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Developments in Neuropsychotherapy with Pieter Rossouw
David Van Nuys, PhD, a.k.a. "Dr. Dave," interviews Pieter J. Rossouw, MCLin
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Dr. Dave: Shrink Rap Radio number 383, Developments in Neuropsychotherapy with Dr. Pieter Rossouw.

Announcer: It's Shrink Rap Radio. All the psychology you need to know and just enough to make you dangerous. It's all in your head. Now here's your host, Dr. Dave.

Dr. Dave: On today's show, I'll be speaking with Australian psychologist, professor and author, Dr. Pieter Rossouw, about his pioneering work in the emerging field of neuropsychotherapy.

Pieter J. Rossouw, PhD, is the Director of the Mediros Unit for Neuropsychotherapy, a company that provides training in neurobiology and neuropsychotherapy. He also teaches at the University of Queensland in the School of Psychology and the School of Social Work and Human Services, and is the Director of the Master of Counseling Program. Currently, he is involved in full-time teaching and research in the fields of neurobiology and neuropsychotherapy as well as clinical training for clinicians, psychologists and general practitioners.

Pieter has been in private practice for the past 25 years. He holds Honors Degrees in Philosophy and Psychology, a Master's Degree in Clinical Psychology and a PhD.

Pieter specializes in neuropsychotherapy and is an expert in anxiety and mood disorders. He has published five scientific books and 50 scientific articles. He has been involved in research in extensive clinical trials and presented research papers at 40 international conferences worldwide. He is passionate about teaching, and in 2012 was the recipient of The University of Queensland Faculty of Behavioral Sciences prestigious award for Excellence in Teaching. He provides global leadership in counseling and is invited on a regular basis as a keynote speaker at leading international conferences.

Now, here's the interview. Dr. Pieter Rossouw, welcome to Shrink Rap Radio.

- Pieter Rossouw: Thanks, Dave. It's lovely to catch up with you from the other side of the world here in lovely Brisbane, Australia.
- Dr. Dave: Yeah, really. Because of the great distance, we're lucky to get connected. I know we missed each other once because I think our time calculations were off.
- Pieter Rossouw: Yeah, it's a bit tricky with all the time zones and the Eastern Standard Time and Pacific Time to find a mutual timeslot that works well, but yeah it's lovely to catch up with you.
- Dr. Dave: I think the thing that messed us up before I think figured it out was that we were on Daylight Saving Time, and I don't know if you have that in Australia.
- Pieter Rossouw: True. We do have Daylight Saving Time in Sydney, which is a bit south of Brisbane, but for some reason the Queensland where I'm situated does not have daylight saving which does cause confusion even within the country.
- Dr. Dave: How strange? How strange? You and I are both on the Advisory Board of the Neuropsychotherapist and we've not had a chance to ever meet in person, but hopefully may be at some point that will be able to happen.
- I'm going to base some of my questions at least on some of the articles that you've published there, in as much as those were the easiest for me to access of your very extensive writings.
- Pieter Rossouw: Sure, that will be fine and, yeah, I look forward to catch up in person at some stage. I have an invite to do some lecturing in Texas next year, so I'll be in the U.S. in April. We may just make some time to see each other in your neck of the woods.
- Dr. Dave: Okay that would be good, although I must say Texas is quite a ways away from where I am.
- Pieter Rossouw: Yeah, but probably on my way to Texas need to stop over in California.
- Dr. Dave: I'll look forward to that. I think a good starting place would be for me to ask you about your view, about your understanding of the term neuropsychotherapy. What is neuropsychotherapy? Is it the same as neuropsychology? What's the difference between psychotherapy and neuropsychotherapy? That's a whole lot there all at once.

