PhD, I got very interested…or I was much more interested in what was happening in psychiatry and neurology than I was in the psychology department, and so I ended up spending most of my time in psychiatry and neurology.

Lou with his grandparents on his 3rd birthday

Dr. Dave: What a fascinating background! And I can tell from your references—Skinner and so on—that we are of about the same generation. Of course, Skinner was famously opposed to knowing anything about the brain, you know, and he talked about it as the "black box", and that it really didn't matter what was going on in the brain.

Cozolino: Yeah, well I think that his reaction was more a reaction to psychoanalysis. I don't know if he was so "anti-brain" as much as he was "anti-mind".

Dr. Dave: Well, your book is *The Neuroscience of Psychotherapy*, and I must say that it is really a fascinating tour de force. It is definitely one of the key books in this area. And I know that it's in its second edition; that you actually updated it.

Cozolino: Yeah, we had between the first and second edition…I think there was as much published in those six or seven years as there was before. I had actually written the first edition, and so the second edition isn't just…I didn't just repackage it in order to take the first edition off the used book market like is so often done, but the second edition actually has, I think, an extra 40,000 words or so, and an update with a lot of new science.

Dr. Dave: My goodness, what a task that must have been!

Cozolino: Yeah, I really think of it as a separate book in many ways.

Dr. Dave: Well, you begin your book by paying tribute to Freud; actually, you sort of begin with Freud and end with Freud. And you begin by paying tribute to and calling attention to the fact that he wrote a book titled, I don't know if it was a book or a long paper, *The Project for a Scientific Psychology*, which he did not allow to be published until after his death. And I had not previously known anything about that. Share with our listeners, if you will, the general thrust of that.

Cozolino: Well, you have to go back to the 1880s. Freud was originally a neurologist, and his first publications were in aphasia. He was very interested in language production, and he did his neurology residency at the Salpêtrière with Charcot. And it was Charcot's interest in hypnosis and the relationship between mind and body that really established Freud's basic theories. Then, I think that what he found was that the neurology—the science of neurology, the professional field—was very interested in brain–behavior relationships and brain–observable behavior relationships, and overall they weren't very amenable to thinking about the mind in any kind of sophisticated way. Though I think he made a very deliberate decision; at least, this is my projection onto what happened a hundred years ago: he made a deliberate decision to not talk about "brain", to stay in "mind" and to talk in terms of cultural anthropology, mythology and those things to explain the functions of mind. But in 1896, which is the year…I think that's the year…he wrote this monograph called *The Project for Scientific Psychology*, and in this monograph he drew diagrams of neural networks and how the different senses might be manifest in different neural network patterns. And you have to keep in mind that Leeuwenhoek had just invented the microscope not too many years before, and until then people thought of the nervous system as sort of this consistent goo or fluid. And so Freud believed that there was a neurobiological substrate for the phenomena of mind and all the things he was talking about in psychoanalysis, but he seemed to make a deliberate choice to not talk in terms of brain, which is why, I think, he suppressed the publication of that paper. He died in 1939, and the paper appeared in its standard edition in 1953.

Dr. Dave: Well that's really fascinating. And from conversations that I've had with some other interviewees in the neuroscience area, it is seeming more and more like Freud got it right in terms of many of the broad strokes, kind of broadly. He

seemed to...even though he was speaking metaphorically, it seems like he captured an awful lot of thoughts emerging now as neuroscientific facts.

Cozolino: Yeah, I mean, his genius is unquestionable. The problem is that I think it became stylish for many years, the last 30 or 40 years, to criticize him and sort of throw the baby out with the bath water, but there's a beautiful baby in Freud.

Dr. Dave: (*laughs heartily*)

Cozolino: And you have to keep in mind too that Freud was a Darwinist; he was an evolutionist, and so now nothing in biology happens without evolution, and neuroscience is deeply embedded in evolutionary theory, and that's how we're coming to understand neuroscience, and how the brain operates—especially how relationships work.

