Rethinking Trauma

Why Polyvagal Theory Holds the Key to Reclaiming Safety After Trauma

the Main Session with
Stephen Porges, PhD and Ruth Buczynski, PhD
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Dr. Buczynski: Hello everyone and welcome. I am Dr. Ruth Buczynski, a licensed psychologist in the State of Connecticut and the President of the National Institute for the Clinical Application of Behavioral Medicine.

We are going to be talking with my good friend, Dr. Stephen Porges.

Just in case you don’t know Stephen and his work, this is Stephen Porges and he is a research professor in the Department of Psychiatry at the University of North Carolina at Chapel Hill and also Emeritus Professor of Psychiatry at the University of Illinois in Chicago.

He is the creator of the polyvagal theory, and that is what we are going to be talking about today. So, Stephen, welcome – it is good to see you again.

Dr. Porges: Thank you, Ruth. Good to be here again. Thank you very much for inviting me.

Dr. Buczynski: Thanks for taking time to be with us.

The Vagus and Polyvagal Theory

Dr. Buczynski: Let’s recap by first talking about the vagus – the primary function of it in the brain and the body.

“The vagus is the major nerve of the parasympathetic nervous system.”

Dr. Porges: The vagus is the major nerve of the parasympathetic nervous system, and functionally it connects our brain to our body.

In fact, Darwin in his book on emotions in man and animals describes the vagus – he calls it the pneumogastric nerve – a very important nerve connecting the two most important organs of the body: the brain and the heart.

The vagus is a nerve that comes off the brain; it is a cranial nerve and it goes directly to the heart, but it also goes to many, many different organs.
The vagus is involved in the regulation of all biological processes like digestion. What is most important in thinking about the vagus is that it is not only a top-down, but a bottom-up nerve.

Eighty percent of the fibers on the vagus are sensory. Now that we are becoming very interested in brain-body, and mind-body relationships, the vagus is really our primary portal.

Dr. Buczynski: Yes, I agree – and that’s why we’re here. Now, your theory isn’t called vagal theory – it is called polyvagal theory. Tell us about that.

Dr. Porges: Let me just discriminate or describe two differences here. First, there is the neurobiology that is very well established, and then there is the theory.

The neurobiology includes the fact that we have more than one vagus – we have two vagi – two different types that evolved at different points of evolution.

This becomes extremely important because the roles they play are very different.

Dr. Buczynski: That’s the newer one?

Dr. Porges: That’s the newer one – and newer one meaning it is unique to mammals. We have to remember that mammals are very special vertebrates – they need other mammals to regulate their bodily states and to survive. This becomes part of a theme that we will get into.

Trauma disrupts the ability to relate to others and to use social behavior to literally regulate vagal function – to calm us down.

The second vagus goes below our diaphragm – it is sub-diaphragmatic – and we share this with many, many more current invertebrates like reptiles, even fish.

“80% of fibers on the vagus are sensory.”

“Our social nervous system is intimately related with this new vagus – and so is our breath.”

“Trauma disrupts the ability to relate to others and to use social behavior to literally regulate vagal function – to calm us down.”
These systems work in harmony to enable us to have good biological processes, but they also react to the world – we use them as defenses or responses to social challenges.

Now I am going to take a little segue. Most of us learned about the autonomic nervous system, and we learned that there was a sympathetic nervous system, which was our fighting drive – the fight/flight.

**“We need to think about is how we recruit different parts of our body to respond to challenges in the world.”**

We learned that there was the parasympathetic nervous system with the vagus – and they were in battle, and that is partially true, but not totally true.

What we need to think about is how we recruit different parts of our body to respond to challenges in the world.

If we are now talking to each other, and we are not in a dangerous situation, there is no real reason to stimulate our sympathetics to get us into flight/fight.

It doesn’t mean we turn them off – because our sympathetic nervous system is important to us: it helps blood flow and makes us feel alert and confident.

But we don’t want it to go into states of rage where we miss perceiving others.

In terms of our normal social behavior, we want to use this newer vagus, and now we get into the theory of the polyvagal theory.

The theory is that the hierarchy of how these neural circuits came into place with evolution is how we react to the world.

The evolutionary theory is that the oldest system was the sub-diaphragmatic, which creates a way of reacting and defending to the world that would just shut us down – like reptiles.

Reptiles freeze and immobilize to reduce metabolic activity; they go underwater and they stop breathing.

The next phylogenetic stage is a flight/fight system, the spinal-sympathetics, to mobilize.

Then mammals got this wonderful system, because they needed to interact with others – they got this new vagal system. This vagal system basically enabled those other systems to be choreographed into a homeostatic function.
When we have our good, new mammalian vagal system working, then sub-diaphragmatically, the sympathetics and parasympathetics can get into a nice dance and balance.

When we talk to people out there who are dealing with their clients, many of them have digestive problems – gastric distress or constipation – and that is because the sub-diaphragmatic system is not working.

When people are in states of flight/fight and fear or danger, they turn off the sub-diaphragmatic area and it immobilizes these systems. Then, if we use that old system as a defense system, we pass out or defecate.

The theory says that we can see these different neural circuits supporting different ranges of behavior for mammals – and of course humans.