Pieter Rossouw: Sure, Dave. That's a very relevant question because the traditional field of neuropsychology is a well-established field and traditionally at our unit, we focus in neuropsychology, a bit more on the injuries that's related to head trauma, brain-related trauma. As a result, the field of neuropsychology has a very strong emphasis on assessments of brain-related injuries and assessment of cognitive wellness, cognitive impairment, the ability to perform well as the result of some areas of the brain that's being compromised either developmental or through trauma or through some genetic variations.

The field of neuropsychotherapy is a relatively young branch of psychology that's focuses on neural signs. The difference is that neuropsychotherapy seems to focus a bit more on the advances in cognitive neuroscience especially in neuroimaging. The question was posed a number of years ago and has been more and more one of the research questions for huge numbers of researches, how do we apply the principles of neuroscience on a day-to-day basis when you work with clients.

One of the more popular terms that people use is the word brain-based therapy, which can actually cover ... It's an umbrella term for a huge number of therapeutic approaches. Neuropsychotherapy is basically the underpinning of the utilization of the principles of neuroscience on a day-to-day basis for significant number clinicians in various fields of mental health work to assist their work to enhance outcomes for clients from a brain-based perspective.

Dr. Dave: That's very helpful. That is a very useful clarification of terms. Some people are going to wonder, how is this not old wine in new bottles? In other words, is neuropsychotherapy being reductionist somehow or is it rather fostering a more holistic approach?

Pieter Rossouw: That is such a good question. The word neuropsychotherapy can be a bit misleading. People tend to ... If you're not acquainted with it or think about neuropsychotherapy as we do psychotherapy and all we do is try to understand what happens on the neuro level, how neurons talk to each other, what happens with cortical blood flow, what happens with certain changes in neurochemicals and as if that can explain the essence of who we are or what defines us. Eventually, it becomes what some people may refer to as a reductionist approach.

In fact, the interesting reality is that neuropsychotherapy actually points exactly to the opposite direction, its understanding how brains

interconnect with each other, the neuroscience of neuro-interconnected list. We can talk about this later in terms of mirror neurons connect brain to each other, which imaging studies show quite clearly these studies. From the understanding of how brains interact with each other, it's much more of a holistic approach, understanding the entire interplay between the individuals.

Through that interplay, it's not just a language interplay. It's not just a sharing of cognitive information. It's one person listening to the other and you see the other person head going up and down and you realize there's a connection there. Sometimes the person opens his or her mouth and go, "Ah, get it," and you see that light bulb going on. That's that interconnection and it's through that interconnection that we facilitate a process of neural change, which means when a therapist talked to a client it's that real connection that facilitate the change.

Through this there's some cognitive activation and there's some understanding, but it's this really interplay between individuals in a specific environment that's in a nutshell the essence of neuropsychotherapy.

Dr. Dave: I'm going to play devil's advocate a little bit more here, because one can say, "All of that was going on before when we just called it psychotherapy."

Pieter Rossouw: Oh, that's absolutely correct on many levels, but we this as what's being around for a long time is now just demonstrated on the neuro level as well. The big shift and the benefits of focusing on how this interplays on a neuro level is a lot of the work of even ... let's go back to the early days of the modern psychotherapy science with people like Freud and [Jungman 00:10:28] and Adler. If we go back to what these people have identified, they have been spot-on on many of their observations.

However, modern neuroscience has established a different portal to understand some of these changes on a neuromolecular level and it also provides a lot of scientific evidence to what's being around for quite a while. I'll give you one more example. Many years ago, the Brit John Bowlby identified the importance of the attachment relationship, the relationship between the primary care and individual and how that sits the trajectory for either mental wellness or unwellness [crosstalk 00:11:13].

With modern neuroscience, we see how attachment facilitate health in neural proliferation and how to compromise the attachment relationship, facilitate higher activation of the fear response system through the HPA axis in the brain, the hypothalamus pituitary adrenal system, how someone gets a higher quick startle response due to that activation, how someone is just more uncomfortable to engage in new situations. You see that neural changes that is clearly identified through something that was being hypothesized than being theorized a number of years ago, so it's just a closer link between the more traditional hard core sciences and what has been around for a while.