Dr. Dave: Yeah, you do a beautiful job in your book weaving together evolution and hereditary influences; and also one of the things that you talk about, since we're talking about Freud, is attachment theory—and it seems like all the people who are working in neuroscience tend to make reference to attachment theory, which again is an outgrowth, I think, of Freudian insights—kind of post-Freudian work. Maybe you can say something to us about that, about the importance of attachment theory in the emerging neuroscientific understanding of the mind.

Cozolino: Well, you see, the field of modern attachment theory began with Bowlby as far as I know, who observed both gorillas and apes, chimps and their babies. And doing his clinical work, he worked with mothers and children. And so again it's another connection to an evolutionary perspective in what he was looking at, which was the way that babies use proximity to the parent to regulate autonomic arousal, and that really is what the attachment paradigm is. If you think about how it's measured in a one-year-old in a strange situation, they put a child in a situation that Bowlby found caused distress calls in primate infants, which is to separate the mother and the child and put the child in the presence of a stranger. That is really what the infant–stranger situation is. And what you measure is the reunion behavior when the mother returns, to get a sense of how the child perceives the mother as a source of autonomic regulation, of fear regulation, and so that was planting one foot in evolutionary history, in evolutionary theory. The other foot is mostly now the connection to epigenetic research that has used mostly rat and pup pairs to measure brain functioning in maternal attention. And what we've learned through that is that maternal attention builds the brain, I mean it creates all sorts of biological set-points; it builds receptors, it builds neural networks... And so the century-long knowledge that there is a relationship between early experience and adult functioning...we now have this mechanism of action through epigenetic processes where we understand how the brain gets built, and then how that brain functions in the world as an adult. We understand why those correlations exist now.

Dr. Dave: Yeah. Say a little bit more about... maybe not everybody is familiar with the term *epigenetic*, so maybe you can kind of bring us up to date in a thumbnail sketch.

Cozolino: OK. Well you know, for most of us the genetics we learned about in high school was the template genetics of Mendel: the peas. You had green peas and baby peas and different variations, and he came up with concepts like recessive and dominant traits and those sorts of things. He studied the mathematics of genetic inheritance. That's template genetics. That is related to the chromosome exchange and pairing up when you have reproduction and going on to the next generation. But what that doesn't account for is that in humans we have 23,000 sets of genes, and we've long known that you have identical twins where one becomes autistic or schizophrenic and the other one doesn't. So it isn't just the genes that determine behavior or experience. There is this other process called epigenetics, and what epigenetics really says is that genes are expressed based on experience. So it's like this: imagine a piano keyboard with 23,000 keys. You don't play them all at the same time. What you do is you select keys in order to play certain songs, and so the parallel of the brain is that certain sets of genes are expressed based on a combination of nature and nurture that become...this is how love becomes flesh; how a parent's caring for a child builds a brain in a certain way that helps the child to navigate the environment—or not, in negative cases.

Dr. Dave: Yeah, there used to be a big debate in psychology about "nature vs. nurture". And I guess what has emerged is that its nature *and* nurture. It's not one or the other, but both are playing important roles. By the way, I want to apologize to my listeners—if you're hearing noise in the background, it's from my side. Somebody's outside mowing the lawn and using a blower (*laughs*). So hopefully it's

not going to be too loud here. Maybe I'll be able to eliminate some of it in post-processing. Now, you write that aspects of development foster positive brain development, and those in therapy that promote positive change are emotional attunement, affect regulation, and co-construction of narratives. So now we're kind of moving in the direction of therapy. Tell us a little bit about that. Can you kind of unpack that a little bit for us?

Cozolino: Sure. I think that what therapy really is tapping into is the same social, biological processes that occur during early development. So what you're doing in therapy is tapping into those regulatory processes that enhance brain development, and so that whole model of therapy as re-parenting in many ways is much more accurate than we ever used to think it would be, you know? I mean, using it as a metaphor. There are two things: in order to change, in order to learn, there has to be neuroplasticity. There's no way to learn anything without there being changes in the brain. And brain change in humans mostly depends upon the growth and extension of new dendrites that make connections with connecting neurons, which allows new brain to be born. And so you've got…first of all, you need to have the proper environment—the proper learning experience and the context to where the information is actually positive and helpful on the one hand, and on the other hand, you need to have an emotional regulation that supports protein synthesis and the building of new dendrites. Because when we're stressed out or overwhelmed or traumatized, high levels of cortisol and adrenaline result, and the cortisol actually inhibits protein synthesis. So when we are overly stressed, it's really impossible to learn new things, other than to be traumatized and learn those traumas. So in psychotherapy it's sort of this balance between interpersonal connection and support and nurturance, which regulates affect—that's the attachment piece. And then on the other hand, you're structuring the learning environment for that person depending on what they need to learn to help them to build new brain that will work in their best interests and help them function better.