How the Mind-Body Connection Impacts Medical Conditions

Dr. Buczynski: This gives a little bit of an example or explanation perhaps of why certain medical conditions can be so mind-body connected.

Dr. Porges: Exactly – and of course we live in a medically oriented world that treats end organs as if they can be treated independently from everything else.

We can talk philosophically, but we can also talk practically. I have been involved in medical education now as a professor in a medical school for the last fifteen or sixteen years, and you start learning that physicians are not very understanding of the role of the nervous system in terms of regulating the end organs, or the organs that they study.

When we use the term “nervous system,” we already have this connection between the brain and the body.

“We have a nervous system that is reading our body and is changing our brain based upon the feedback it is getting from the body.”

We don’t have an autonomic nervous system that is below the neck and a central nervous system that is the head.

We have a nervous system that is reading our body and is changing our brain based upon the feedback it is getting from the body – and of course our brain can down-regulate it.

We can talk about peripheral symptoms – and remember, we can start categorizing symptoms into super-diaphragmatic – above the diaphragm – and sub-diaphragmatic – below the diaphragm – in terms of the
clinical symptoms.

Tightly wrapped people who are highly anxious – they may have hypertension, or literally all the diseases of the upper part of the body – start utilizing this old vagal system as defense.

For our trauma victims and people who have suffered from chronic abuse – this sub-diaphragmatic system when it is being used to defend, which is often associated with psychological states of dissociation – you start to see fibromyalgia, digestive and bowel problems, and even difficulties in having sexual activity, even though they may want to. We see this in women – they may defecate in the act of having sex because that system is so true to being defensive.

The issue is that many of the clinical symptoms which are viewed within the medical world as being end-organ related – you go to a specialist – could actually be in part related to the neuroregulation of these organs. We could use the word psychogenic, or at least start at that level.

Once people start seeing these disease entities or these problems, they feel a lack of power; they feel that they have no control.

That is part of what this theory is about: to inform people that they’re not victims – they are part of the control system that enables them to adapt and survive.

Neuroception Through Prosodic Features of Voice and Gesture

Dr. Buczynski: Just to finish laying a bit more of a foundation, let’s talk about neuroception.

Dr. Porges: We can easily create this hierarchy where you have this new vagal system which is all about the face. The heart relates and relaxes, and it down-regulates all the sympathetic and adrenal responses.

Then we have a sympathetic nervous system that immobilizes, and that turns off the digestion and the sub-diaphragmatic – so we start seeing this hierarchy.
But how do we get these different circuits to work? How do we say: I really don’t want to shut down – I don’t want to dissociate – I want to be social – I want to be a nice person?”

Dr. Buczynski: Or try saying, “I don’t want to be scared.”

Dr. Porges: Right. Or, “I want to enjoy being on a webinar!”

Part of the model is to try to now understand those signals – profound signals. They have to do with utilization of the muscles of the upper part of the face, as a cue, and using prosodic features of voice and gesture.

I often ask people if they have a dog, and many say they do. Then, I’ll ask them, “How do you talk to your dog?”

Of course, they know how to talk to their dog – because if they didn’t, their dog would shut down and feel bad.

But they don’t generalize that process of talking to their dog to talking to their children, and they will articulate in a very bold, controlling voice to their children, as opposed to using child-directed speech or what we call “motherese” – intonations of voice – which they would use with their dog or cat – with any pet.

The way that the nervous system detects prosodic modulation of voice turns on the vagal system and enables us to calm down.

There’s a long evolutionary history of why that occurred. Mammals had to know when they were safe. They lived in dangerous worlds; they evolved in a world that was dominated by much larger reptiles and they needed to get the cues.

In a very interesting and serendipitous way, the intonation of a voice conveys to the other the individual’s
physiological state.

My wife studies prairie voles, which are fifty-gram mouse-like animals, and even these little prairie voles, when they vocalize in their audible range – which is ultrasonic to us – the prosodic features of their vocalization are correlated with the vagal regulation of their heart.

“When people are talking with prosodic voices, what they are really saying is I feel safe with that person.”

When people are talking with prosodic voices, and we say, “Look, I feel really comfortable with that person,” what they are really saying is, “I feel safe with that person.”

Neurobiologically and through neuroception, they are saying, “This person’s not going to hurt me. I’m comfortable.”

Dr. Buczynski: And that neuroception is in part related to their perception of the person’s voice.

Dr. Porges: It is not perception – it’s at a higher level than that. It is neuroception and that’s the reason I invented or created the word neuroception because perception didn’t work.

Perception involves too many cognitive qualities. Perception has to do with, “I perceive this – I can detect – I can identify – I can understand.”

Neuroception is well below the range of consciousness. We may meet someone, or someone may be watching this webinar and they say, “Look, here’s Porges – I think he’s a very nice and interesting person.” Or someone might say, “I really don’t find any connection with him.”

But what are the features that they are detecting in their nervous system that enable them to make that decision?

Often it is the prosodic features: how they use voice, how they use gesture, how they engage – it is like when we talked before about keeping the camera so we can make relatively reasonable eye contact.

“If we don’t make eye contact, it triggers something in our nervous system that makes us feel uncomfortable.”