The other benefit is it's not just a demonstration of this. Neuroscience seems to help us with how do we approach clients. I'll give you one example. One science demonstrated that the brain develops from the bottom to the top, from the brain stem areas to the smart top part of the brain, the cortex area. That development from the bottom to the top means that unless we feel safe, unless we feel comfortable in an environment our learning is compromised.

For therapy that means unless we have a very solid relationship with the client, the client feel I can breathe, I felt safe, I can share my secrets, I can share my discomfort, I can share my trauma that facilitate new neural activation. If that is not effectively addressed, the clients feel uncomfortable and therapeutic process is compromised. On those levels, I think neuroscience is helping us tremendously towards new outcomes.

Dr. Dave: That's a great example. By the way, feel free to throw in any other clinical examples that come to mind that will help to concretize these concepts to help people understand what we're talking about. I'm impressed that you're so smart about all of this. Because it is so new, I'm wondering if may be you had to retool yourself since graduating from graduate school. What's your background and how did you come to be an expert in neuropsychotherapy?

Pieter Rossouw: My background is I completed my studies quite a few years ago in South Africa, where we did a combined neuroscience and a clinical Master's degree. After I graduated did a PhD and work for a while in Holland where I finished this. After the PhD, I started on private practice and I was also teaching as a professor in Clinical Psychology in South Africa.

One of my friends in the early '90s was a neuro-oncologist. One day, we were having breakfast out of the private hospital's area. We had a breakfast and he said to me, "My new head scanner is arriving today,"

and he was very excited about his new latest edition head scanner. I said to him, "Would it be possible for you to do some brain scan for me? I would like to see what happens in the brain of my clients when I do therapy."

He was a bit surprised and he said, "Do they have cancer?" I said, "No, no, no. Not as far as I know, but there are mental health issues. There are some early indications that if we talk to clients it may just facilitate not just changes in the emotions and behaviors and their cognitions, but I actually facilitate changes in the hardware of the brain." He said, "Let's have a look." This is how it all started for me.

I remember looking at our first head scan the client was doing some work for us and he said to me, "What are we looking for?" I remember my first comment was, "I had no clue but it's really nice picture." This is how things started in the early days more than 20 years ago. I said to him, "We probably need to look at the limbic areas," that's probably the area that gets more activated when the client gets anxious and when the brain activates high levels of distress.

Lo and behold, we see how cortical blood flow shift from the frontal systems of the brain when people get anxious and to the deepest centers of the brain into that kind of changes. I do realize something is happening in the deep parts of the brain the so called limbic system and the frontal part that's called the smart part of the brain tend to become a little bit pushed to the side and that compromises client's ability to think clearly. It compromises their ability to problem solve effectively.

As we all know, it happened to us on a day-to-day basis. Suddenly, we were in a hurry. We need to find the car keys and we go, "Where is the car key," and we get really, really anxious and your partner goes, "In front of you." You just don't see it and the reason for that is the visual cortex, the [pattern of processing 00:16:42] is compromised due to the anxiety. It's those kind of things that happen in the brain and once the brain experienced these kinds of distress on a regular basis, it gets hot-wired to activate in the slightest hint of a memory trigger that links into distress kicks in. As a result the brain wires itself to protect itself, but the ability to proliferate and to thrive is compromised.

Dr. Dave: You mentioned getting some of your important graduate training in South Africa and I'm blocking on this very important interview we have named, but the fellow in psych in South Africa who's very noted for his work on neuropsychanalysis. Do you know who I'm referring to?

Pieter Rossouw: Dave, there are quite a few actually that did some spectacular work in this area.

Dr. Dave: He owns a winery. It helps.

Pieter Rossouw: Oh, interesting. I'm not sure who you're referring to. Of course, there are more well-known South Africans, people like Fritz Perls who's been around for a number of years and then eventually ended up with the [Gustav 00:17:56] Therapy in Institute of New York.