Dr. Dave: Yeah, you mentioned that high levels of cortisol become problematic in learning, but you also suggest that some stress actually will facilitate learning and change, so that there's kind of a "sweet spot" in terms of how much stress or challenge is involved.

Cozolino: Right, and I think any good parent or therapist or teacher knows you challenge students, and you challenge them to a place where they're enthusiastic and motivated and then there's a sort of flow that occurs, but if you put too much pressure on them or expect too much, or the demands exceed their abilities, then they pretty much shut down. Another phenomenon like this is if you ever get really frightened you'll find yourself not really functioning at your highest level of potential, because executive function is inhibited during high states of arousal. So there is a delicate balance there in all learning situations to try to attain that "sweet spot", which is probably a mild to moderate level of stress. And all of this is grounded in the amygdala, which is the center of fear circuitry and autonomic activation. At mild to moderate levels of activation, the biochemistry of the amygdala activates the hippocampus to learn, and at very low levels of arousal and very high levels of arousal it actually inhibits the hippocampus from learning. You've got to get that "sweet spot".

Dr. Dave: You write, "All forms of therapy are successful to the degree to which they find a way to tap into processes that build and modify neural structures within the brain." And then you go on to talk about psychodynamic therapy, client-centered therapy, cognitive therapy, systemic family therapy and Reichian and Gestalt therapies. How is it that these diverse therapies capitalize on the plasticity of the brain? Do they share common factors? Or is each one capitalizing on a different feature of the brain?

Cozolino: Well, I think it's that they're capitalizing on different features, but it also depends on the match between the person and the therapist and the intervention. So there's also that kind of variable that can be figured out. There are some patients who will benefit a lot more from a cognitive behavioral intervention than they would from a Gestalt intervention, and that has to do with their level of arousal, their trauma, their connection with the therapist, the ability of the therapist to soothe their arousal in the context of exposure. All of those things factor in. I think that the reaction that I had during my training was that every professor and every supervisor I had was sort of like a religious devotee of some cult. And as I moved from one supervisor to the other, I was impressed with what they were teaching me in a positive way, and I was very unimpressed by what they were teaching me about their prejudices against other forms of therapy. And I really wasn't looking to become a disciple.

Lou with good friend Dan Siegel, celebrating 25 years of friendship at their favourite restaurant this year.

I was looking to become someone who could use whatever was available to help the individual client that I had. And so I think that in order to move to an intelligent empiricism and the ability to use multiple interventions, we have to get beyond cultism and we have to really think in terms of how we match this client with this treatment with particular problems, and also our own personalities.

Dr. Dave: Is there perhaps a danger that this neuroscience will become the new cult?

Cozolino: Well, I think certainly there is this drive—like when Nietzsche used to talk about the will to a system—that if you're insecure and you're overwhelmed by the world, you need to come up with some easy explanation for reality that you apply to all situations. So I think that anything can be used in that way. So certainly there is a risk of it. And I hear all the time you can take generic psychodynamic theory and every once in a while use the word "amygdala", and now you're a neuropsychiatrist, which is really kind of bogus to me. There really isn't any kind of neuro-psychotherapy. What neuroscience teaches us is why therapies work when they work and why they don't work when they don't work. It's the underlying structure that... I mean, every client has a brain. And just about every therapist does. And so we're dealing with the same biological structures.