If we don’t make eye contact, it triggers something in our nervous system that makes us feel uncomfortable.

It is extremely important to understand this – the biological reaction occurs first, and then we develop what I call personal...
narratives: we try to make sense out of how we feel. Often that sense of how we do feel becomes the powerful way that we live our lives.

The interesting part is that the features that we need to relax, feel calm, and be proximal with another person – prosody, facial activity, gesture – all these processes stop when people experience trauma.

They have great difficulty in enabling that proximity and that interaction. If you look at clients who have serious abuse histories, you see a lot of flat face and up in the top part of the face, there’s lack of expressive – no crow’s feet and no exuberance. Their voices tend to be monotonic.

We see a lot of overlap of social engagement system deficit on the spectrum of trauma and autism. It is not to say that they are the same, but in both those scenarios – both those diagnostic categories – there is a down-regulation of the social-engagement system.

Let me just clarify one thing: neuroception is our nervous system’s detection of risk in the environment. We don’t know what we are doing – it just happens. Then, if we become informed, we can make better sense of how our nervous system reacts.

**Impaired Neuroception**

**Dr. Buczynski:** What does impaired neuroception act like?

**Dr. Porges:** With impaired neuroception, even neutral faces and even positive faces may be rejected as if they are dangerous – encouraging and making it difficult for the person to engage.

I have a metaphor that I use – the TSA agent at the airport.

Functioning neuroception is your personal TSA agent. The metaphor’s our body, our proximity, to the airplane. If you don’t want any terrorists on the plane, you stop everyone from getting on the plane.

Functioning neuroception to a person who’s been traumatized is going to literally stop virtually everyone from coming close. That is their adaptive function: they are not going to get hurt.
But even though they’re not going to get hurt, they are not going to have that interaction which their bodies need: the interaction to regulate their physiology in the presence of another, or with the dyadic interaction with another.

**Trauma and Violations of Trust**

**Dr. Buczynski:** I want to get into the whole idea of trauma and trust. You have mentioned the profound impact that trauma frequently has on violations of trust, or feeling safe. Can you talk more about that?

**Dr. Porges:** It is very similar to what I was saying with the TSA agent: if a person has been injured, what is the best way of not getting injured? The best way of not getting injured is not to trust anyone.

This is what the social engagement system is all about – it is all about giving cues to the other of safety and enabling proximity. It is to trigger neuroception to make the other person comfortable.

If the other person was comfortable at one point and then got injured, that system is now going to be down-regulated; it is going to be tuned to not allow anyone else to come on board.

People who have been hurt – and this is not even metaphorically – but really hurt find it difficult to create relationships, even though on a cognitive level that has a very, very high priority in their lives. They desperately want relationship, but their bodies are saying no.

Part of what I am trying to do is to explain to an individual what their body has done.

Their body has not done something bad – actually, many times it has saved their lives. It has enabled them to really suffer without fighting back and that is very adaptive – you won’t get killed.

There are a lot of adaptive functions of surviving through immobilization or dissociation.

The question is: How is your personal narrative? How do you use
that information to see who you are? Do you see yourself as victim, or do you see yourself now as heroic?

I want to tell you a little story – I got an email from a woman who was in her late sixties, and she was telling this story.

She said that when she was a teenager, she was strangled and raped. She was telling this to her daughter, many years later, and the daughter was saying, “Why didn’t you fight? Why didn’t you do something?” The mother felt so embarrassed – such shame and she felt so horrible.

Then she said, “I read about this polyvagal theory, and suddenly I felt vindicated and I’m crying now.”

I was crying, too, just reading the email. But the issue was that she understood that what her body did was protective of her – it was something to be proud of – it was something to say that she was not a victim.

Our society treats people when they don’t fight – when they don’t mobilize – as if there is something wrong with them, as opposed to saying, “This really was the best neurobiologically adaptive response that you could’ve made, and it is fortunate that you made it. If you had fought, you might be dead.”

This is all about how we see our behaviors – how we tell our personal narrative.

**Dr. Buczynski:** Yes, and for the mental health folks, this gives us a biological explanation of the idea that we’ve been talking about with patients for years – “You survived in the best way you knew how.”

Perhaps that can help them feel really understood and, as you said, vindicated. Maybe they can celebrate that or feel respect for the courage they had.

**Dr. Porges:** Yes, it is all about being informed. If we superimpose that moral veneer where the culture says, “This is bad,” then we say, “I guess I was bad.” If we throw that away for a while and understand our neurobiological adaptive reactions, we start to see the advantages.
**How Neuroception Works**

**Dr. Porges:** The idea of neurobiological adaptive reaction is quite profound, and sometimes our neuroception shocks us – and I will give you a couple of other examples.

There was a CNN news report of a plane whose wings had been tipping back and forth, and the reporter went up to people on the plane after it landed and asked them how they felt, with the expectation that they were scared out of their minds... He went up to a woman and he said, “How did you feel?” and she said, “Feel? I passed out.”

Now, it didn’t mean that everyone on the airplane passed out, nor did it mean that she voluntarily passed out. It was that her neuroception went into that immobilization – dissociative reaction.

Other people might have mobilized and started screaming, and other people might have said, “Well, this is life.”