Dr. Dave: Not him.

Pieter Rossouw: I'm not sure who is the guy with the winery that you referred to.

Dr. Dave: I cannot believe that. You can tell me how to fix my ailing brain that keeps getting things. Mark Solms is who I was referring to.

Pieter Rossouw: Oh, Mark Solms, yes of course.

Dr. Dave: I just wondered if he was part of the program that you studied in. I don't know what the age difference would be.

Pieter Rossouw: [Down in an area 00:18:28] that's called the Western Province or the Cape Province, which is probably as far as Texas from California.

Dr. Dave: Ah, okay. Let me ask you another question. I'm skipping around a little bit here. Where do you see neuropsychotherapy going? What's the promise of it?

Pieter Rossouw: I think the big promise that we see is that neuropsychotherapy provides an additional layer of scientific evidence to a huge number of therapeutic approaches. What you'll find is it approaches right through from the spectrum from the behavioral sciences to the cognitive sciences to the analytical sciences. The approaches all have some very significant links to how the brain operates, because at the end of the day we are all working with the same individual with a neural network.

On that level, I certainly found this in the last four years with the training. I'm doing internationally [inaudible 00:19:38] in the Asia-Pacific rim that clinicians from a huge variety of clinical backgrounds tend to attend my workshops and say, "This is the missing link that I was always ..." I knew it was there, but I didn't have the scientific background to understand why

I'm doing what I'm doing. It does provide that additional layer to clinicians.

On the second level, what I also found is that a number of clinicians say to me one of the big benefits is as soon as they explained to clients the reason why you're thinking like this, the reason why you have these feelings, the reason why you struggle with certain emotions or struggle with flashbacks due to trauma, is also because there are some changes that happen in the brain. The good news is the brain can rewire itself. These clients unless of a sense of stigma, unless of a sense of I'm doing for the rest of my life rather than provide them with the sense of understanding and the sense of hope and that's I think the biggest benefit of neuropsychotherapy is.

The advances in neuroscience indicate to us we have huge capacity. Just to give you one example, in recent research Japan with clients who were diagnosed with terminally-ill cancer consented to have their brains injected with an isotope that colors the tip of the motor cortex. They taught these four gentlemen new strategies that they've never done before. One of them never knitted in his life and they taught him to knit.

A few days later, over than weeks, all four of them passed away and autopsy showed that there were brand new neurons established in those days before they passed away, which demonstrate the brain's capacity to ongoing build not only new neurons but also new neural connections and new neural pathways. The concept of plasticity it's so powerful to demonstrate it.

We are not to use the Australian word [baggott 00:21:51]. We can change and we have the capacity to do something about the discomfort that we experience.

Dr. Dave: The Japanese study that you just referenced, it sounds like those changes showed up rather quickly.

Pieter Rossouw: Yes, yes. Neural connections and the establishment of new neurons can happen within days, but facilitating new neural highways take a bit more time due to the ... It's not just neurons that connect. We need the support cells, the glial cells that support these connections and therefore glial cells to support this and eventually to establish a strong neural highway that's the challenge. That is the very reason why neuroscience demonstrated to us.

If you have a client and you explained to him what went wrong, why we get rigid flashbacks or why we do experience some distress and the penny drops and the client go, "Oh, I had a moment that the light bulb is gone on," it does not mean we have changed their behavior, we have changed their feelings. We need a bit more work. Reason for this is to have the initial light bulb moment. It is a good start, but we need a bit more work to help the brain to activate that pattern as a default pattern and not as incidental pattern.

Dr. Dave: You may have already covered this, but one of the things you've written about is a new paradigm shift in understanding the brain. When you say a new paradigm shift, how was the paradigm? What was the old paradigm I guess and what's the new one?