Dr. Dave: Yeah, there's so much excitement about all these new findings about the brain, but in terms of psychotherapy, how do we know it's not "new bottles for old wine"? Let me explain what I mean here. Just this morning I received a very thoughtful and provocative email from Oskar Stahl,

Lou with his son in 2008

who is a graduate psychotherapy student at the University of Stockholm. I got a chance to meet him at a dream workshop that I did there this summer. And he put the question so clearly in his e-mail that I'd like to read his e-mail, if I may. He writes, "The bottom line is that we are seduced by the lingo of brain science. It sounds as if we have learned something new when speaking about what 'the brain' wants and how it works, but quite often we're just substituting for the word 'people' or 'human beings' with the term 'the brain'," and he says, "The article refers to workplace setting, which revealed that the brain doesn't work well in large, open office environments because of the many disturbances and distractions. What this really tells us is that people don't really work well when surrounded by disturbances and distractions, which is already implied in the words 'disturbances and distractions', so if a therapist says to his patient something like, 'You have an underactive left pre-frontal cortex and an overactive amygdala; if you go out and activate yourself even though you don't feel like it, your left prefrontal cortex will also be activated and your amygdala will calm down,' how is this anything different from saying, 'Clinical experience shows that behavioral activation alleviates depression and anxiety—go out and see some friends.'?" (*Cozolino laughs heartily*) Yeah, he's saying this so much better than I could. Let me just go a little bit further with this e-mail. He says, "Or if the same therapist says brain research has revealed lifelong brain plasticity, how does that differ from saying that developmental psychology has shown that people can learn new things and change their behavior no matter their age? I can see that a brain-based approach would give the patient a new rationale, which for some may sound appealing and exciting, and if that gives them more confidence and trust in the therapeutic process, that's great. But I can't get past this feeling of the 'emperor's new clothes'. Can you point to something that convinces me that brain research really contributes something that other fields of psychology can't? (Needless to say, brain research is, of course, absolutely vital when it comes to purely biological/physiological matters like Alzheimer's disease, Stephen Porges's work, etc.)" OK, now it's your turn.

Cozolino: (*laughs heartily*) I agree with just about everything he said. I don't really have any problems at all with that sentiment. But to the question of what neuroscience adds, it doesn't add a new form

of treatment. It certainly does create a rationale that hooks in a group of patients that it never hooked in before: those highly scientific or mathematically minded, those left hemisphere-biased people. And now I have many more people in practice who are that hard-edged, objective, empirical type of people, because the science provides a rationale for why they should feel comfortable. It's in the service of what? Whereas my psychodynamic explanations or my object relations or my client-centered explanations just felt to them like airy-fairy baloney that they couldn't buy into. So one thing that I noticed is that I keep a lot more patients now than I used to. And I have a lot more male patients than I used to. You know, you didn't have to explain to women why feeling was important, right? And the neuroscience really does describe why affect is half of what you need in order to get through life, besides cognition. And so in that way it's really helpful. Another thing that's helpful is—and again, I don't think that neuroscience creates new treatment, and I think that's where a lot of people make mistakes—there isn't really any satisfactory neuroscientific psychotherapy, but for example, you look at something like EMDR; I was skeptical for a long time, and finally I just took the training because I finally got tired of being skeptical. EMDR is an amazing experience. How the hell it works we don't know, but there are new scientific discoveries about the orient response, about shifts in memory processing in people with PTSD vs. people without PTSD that are starting to give us a good idea of an explanation of how EMDR works. And so I think the…I don't really think of neuroscience as giving us new therapies. I would do object relations therapy till the cows come home, right? I mean I really love that. But I like to know what's happening in the brain, what's happening in the neurochemistry. I like to be able to speak to pharmacologists in an intelligent way, knowing at least what they think they know about what the psychopharm does to brain functioning and arousal, and all that. So to me, I found it incredibly exciting and enriching, and it's only helped my practice, but I am essentially an object relations therapist who knows about neuroscience. I'm not a neuropsychologist. I don't know what that is.

Dr. Dave: Well that's fascinating. I wasn't anticipating that that would be your reply. And you do give some case examples in the book, I believe. Do you have any case examples at hand that might illustrate how your knowledge of neuroscience made a difference in how you worked with a client?