Now, I have a good friend whom I believe you have interviewed – Bessel van der Kolk. Bessel heard me talking about this, so he decided to ask his clients who had been airplane-crash survivors, and he reported that he had six or eight – half of them went into this shutdown response and half didn’t.

The important point to understand is that we don’t control the response: our body is making this decision – it is neuroception.

The important point to understand is that we don’t control the response: our body is making this decision – it is neuroception. The nervous system is making a decision, but once it makes that decision, we can understand what it did.

Now, my own personal story is about when I had to do an MRI – I think I have mentioned this to you before.

I had to go for an MRI. Being a neuroscientist, I was really enthusiastic – “I get to look at my brain – my colleagues are doing this.” I went in, got up to my nose, and said, “Wait a minute. I need some water.” Then, even after they brought me back and I got a little further, I said, “I’m out of here.”

The point was, my body, in the confinement of the MRI, literally went into neuroceptive response – I was in danger, and I had to mobilize. Of course, that was faulty neuroception.
Faulty neuroception is when the body picks up cues of impending risk—a life threat or danger. If it is a life threat, it is going to shut down—pass out.

There are people who pass out during public speaking, and it is not really that they get anxious—they just went, *whoosh* and they dissociate.

Functionally and basically, they have vasovagal syncope: the blood is dropping out of their heads. Somehow, their body is detecting cues of life threat, and of course the personal narrative is always about self-esteem or this or that, but it may not be—it may be some other feature in their environment such as confinement or isolation.

For me, it was being held down in the MRI and that shocked me. I fly a lot. I don’t like middle seats, but most people don’t like them.

Confinement is not really what mammals like. If we look at all mammals and you think in terms of basic stressors, one is isolation from other and the second is restraint.

*“If we look at all mammals, in terms of basic stressors, one is isolation from other and the second is restraint.”*

Just think of those two stressors in the world in which we live, and think about it, too, in terms of medicine and what we do to people in our care.

**Dr. Buczynski:** Yes, and I imagine you’ve had, through your recent personal experiences, a chance to see that close up.

**Dr. Porges:** Oh yes, and I’ll share that with you. I was diagnosed with prostate cancer, and I didn’t have some of the wonderful options of not doing anything, which is really what I suggested and the physicians didn’t appreciate that.

The biopsy showed some fairly aggressive cancerous tissue, so I was given the option of broad-beam radiation or radical prostatectomy.

There are a couple of things involved here—first of all let me tell you that I’m fine now, so I’m not asking for sympathy. I don’t mind empathy, but I certainly don’t need any sympathy.

The point is: when you get a diagnosis, and even when you’re well informed, you start shutting down. I was watching what happened with

*“When you get a diagnosis, and even when you’re well informed, you start shutting down.”*
the diagnosis: I got it in the legs – and people will know what I mean. I was on my way to shutting down and that was not a good thing.

Even though I was informed, there were still the *uncertainties* of medical diagnosis and the *uncertainties* of major surgery can be very disruptive. We don’t know how our body will respond – regardless of what goes on.

However, I had a strategy, and the strategy evolved over time. The first thing I did was to delay surgery until August.

Now, a lot of people who have diagnoses can’t do that – it bothers them too much.

But I delayed it to August for two reasons: the first was I’m a very much internalized person and I would have had to cancel several trips and this would have been very hard for me to do. As profoundly disruptive as the diagnosis was, the act of cancelling trips was almost as much.

I had to clear a calendar for three months, and I had never done that before, but I did it.

I continued to go on talks and I continued to interact with people – and the point was I was using my talks as a vehicle to connect with people. I was using my talks as my own therapy.

What I finally understood was that by the end of my series of talks – I had to give maybe eight or ten talks and that included a few European trips – I felt totally wonderful.

I felt that if life were to end, it would be okay because there was a connectedness. I felt good about my family – I felt good about my life. It was really quite an interesting model because it had no panic – I had no panic.

I also went into physical training for surgery and dropped a few pounds – I got myself cardiovascularly fit.

I also did some imagery CDs during the last couple of weeks.

I had the surgery two miles from where I live, and I can see the hospital from my office window here. I was in a sense among friends, and I had wonderful visualizations and ideas.

I’ll give you just the last part of this: I was on the operating table, and I talked to the anesthesiologist, and I said to him, “You know, it’s your job to keep me alive during this procedure.”
Dr. Buczynski: No pressure!

Dr. Porges: Right, no pressure. But the scrub nurse – and the reason I said that was after finishing high school, I’d been a scrub nurse and I had actually worked in the operating rooms so I understood the environment a little bit – and the scrub nurse, who was a male, said, “No, it’s all our jobs to keep you alive.”

I asked the anesthesiologist what my heart rate was – I was being monitored – and it was the mid-sixties. It was seven thirty or eight a.m. and they were going to cut me open... I was totally relaxed, and functionally suffered no pain except for the first day, which was from the anesthesia. But I was really fine.

“There were two dimensions: seeing the surgery as being a help, and the loss of panic—I had a re-conceptualization of my role as a human being.”

There were two dimensions here that were going on: one was literally seeing the surgery not as being a hurt, but being a help — that kind of conceptualization, and second was the loss of any panic—I had a re-conceptualization of my role as a human being.