Pieter Rossouw: I'm so glad you ask this. It's actually a fascinating shift that was quite clear for ... This paradigm shift slowly emerged over the last 130 years. There are actually three paradigms. The oldest paradigm of understanding the brain in one science was a paradigm that's been identified in the late 1900s by people like Ramon Cajal and then Julius Bernstein and Wilhelm Waldeyer. They've identified the brain as not just a mass of tissue but actually consist of fibers. Waldeyer posts this theory that he said, "Let's call this cells neurons," and hence the birth of the circled neuron doctrine or the neuron theory.

Very soon after this birth, Cajal and Julius Bernstein identified that the brain cells actually have an electrical current. This electrical potential runs from the one end of the neuron to the other end in one direction, and even identified the true measuring. It's quite fascinating to think that someone can do this in 1902, identify the electrical potential of a brain cell that the risk in potential is minus 61 thousandths of microvolt; quite spectacular work.

He identified that for the brain to talk, one cell to talk to another. There has to be some firing process and it is the change of the membranes due to release of ions and those ion levels have changed, shift the electrical impulse from the one end to the other end, so the brain runs on electricity and that was the first paradigm is the electrical theory. As you know, the result of this was that if the brain runs under electricity, someone is unwell, what is the treatment use at the brain?

ECT has become the prevailing theory or therapy for all mental illnesses, especially severe mental illnesses that run on the paradigm of the brain as an electricity system. Then in the mid-'50s ...

Dr. Dave: Let me just insert here, in case anybody listening doesn't know what ECT refers to, electroconvulsive therapy or electroshock.

Pieter Rossouw: Electroshock, exactly. The theory was if you can shock the brain, we're not sure what happens and, interesting enough, to this very day we still don't know. It needs lots of research, but we still don't know exactly what happens when we run an electrical current through the brain. As you know, there has been severe side effects and that's for another discussion, another day where we can discuss how the hippocampus gets compromised as the result of electrical convulsive therapies.

The outcome of this was that most of them with severe conditions were treated by initially called bilateral ECTs, which means both sides of the brain get a shock that's released through the brain electron. Due to the severe side effect profile, people get memory loss and quite disorientated, confusion initially in the early days, people even died. They shifted to unilateral ECTs, which means only one side. Most of them is actually just the right side of the brain and there's less memory distortion, et cetera.

From there, other electrical systems were developed, like transcranial magnetic stimulation or using magnet, et cetera, et cetera. That's a different long discussion by itself, but that was the initial theory of the brain is the electrical theory and they're in the '50s. There's always some annoying research that come up with something new and a young research called [Henry Dole 00:27:54] and ... actually an Australian researcher. Henry Dole was American and John Eccles was an Australian researcher, a brilliant researcher who received the Nobel Prize in '64.

Those researches identified a substance called acetylcholine, which is a chemical substance that seems to activate like jumpstart the electrical process, so that changed the entire paradigm. Once this has been established, we realized that the brain does not run on electricity per se. It's not wrong but it's not the complete picture. There's a bit more and the brain also runs on juices or chemicals. Hence, there was a major shift away from the electrical focus to a neurochemical focus. In general terms, we refer to the initial group as The Sparkies, the group who will be electrician who focused on the brain as an electrical system.

Dr. Dave: I love that.

Pieter Rossouw: The new group is called The Cooks, chefs, the people who see the brain as a bowl of soup. The soup doesn't taste nice so all you need to do is add the right ingredients and soup will taste better.

Dr. Dave: Great, I love that. Hopefully, we'll remember that.

Pieter Rossouw: As the result of this, we see the birth of the brain of as a neurochemical process. Some people refer to this as the medical model. That's the model where someone is unwell; the first line of treatment is a chemical treatment because there's an imbalance in the brain. A lot of slightly old clinicians will still say to clients, "Oh, there's a chemical imbalance in your brain. You need to take some meds. Once you take meds, things will balance out then we can do some psychotherapy and things will really get better." That's the medical model. It's a model which focuses on the brain as a chemical system.