Cozolino: Well yeah, one you might remember; it's one of the early ones for me, one of the first. Very salient. I was working with a man who was in his late 30s and who had had severe early physical and sexual emotional abuse, fairly sadistic abuse, things like being put in the washing machine, and having the hot water turned on and having the agitator turned on [*Dave: Oh my…*] when he was three or four years old. I mean just horrendous stuff. He was sexually abused while bones were broken or while he was being burned. I mean just the worst stuff you could possibly imagine. In fact, it's hard to imagine human beings behaving in this way to any other human being, let alone a child that you're related to. So I had met him through this organization we were both members of, and he was a very high-functioning, articulate, really nice person to hang out with. And a couple of years later he called me and he told me about his history, and then he told me that he had always suffered with flashbacks, but now his flashbacks, which used to be once every month, were happening multiple times a day. So he was no longer able to work or to function or to really leave the house. So I asked him about his treatment, and he said that his therapist, who was operating under some catharsis model from the 1910s probably, had him build a soundproof booth that he would go into and basically go through the trauma over and over again and scream, by himself. And so over the months of doing this, his flashbacks just got worse and worse and worse. And so my idea about that was that the treatment wasn't really treating him, what it was doing was re-traumatizing him every day. All he was doing was reverberating in this…you know, he was just flush with adrenaline, and his brain was constantly in this post-traumatic state. So he comes into my office, and we just had this one meeting, because it was a consultation; he comes into my office and he was describing the flashbacks to me, and as he was talking about them he said, "Oh, it's happening! It's happening!" And he started having this flashback that involved being beaten and sodomized and burned simultaneously. And he rolls off the couch onto the floor.

Now as I'm watching him in this state, I realize he's not all here. Most of him is not here in the room with me. Most of him is living in the activation of this procedural memory process, going through this thing moment by moment. Now, what I had heard and read…there was a study that showed that if you take someone in a flashback while they're having the flashback and you scan them—so, you put them in a scanner, you induce the flash-

back through stimulus material, and they start having the flashback—what you find is a highly active right hemisphere, because the right hemisphere is more biased towards very high states of terror and very low states of emotion, shame and withdrawal, and the left hemisphere stays relatively stable; it doesn't get hyperactive or anything. Well, what the researchers found was that there is active inhibition of Broca's area during these high states of arousal. So there was probably some sort of an evolutionary selection for the inhibition of speech during high states of arousal that might be related to the startle response to avoid detection and to basically stay still and look around, that speech was the "frozen terror" that the PTSD researchers talk about. So this was in my mind as I was sitting with this person I really didn't know who was on my floor having a flashback. So what I did was...of course, in truth, I didn't know what the hell to do [*Dave laughs*] but, you know, you do stuff and then in retrospect you think, "Oh my God, how smart I was to do that." But at that moment you just try to get through the hour. So I kneeled down on the floor, not too close to him, but what I did with this conceptualization; thinking about Broca's area being inhibited, what I want to do is stimulate Broca's area and introduce into this memory instantiation that's being re-patterned, some activation of an internal narrative. So I just started repeating my name, his name, where we were, what the year was, that what he was experiencing was a flashback, that it wasn't happening now, this is a form of memory. And then once I ran out of all those things I kept saying, I would just start again and do the loop. So I did this for about ten minutes, and then he came out of the flashback, and he called me subsequently a few months later and he said he took my advice, he got rid of the box and stopped inducing them, and that his flashback...that part of the flashback now included my voice, and he could hear me talking and he would talk to me during the flashback, and the more he could develop language, the less intense the flashbacks were and the less frequently they were happening. So the theory about this—and that's based in neurology or what we know about neuro-anatomy—is that as you develop a narrative, as you activate frontal functioning and parietal functioning in the context of these flashbacks, what you are doing is you are able to build descending circuitry to the amygdala and other brain structures that activate arousal and slowly gain some control. So the narrative, the construction of a narrative, helps us to build this descending circuitry to inhibit or modulate amygdala–hypothalamic activity and those sorts of things. So would I have done that same thing had I not had this knowledge or had these ideas from neuroscience? I might have, but I don't know. But the neuroscience provides the conceptualization like any other theoretical conceptualization about what to do, and then you get to test it.