Literally, what I had learned from this personal journey of giving talks and interacting with people was that the true value in life was connectedness with other people – I felt really good . . . so that’s my personal story.

Dr. Buczynski: And I’m so glad you’re okay. I actually had known about this for a while, but I thank you for sharing it – sometimes we define trauma in a limited way.

We define it as something that happens in war or in a car crash, or through rape or sexual molestation or being beaten. But there is a lot more trauma than that.

In fact, I think it would be important for the folks who are nurses and physicians think about whether that might be something to include in their own thinking and working with a patient who has had, let’s say, a myocardial infarction, or who has just had a diagnosis — whatever that might be – or is going through a procedure – and what that might be like for them.

Uncertainty and the Biological Imperative

Dr. Porges: Everything is linked to the issue of uncertainty, which is a part of disconnecting from other people. I’ve started using a new term – a new word – that is used by others in biology.
I’m talking about the **biological imperative** – what is the biological imperative for humans? It is to be connected to other humans.

When we go into surgery, and when we go into medical practice or medical procedures, what we forget is that the people who are administering the medicine are not automobile repairmen.

We are not a car that gets something pulled – the transmission doesn’t get pulled, and it is not repaired in the same way. We are not a machine – we are a system.

As we are watching, medicine becomes manualized – even psychiatry. It begins with the medical records – you go to a physician’s office; physically, they rotate sideways and start typing into the computer, as opposed to the interaction and the importance of being made to feel safe with the other.

So for me, what I really felt very grateful for in terms of the University of North Carolina medical system – was that the people were wonderful; they were engaging; it was a community.

When I lived in Chicago, which had good medical services, it wasn’t a community – it was like “in and out.”

I have friends still in Chicago, and they are professors and MDs and they’re this or that, and when they have medical procedures, they are alone. They may not really have met or talked to their physicians or their surgeons.

Being in a smaller community was very nice – it was nice to meet the people beforehand and have dialog with them.

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**Polyvagal Theory: Trauma and Attachment**

**Dr. Buczynski:** Let’s stay with this idea of engagement and connection, because I agree with you – it is so
important. Does polyvagal theory have anything to say about the relationship between trauma and attachment?

**Dr. Porges:** It would. If trauma disrupts the ability to feel safe with another, then all the roots and all the premises associated with attachment get ruptured.

“If trauma disrupts the ability to feel safe with another, then all the roots associated with attachment get ruptured.”

I guess the way to phrase it is like this: if there is a good, underlying developmental base for attachment, then a person has a buffer for trauma.

I don’t know if that’s been studied, but one starts to see the patterns of life. We see the development of people we’ve known from childhood, and some of them are no longer with us, but we see patterns in their lives.

We see them over a span – fifty/sixty years later – and what is remarkable is some of the strategies are still in place that they used when they were children whether or not they ever got informed by the behavior, or they were able to remodel or reorganize.

So what I’m beginning to see and think is that what we really need to do is inform ourselves about the disruptive things that may have happened to us – not to be angry or to blame, but to try to understand the strategies that our body has taken to adapt and to survive.

Then we can evaluate whether those are really good strategies.

This all folds back into what we could call our own personal narrative, and how we use that narrative either to modify our behaviors to be more compassionate, more loving, a more successful human beings, or we use that information to be more driven, more tightly wrapped, more aggressive, and more self-oriented.

What I’m really saying is that at some point it becomes our choice – when we get informed, we can make strategies to make ourselves feel safer.

**Dr. Buczynski:** But not necessarily by just *deciding* to feel safer.

**Dr. Porges:** Right, your point is extremely important because these are not voluntary decisions to be different; they are voluntary decisions to try to develop the toolkit or the neural circuits necessary to become
Let me play with this idea. Let’s say that we are driven – we are professors writing grants, writing articles – no time to talk to anyone. We have to get the next grant out and we have an MI – not surprising!

Then something happens: we start to understand that there is a neural connection between our brain and how it works, how our viscera and autonomic system work, and how our strategy has been to turn off the interpretation of our visceral senses – to turn off our body.

If we think about this, we realize that this is really limiting our life experiences. Can we recover? Can we build on some of the neural circuits that will enable us to live a richer life, or a more social life?

This really does get at notions of trauma treatment or trauma therapy, and the answer is that there are some strategies.

If we look at it from a decontextualized and neurobiological perspective, we can start saying, “It would be nice if this newer social engagement system with the myelinated vagus came on board, and it would down-regulate my natural tendency to become combative, defensive, or go into rage because I’m really doing that as an adaptive function or I have a history of shutting down.”

In a sense, we create a whole hierarchy. Let’s just say that I was shut down, I was restrained, I was abused when I was young, and my adaptive behavior is to keep moving because as long as I keep moving, I can’t shut down.

But if I keep moving, I can’t relate – I can’t enjoy – I can’t create relationships – and I really want relationship.

What we can do is we can understand that there is biology to turning down or down-regulating this mobilization defense system. It is all about the social engagement system, and it is about the myelinated vagus.