In the late '70s, again, there's a young annoying research called Eric Kandel and you probably heard the name.

Dr. Dave: Yes, we've been watching him on TV in a wonderful interview series.

Pieter Rossouw: The spectacular work that he did was *Aplysia californica*, which is sea slug. Eric Kandel basically ... [and I'll jump 00:30:22] because of something else. I'll get back to this in a second, but he was the guy who cracked the code for understanding how memory operates on a near molecular level, which is absolutely the spectacular work, and he received the Nobel Prize in 2000.

Eric Kandel always felt a bit uncomfortable with the chemical model of the brain. He wrote an article in 1998 which is regarded as probably the most prominent article that was published in neuroscience in 100 years. It still stands as the pivotal moment that changed the paradigm of neuroscience for the next 100 years. This article you can download it off any internet sites. You browse its public domain. It's called *The Intellectual Framework for Psychiatry* and it was published in the *American Journal of Psychiatry*.

In this article, Kandel wrote the following. He said, "We are in the midst of remarkable scientific revolution, a revolution that is about to change the way mental health will be viewed and mental illnesses will be treated for the future," which is quite remarkable for a molecular neuroscientist to make those kind of comments. Later in the article, he made the following comments. He said, "When a therapist speaks and a patient

listens, the action of neuromachinery in the therapist's brain is having an effect on the patient's brain."

Then he used the example. He said, "In so far as are words produced changes in the patient's mind, meaning the way we think he'll behave, it is likely that our words produced changes in the patient's brain." What he is saying there was talking physically changes the brain. A lot of his colleagues said to him, "This is academic suicide. You can't say these things if it's not proven yet." A number of years later, it was clearly demonstrated where nowadays [inaudible 00:32:40] of research that demonstrate how talking physically changes the brain.

That was the new paradigm shift away from the neurochemical model, the medical model, into a new model and this is what we refer to these days as the brain as a neuronetwork. It's all about network. It's not just a bowl of soup. Let's put it in a blunt way with one example.

Depression/anxiety is not a Prozac-deficient disorder, meaning, it is not just about a neurochemical. It's not just about adding a specific inhibitor of serotonin, which is the active substance 5-hydroxytryptamine that inhibits the membrane of the serotonin release. Once you do this, depression will disappear. It's about neurologic approach of who this person is in relationship to his or her entire environment and facilitating a new way of thinking, behaving, interacting in his or her environment, shifting the environment from a compromised environment to an enriched environment and that eventually facilitate a new way of wellness. That's the paradigm shift.

Your question it's a bit of a longwinded answer from where things were with the electrical model, which is not incorrect but not complete to a neurochemical model, which is not incorrect but certainly not complete to a neuronetwork model. We may have something more in the future, but this is where we are at this stage.

Dr. Dave:

I really got so much better an answer than I anticipated from that question. That was a wonderfully rich answer. One term that you mentioned there was something I had intended to ask you about. You spoke about enriched environment and I know that something that you've been studying is the role of enriched environments to change the brain. What has your research in that area been and what have you found out?

Pieter Rossouw: Let's start with the opposite. They're around for a very long time. We all know that this has been a general knowledge for a long, long time. When the environment is compromised, we are in trouble. Then when things go wrong, when we experience horrible distress, when we experience trauma, the brain changes and it has been well-demonstrated how trauma changes the brain, and there are few variables that we always consider.

The younger we are that trauma kicks in, the more significant the changes in the brain. The more ongoing trauma occurs, the more the brain changes. The more significant the intensity of the trauma is, the more significant we see changes in the brain. Age, duration and intensity are all very important indicators for wellness, but more importantly in terms of trauma, indicating the severity levels of trauma, so that's the downside. That's compromised environments or even to the next step up is when safety is totally [inaudible 00:36:03] and those kind of environments change the brain.