Dr. Dave: OK, boy that is a great story. And I suppose that it definitely goes toward answering a question that you posed in the book, where you said, "How much do we really need to know about the brain to help us in our work as therapists?" At this point, what is your answer to your own question?

Cozolino: Well you know, I think I've had in my life the good fortune of having some really good therapists, and I don't know whether them knowing about the brain would have made any difference in the quality of the care they provided to me, but maybe I'm not the person who needed that level of explanation. But if you're dealing with people who are borderline, or have extreme PTSD, or have psychological illnesses, or psychological difficulties that are so biologically and neuroscience/anatomically-based, I feel it really helps to have the explanation. Clients that I have who refuse to take medication because they are frightened, with a biological explanation, and especially tying the biology to their early experience—in other words, if you have a lot of early maternal attention by someone who is calm and centered and caring, you have higher levels of serotonin. You have a higher level of endorphin receptors in your amygdala. The parental relationship builds a brain with a much higher threshold for panic attacks or arousal or anxiety. And so if you can tie early experience to the ameliorative effects of psychopharmacology, pretty much like diabetes or some other chronic illnesses that you have to regulate, people are much more open to experimenting with the psychopharmacology. And if it helps them benefit from therapy, then it's wonderful.

Dr. Dave: Yes, so I gather you're not opposed to medication as part of therapy. Where do you see the balance now and in the future between medication and talk therapy?

Cozolino: Well, I really think that talk therapy as a biological intervention...because we know the mechanisms of action now, and I don't mean to be unromantic in that way, but to me it's like, with every case you have to make a decision about it given that person's defenses and brain and life history—

what's the easiest way in. Because it may be that talk therapy has to happen first, and then pharmacology comes. Or vice versa. For some people, they need the proper medication before they can benefit from talk therapy. Some people don't benefit from talk therapy at all. And so every brain is an experiment of nature, and so every client is a new research project.

Dr. Dave: Yeah. If I recall correctly from my interview with Jaak Panksepp, I think he said all these psychotropic medications that are currently in use were discovered by accident. They were initially used for some other purpose and then discovered to be helpful for this or that psychological condition. And he suggested that new medications need to be developed using the latest findings from neuroscience.

Cozolino: That sounds nice. (*laughs*)

Dr. Dave: It sounds like the way it should be. As I recall, he said that actually the big drug companies aren't doing the research and development on new psychoactive medications because it's way too expensive. I think mostly for cost reasons they're not doing that research, so he started his own project along a certain line where he's trying to get a study going.

Cozolino: Well, there are certainly a lot of medications like…I think one of the things that has been explored is the effects of oxytocin. I think that's a possible source of an array of medications that might be helpful in anxiety disorders, borderline personality disorder—you name it. So I'm hoping that there's a lot more work in that area. And I don't know whether it's just that I'm a child of the 60s, but I would imagine that certain mind-altering drugs like LSD and other things might actually be helpful in structured environments with certain types of treatments.

Dr. Dave: I was just going to ask you that. That certainly seems to be the case to me. I mean, you talk about oxytocin, which is associated with feeling good, with good states, and then there are all these other psychedelic and psychotropic drugs that, in conjunction with skilled leadership creating the right environment, could be used in very positive ways. And actually I've heard from listeners that there are ongoing research projects now investigating that sort of thing after getting closed down in the late 60s, that there is that kind of research beginning to happen again.

Cozolino: Well I think that what's happening, is the young people are doing their own experiments; I think they're called raves.

Dr. Dave: Are those still happening?

Cozolino: I think so, yeah.

Dr. Dave: One of my kids was going to raves when he was a teenager, but that was some time back. So I'm wondering, you've written—I don't know how you find time to write the books that you write with your teaching and your therapy practice—I'm wondering if you see future therapists as needing to learn a lot more about the brain, and if that means licensing exams are going to get a lot harder.