We can do some very simple, yet very profound exercises – and they can be breathing, because we can learn that the circuits that down-regulate the sympathetic mobilization can be triggered by stimulating the vagal afferent – so through slow, deep exhalations we can calm ourselves down.

But then if we take that model of slow exhalations – what is singing? It is slow exhalation. What is playing a wind instrument? It is slow exhalation.
What is talking with long phrases without interrupting? It is slow exhalations.

We can literally shift our physiology through social behavior, through playing music, and even listening to music, which will feed back and change how our middle-ear muscles work.

**How Singing and Listening Are Slow Exhalations to Calm**

**Dr. Buczynski:** I understand how singing – if I’m in the act of singing – is a slow exhalation, but how is *listening* a slow exhalation?

**Dr. Porges:** Listening is very special – listening is a portal to trigger the entire social engagement system.

We have to go back to talking to your dog or talking to your child or talking to your friend: if you use prosodic intonation of voices – the tone is moving back and forth – it triggers in the nervous system a neuroception of safety.

The portal to change physiology can be through breath, but it also can be through listening.

We’ve had some discussions about certain types of music before, but certain types of music do trigger a sense of safety. I remember in a previous webinar I talked about Johnny Mathis.

Recently, I was watching a documentary video on Harry Nilsson who had a beautiful tenor voice.

Now, he wasn’t the safest person but his voice was really beautiful and melodic, and the songs he wrote also carried and created relaxation. It is because our nervous system evolved to detect those modulations as safety.

When we know these things, we can create contexts to enable people to feel safer. This feeling safer *is* the treatment – it is a neural exercise.

Play is a part of the terms I use – we engage/disengage/engage, and that is another form of neural exercise.

**Dr. Buczynski:** What you just said is really important: feeling safe *is* the treatment. That might be a way to...
organize your thinking – whatever your profession is – whether you are in the mental health side or a physician helping someone who is very sick.

**Dr. Porges:** It is a powerful concept. I had a slide in one of my talks that said our nervous system interprets or defines safety much differently than the legal or cultural standards do.

For example, carrying a gun – having a principal walking around with a gun – may be a way of making schools safe from a legal point of view, but it certainly creates a culture that the nervous system doesn’t like to see.

Our bodies detect certain features of safety and we need to understand that.

Also, we need to remember that we live in a culture where people say, “It is really what I say and not how I say it that’s important.” But our nervous system says something different to us: it says “It is not really what you say – it is how you say it.”

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**How to Incorporate Music into Trauma Therapy**

**Dr. Buczynski:** Going back to the whole idea of music just a bit longer: how might a practitioner – and in this case I’m thinking of a mental health practitioner – incorporate music into the treatment of someone who has experienced trauma?

**Dr. Porges:** We first need to think about what to remove from the acoustic environment before we start talking about what to put into it.

“Low-frequency sounds are profound signals to a neuroception of danger and life threat.”

Low-frequency sounds are profound signals to a neuroception of danger and life threat. We don’t want our nervous system to be hyper-vigilant for danger and life threat.

First of all, we want our clinical rooms, our consultation rooms – to be quiet. We don’t want them to have low-frequency sound or low-frequency ventilation or even traffic noises. We don’t want these rooms near elevators.

We want the rooms to be quiet because the nervous system is going to be detecting these low-frequency
sounds as if there is impending doom — as if something bad is going to happen.

If you want the clues to this, just look at the masters of the classic symphonies where they basically relax the audience with the first movement by using lullabies — the voice of violins, the mother’s voice.

Once you’re feeling pretty good with that, they move the melody to lower-pitch instruments until you’re safe with that. Everything is fine in the first movement, but in the second movement, there is always going to be impending doom — monotonic with low frequencies.

The classical composers understood the profound impact of acoustic stimulation on physiology, and they created their own scenarios — their own narratives.

Now, a clinician can be as intuitive as well and start getting rid of the low-frequency sounds — which will be impending doom to the client — and then enable the individual to listen to vocals, especially female vocals, to help relax.

Acoustic stimulation in certain frequency ranges can be very comforting and calming.

Of course, we experience music as well — remember the sixties?

There was folk music, which was, again, extraordinarily prosodic. Pete Segar, who just recently died, was at the vanguard of this movement of singing songs of social change — these were important and serious songs.

However, they were put to music that was frolicky and light and people could sing along. People felt good listening — this was part of the whole tradition of folk music to convey ideas without scaring people.

So music can be used in the clinical setting. What’s most important for the clinician is to get rid of the low-frequency sounds, use prosodic voice, and if a person is gaze-averting or turning away from you, don’t force eye contact — they’re too scared already.

If they’re gaze-averting, they’re probably scared — people aren’t comfortable with direct eye gaze, but they will spontaneously turn toward you, once they feel more comfortable.

**Dr. Buczynski:** Stephen, if you are a clinician and you don’t have control over those factors — the ventilation in the building, or how close we are to traffic noise — what would you recommend?

**Dr. Porges:** I would recommend looking for another office. That would be my first choice. I don’t think we
spend enough time thinking about the physical characteristics of where we are delivering our services. The rooms themselves have therapeutic consequences.

If the acoustic stimulation where we see our patients is so profound and unambiguous to our nervous system, it is going to interfere with our ability to deliver our services.