Take an example of someone going to war in the First or Second World War or go to Iraq and experience some nasty situations, life-threatening situations and that's the result of this. If it went off, there's a good chance of recovery. If it happens ongoing, the chance of recovery gets compromised. If life is threatened to some extent and if your response is so overwhelming, they can be quite significant even long term, even permanent changes in the brain. That's the compromised environment.

We very well are aware of this and we've seen this from the First World War where the first bomb-shock concept was born and eventually lead to the identification of a condition that we call posttraumatic stress disorder. It changes the brain.

Now we're going back to Eric Kandel. What he has demonstrated is if you provide this compromised environment to a sea slug, the sea slug's brain change and it changes permanently. Then he demonstrated if you can provide an enriched environment. We're getting to the term that you asked about. It can also facilitate changes and enriched environment in human terms are environments where certain conditions are met. We have identified at least four of these conditions and that's probably a discussion for another day. I can mention them briefly.

Dr. Dave: Yes.

Pieter Rossouw: The basic condition for mental wellness and for enriched environment is where we have an experience of attachment, so pure attachment. Meaning a child that grows up in a safe environment with a relationship with the primary care feels safe in his or her environment can attach with this bigger because that leads to neural proliferation. We see that the brain becomes very well in terms of its engagement in the environment. It's interested in learning, it's interested to engage, et cetera, et cetera and as a result we see huge neural proliferation.

By the way, that's one of my concerns about our education system in the west which is quite often a fear-based system and that compromises learning, but that's we're not to discuss.

Dr. Dave: We can have lots of discussions.

Pieter Rossouw: The second very important condition for wellness is the experience of control. We all need basic control, whether it's physical, emotional, behavioral we need to be safe in our environment, et cetera. Control is a very important part of wellness. As soon as our control gets compromised, we're in trouble and the more basic the control gets compromised. Let me give you one example.

We fall from a boat. We are in the ocean and we are not good swimmers. Suddenly, our sense of control is severely compromised because we can't breathe effectively. There's a high chance that we may not survive and hence not just a fear response but our entire survival is compromised.

However, when the boss walks into the office and say, "I need to see you," and he walks out. That also compromises control because that fear system of what this is about. Am I going to get fired? If I get fired, who's going to pay the mortgage? What will happen to my wife and kids? You see how the entire fear response system kicks in when control is compromised. That's the second important variable for our wellness.

The third one is the development of a sense of self-identity. Having a good sense of self helps us with negotiating obstacles through life. If we don't have that good sense of life, everything becomes very scary. The third one is the ability to avoid distress and to maximize pleasure. There are some neurochemical changes like dopamine release and et cetera that's very important to enhance wellness.

Those are the four conditions that we worked with as the core identifiers towards wellness, which is also very important to provide, and enriched environment.

Dr. Dave: One thing you said that sparked an interesting idea for me was you talked about the importance of the first one of attachment. Something that I recently was watching I think on television or movie or something, a documentary about PTSD, where there's this incredible bonding that happens between soldiers when they're in that life-threatening situation, such that when they come back to society they feel bereft and right now the idea that you've given me is that somehow attachment ... either they didn't have good attachment to begin with but somehow now they have new attachment of a very powerful variety, whether it become attached to their mates.

Pieter Rossouw: That's very true. The reason for this is there are actually two important variables. In an enriched environment where there is no threat, attachment is also fostered. We see a very good attachment in terms of wellness in life in general so we can engage, we can do all sorts of things and just due to the facts that we know we have a good attachment we go. We have family that we catch up with, et cetera, those kind of variables are important for us.

However, when we experience a life-threatening environment or a potentially threatening environment, the intensity of makeshift is so much more of a basic survival response that establishes a new normal for soldiers. When they've been in that situation for extended periods of time, the new normal becomes the normal and when they come back they actually experience sense of grief and loss.