Cozolino: Well, I would hope that knowledge of the brain becomes a standard of care as we move toward more interdisciplinary work. The big pharma and insurance regulations certainly have their hands around the throat of mental health care, and so their goal is going to be pushing for more efficient treatments; they're always going to be pushing for pharma over psychotherapy. I think that we have to be knowledgeable in that, in order to do the best we can do. I think that the problem is that the field of psychotherapy is becoming more and more of a paraprofessional field, and so the levels of training and the standards of care are naturally going down, which is kind of unfortunate, but there's maybe a balance between the value of the information and the power of the interventions we can develop to counteract some of that process.

Dr. Dave: Yeah, something you just said kind of gives me a new take on this work. It's that all these findings that psychotherapy, or talk therapy, is a biological intervention, as you said earlier, really kind of give us a tool or a weapon to fight back against the heavy pendulum swing towards the medical model.

Cozolino: Well, we still are dealing with costs. Especially if we have any kind of universal mental health coverage, costs are astronomical. And so we'll always have that pressure of having the most leverage for the buck. So, you know, all of these are really important questions. But I think the level… on the one hand, there are more paraprofessional therapists; on the other hand, we are going to have to raise our game.

Dr. Dave: Well, I wonder if there are any other points that you would like to make.

Cozolino: Just to talk about my book that just came out this last week called the *Social Neuroscience of Education*. I've taken the work that we've been talking about and applied it to the classroom, and so what I'm talking about is the relationship between a child's ability to learn and the quality of their attachment relationships with their teacher and the class and within the social milieu of the school, because these things are so intimately related, just as they are in the psychotherapeutic context. So I think the neuroscience isn't just going to be applied to psychotherapy. It's now expanding into these other fields, and I think it's expanding into business and a number of other areas. So I think what we're learning about the brain is going to have real implications for policy in a number of different fields.

Dr. Dave: I really think you're right about that. One of the other hats that I wear is that of a market researcher, and so I'm hearing about other researchers who are putting people on an fMRI machine or some kind of device and showing them advertising to see how the brain reacts and where the hotspots are in the advertising. It raises ethical questions for me of how intrusive are we allowed to be in figuring out how to influence people.

Cozolino: Well, that certainly is a huge issue. On the other hand, too, there's the issue of really understanding the differences in brain functioning in certain parts of the public arena. For example, last year there was research that came out of England that's showing the difference in brain activation between conservatives and liberals when they're presented with social issues. And where the conservatives have...I think it's right amygdala activation when they're dealing with social issues. Liberals have anterior cingulate activation predominantly. So you have the difference between fear activation in conservatives and a sort of relational activation or attunement activation in liberals. And you get a sense...I mean it's always in front of us, but you get a way of looking at it that helps us say, OK, yeah, this is why Karl Rove was so successful in elections gone by. The axis of evil, the fear activation—you can rally people around that, but you can see an alternative with Obama rallying people around compassion and thinking about sharing resources. So you know, our politics are also embedded in our evolutionary history, and so all of this stuff just gives us another window and a deeper way of understanding what's all around us.

Dr. Dave: Now, the book that you've just come out with on education, does that offer practical solutions for teachers?

Cozolino: I think, in a similar vein as my work in psychotherapy, I think the purpose of this book was to support teachers in what they know already, which is that students need individual attention, they need emotional connection, and you can't run a school like you'd run an industrial factory. You know, kids aren't chicken nuggets or microwave ovens, and teachers aren't assembly line workers. And there's so much pressure on these standardized tests and all these other things, because the educational system is kind of an oxymoron in some ways, it is so problematic; so what I wanted to do was provide teachers with the scientific literature that supports their stand that they are human beings and they need to have relationships with other human beings. That's what *The Social Neuroscience of Education* is about.

Dr. Dave: Well, it's been great talking with you, Dr. Louis Cozolino. I want to thank you for being my guest today on Shrink Rap Radio.

Cozolino: You're very welcome, thanks for having me.

This interview is an adaptation from the Shrink Rap Radio show #336, "*The Neuroscience of Psychotherapy with Louis Cozolino, PhD.*", as interviewed by David Van Nuys, Ph.D., aka "Dr. Dave", on the 30th of January 2013.

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