A lot of people will put white-noise generators on; they will try to mask it – and that just ramps up the background information that the nervous system has to now process. People in that environment might appear to be hyper-aroused, when in a quiet environment they may start to become calm.

Actually, I’ve had several discussions with architects, and I have even talked at some architectural meetings about the notion of designing space for wounded warriors that would have a therapeutic effect – not just be pretty.

Architects are usually about appearance and the ability to monitor, if you are designing a hospital, and the ability to keep clean. What I’m really interested in is how well the architecture absorbs sound and makes the body feel.

So, to your point about what you can do – most offices have hard, wall surfaces where you can put wall hangings or put carpets on the floor – and these are both acoustic or sound absorbing.

Also, wall hangings can make a room feel safe and comfortable – that might be a good investment for some clinicians.

**Acoustic Stimulation to Activate the Social Engagement System**

**Dr. Buczynski:** For those who might struggle with some of our traditional therapies, are there other ways to activate the social-engagement system that don’t require face-to-face?

**Dr. Porges:** Yes, and that’s a very good question. I pondered this for years, and that is why I developed this whole idea of using acoustic stimulation.
I don’t like intrusive therapy – that’s my bias. Some people have models of intrusive therapies, and I tend to have this – it is very personal.

I have a very deep respect for the individual and I want the individual to engage, and if they engage, then it is fine to respond.

“I conceptualize reciprocity and reciprocal interaction as a neural exercise.”

If a person isn’t engaging and is away, you can start getting the portal going with the use of prosody – the use of modulated acoustic stimuli can be extraordinarily powerful.

I am going to give you another example – this was a friend of mine, a clinician who was going to introduce me at a talk for several hundred people, and on the night before, she was very anxious.

I always thought that was just her personality – very energetic, but at the party on the night before, she told me that she was scared about going up in front. It is interesting what a drink or two at a party will make someone say. I told her not to worry, “I’ll fix it.”

On the following morning, at ten minutes to nine – and the talk was at nine o’clock – she said to me, “Okay, Steve, fix it now.”

I looked at her and I watched how she was speaking: she was speaking in very short phrases with gasps. We all know people who talk like that – they are breathing on top of their phrases and it sounds kind of energetic.

I said to her, “Extend the duration of your phrases. Keep adding words before you take a breath.”

She couldn’t do it – she couldn’t get another word in. Finally, she got another word in, and then she got another, and then she got a long phrase – and then she went up and did this wonderful introduction.

She had a fear of public speaking – and she now uses this as a treatment for people with social anxiety.

There are ways, once we know the biology – and the biology of this was to get her to utilize breath through speaking – to emphasize and enhance the vagal regulation of the heart.

But there is another part of this: as the vagal regulation of the heart

“As the vagal regulation of the heart increases, so does the vagal influence on the larynx and pharynx.”
increases, so does the vagal influence on the larynx and pharynx. You start to get more melodic – you speak with a more prosodic voice.

So she started talking in a more engaging way. You start seeing this synergism and reciprocity begin to occur.

It is based on the simple model that even though you might have these difficulties, if we can literally trigger the physiological state, then the emerging platform for a variety of social behaviors starts to come out – without trying to train or control the social behavior. It is a different strategy.

**Dr. Buczynski:** To what extent do you know exactly what she does with her patients who have social anxiety – how has she transferred or applied that?

**Dr. Porges:** Basically, she is using the extending duration of breath while speaking – they are doing the behavior that gets them anxious in a physiological state in which they are no longer anxious.

> “If you start extending the duration of your breathing or your phrasing, your physiology is calming down.”

Again, if you start extending the duration of your breathing or your phrasing, your physiology is calming down, and the speaking that was the anxiety-producing event is no longer – it is sitting on a physiology of calmness.

There is another part that’s going on with that as well: the voice is changing: the voice is no longer squeaky – the voice is now more melodic. The voice becomes pleasing to the individual.

**Dr. Buczynski:** This has to be done out loud. Could it be silent?

**Dr. Porges:** Having been a musician, a clarinetist, at one time in my early youth, I would say that you can do a lot of things visualizing – without actually doing the behavior.

So, I could practice or rehearse without actually playing it. If I had to play a concert and I had to do a solo, I would visualize and play the music in my head. There’s a lot going on that can be both visualized and then merged with the actual behavior.

**Dr. Buczynski:** In terms of social anxiety conditions, I was wondering if people, when they are frightened, their brain freezes and they can’t think of what to say, and that would mean they wouldn’t be able to extend their phrases...because they can’t come up with what they want to say.

Could you have them count? Could you say, “Count as many numbers as you can before taking your next
Why Polyvagal Theory Holds the Key to Reclaiming Safety After Trauma

Dr. Porges: What you did when you demonstrated that example was a gasp. You actually got into a physiological state similar to what you were trying to describe.

If you go with that type of mentalization, then people might be supporting the physiological state that may be counter-indicative or counter-productive to what they want to do.

If you have them exhale slowly and literally count the time of exhaling, they may then become more engaged.

But if you do this type of gasping, you are going to get brain freezes – you are going to change your physiological state.

The model is simple: you’re turning off this vagal control system and allowing the sympathetic mobilization to occur, which is now preparing you for flight/fight, not for the social engagement – the dialog and the content.