The quality of what we have here is not nearly as significant as what they had. We see a lot of soldiers would say, "I don't want to be in this environment. I want to go back. I want to be in any environment to end this combat because that's where I really feel alive and where I feel there's a sense of makeshift and there's a sense of closeness." The downside is it may compromise just normal well human behavior, for example, having a family, go for a picnic, enjoy being together, enjoy the normal highs of life and not the highs that come with extreme risk. That's the stuff that slowly, slowly changes the brain.

Dr. Dave: Yeah, so it raises the question of how can that be changed. How can the brain be reprogrammed in a sense?

Pieter Rossouw: Absolutely and that's part of the areas that we work on this establishing a new sense of a healthy, normal folk lines and be able to identify not just the neural patterns but also the neurochemicals that often release when they engage in natural highs. At some stage, I can give you a number of examples in this regard, but that's again I supposed a topic-wide build.

Dr. Dave: We're going to have a new show called The Pieter Rossouw Show. I know you're going to have to go in a bit. I wanted to touch base with you on some research that you've done on bullying that would seemed to be in a totally different area but maybe it's not.

Pieter Rossouw: Sorry. I missed the word.

Dr. Dave: Bullying of kids getting bullied.

Pieter Rossouw: Yes. Bullying behavior unfortunately is a very sad reality of life, especially we see with school-age kids. It continues [inaudible 00:44:38] what we use the word for adults, especially in the workplaces, workplace harassment, and how that compromises the brain, what we've seen especially with younger kids. Again, remember the three criteria that I mentioned earlier; the younger, the more intense and the more ongoing. Those are the three very important indicators for impact on the brain, so the younger kids experience of rejection, even violation of his sense of safety.

When social systems get compromised, you think you have some [maintenance 00:45:13]. Suddenly you experience some nasty comments on Facebook or social media, and that has severe implications in terms of someone's sense of safety. The control gets compromised, the attachment is compromised, the sense of self is compromised, the sense of pleasure is compromised. What happens in the brain is as soon as we experienced compromised environments, we go in protection mode.

What happen in neural terms is the deep changes of the brain kick in the fear response systems and we go in survival mode and survival mode is quite often the mode of not engaging, hiding and that becomes a default neural pattern. So learning gets compromised, social interaction gets compromised, the ability to proliferate gets compromised and eventually it becomes a [Matt Leone's 00:46:07] condition because of the severity and the ongoing presentation of symptoms of unwellness that really compromises our neural system quite significantly.

Dr. Dave: Has your research developed any implications for intervention psychotherapeutically with the victims of bullying?

Pieter Rossouw: Yes and, again, we use the neuroscience principles of safety of attachment as the key guidelines and that means a tradition what we have seen in some ... let's use a school for example, where a child experienced some bullying. Years ago, the approach was it was a very harsh intervention to try to discontinue this and discipline the kids being involved with this and it just interfere results in the child who experienced the bullying to feel more afraid, more scared that something bad will happen as the result of the intervention.

So one realizes the approach need to be more much of a gentle approach where we empower the victim rather than disempower the victim even further, which is our traditional legal system. Something goes wrong and the police just take over and as the result of the process, the victim feel even less empowered. We need to find in terms of longer term outcomes at process where there's a process of empowerment, take it slower, engage, provide information, what do we need to do next, how we gain to address this and a slower more engaged process.

Also work with the perpetrator so that we can also facilitate some neural changes and effective changes for the perpetrators otherwise we build a society that is either right or wrong. As a result of this, we then really provide some effective shifts from what is not correct to more correct behavior. The intervention process I think has shifted quite dramatically due to the guidelines that we found from a neuroscience perspective.

Dr. Dave: I do know that you have to go and I really trust that may be we will have the opportunity to have some more conversations down the road. For now, Dr. Pieter Rossouw, I want to thank you for being my guest today on Shrink Rap Radio.

Pieter Rossouw: Thank you so much, Dave. It's lovely to talk to you and lovely to meet you, and good luck with your work.