I will give you another example. I had to give a talk at a conference on compassion. I was up there in front of these people, and they turn off the houselights.

I started trying to talk – talking without seeing people’s faces is like falling out of an airplane. I wasn’t getting any feedback. I didn’t know where I was and that was kind of paradoxical – this was a compassion conference.

I had them turn the houselights back on – my comment was, “I get nothing out of the talk unless I can see people’s faces.”

What we are really saying is that part of the interaction that people have when they are fearful is they are not getting anything back from the interaction – and there is so much to get back.

I guess we can tie this all together to what happens to people with trauma and the difficulty of no longer using their interactions with another person to regulate their physiological state.

In talking about anxious people and their interaction with others, they can’t use the interaction to feel better about themselves.

“Part of the interaction that people have when they are fearful is they are not getting anything back from the interaction.”
It is not cognitive — they are not feeling better about themselves because the strategies — they way they talk and the way they breathe — are supporting flight/fight behaviors, and they’re not getting the reciprocal interactions.

**Dr. Buczynski:** That’s fascinating. The ideas you just shared, and even the ideas about social anxiety and the treatment of social anxiety, that’s so important.

### What’s the Future of Trauma Treatment?

**Dr. Buczynski:** Stephen, where do you think the field of the treatment of trauma is going? What would you project or expect might be the most exciting parts — where might we be in five years from now?

**Dr. Porges:** It is clearly going more body-oriented — that you can see from all the people that you interact with as well. I sit in a very interesting crossroads because I’m not a clinician. But that has given me tremendous entrée of all these schools of treatment — whether it is somatic experience of Pat Ogden’s, or the work of Bessel van der Kolk — these people have found polyvagal theory useful in terms of explaining and providing a neurobiological validation for what they are doing.

The polyvagal theory gives us the ability to see the linkage between body and brain, or body and psychological process.

What we are going toward is more of an understanding of trauma as an adaptive reaction that, once it occurs, the adaptive reaction is adaptive only for a short period of time, and it literally gets stuck.

All the treatment models — whether it is somatic experience or sensorimotor psychotherapy as Pat calls it — they are all about trying to shift the threshold of shutting down and getting people more socially engaged.

They are all about shifting physiological state.

At the root of all of this, and where I’m going now, is the ability to use another person to regulate physiological state.
That is why I am back to this concept of biological imperative: we can’t survive well without interacting with another appropriate mammal. Trauma treatment may move to working with dogs – and I am involved with projects with that with the army on that but the issue is how do we get the nervous system to spontaneously engage another?

We need engagement to be healthy.

The future is far away from pharmaceuticals – and this is difficult because the medical profession is heavily pharmaceutically oriented.

Psychiatrists with their diagnoses are basically trained as applied psycho-pharmacologists, with the belief system that drugs can target the disorder that they are treating without the conceptualization that drugs affect feedback loops and affect many other systems as well – other than the psychiatric ones.

I think the future has to be away from drugs for the chronic – it might be useful for the acute, and there has to be to a greater respect and understanding of the complete feedback loops – we are not only body-brain but people-to-people in the regulation of body and brain.

**Dr. Buczynski:** When we think about the treatment of trauma, it involves trust, and a lot of the polyvagal theory is connected to helping people feel safer. I was wondering whether your work is used much by marriage and family therapists or even couples’ therapists.

**Dr. Porges:** This is very interesting.

The Erickson Foundation Couples Conference – I spoke to them and it is a several hundred people conference. It was a surprise to me that I was invited there. Next week, I’m doing the keynote plenary session for The American Group Psychotherapy Association. These are all new venues for me.

**Dr. Buczynski:** I’m thinking how one part of a couple might be severely injured in some way and responds to stressful situations by withdrawing, and the other part of the couple feels anxious and escalated, let’s say – that’s kind of a classic that we often see.

How could we teach the second person to behave in such a way that they could down-regulate the first person?

**Dr. Porges:** Yes, this is very tough, and I say that because I am both a husband and a father... and a mentor.

The ability to regulate one’s own behavior when being triggered or cued is extraordinarily difficult.
It is hard to be the observer when you are the participant, so that makes the couples interaction really hard. I have some colleagues, Stanley Tatkin, who is very interested in doing physiological and video-monitoring of couples and then to deconstruct that would be his goal.

The, we might see the physiological state changing in the person. Now, we are so stuck to a cognitive-behavioral worldview that doesn’t totally respect what happens when our physiology goes awry.

If they start to be triggered, and their heart rate starts going up, their blood pressure starts rising, and their body literally wants to jump out of its skin, we tend to tell people, “Just calm down. Sit down. Don’t worry.”

But they are not processing those cues in a rational way – the neuroception is different at that moment.

They are not respectful – and we need to become more respectful of the limitations that our physiological state cause or impose upon our behaviors.

**Dr. Buczynski:** Thank you, Stephen. That’s all the time we have. We appreciate you being with us.
Stephen Porges, PhD is a professor in the Department of Psychiatry and the Director of the Brain-Body Center in the College of Medicine at the University of Illinois in Chicago. He is a neuroscientist with particular interests in understanding the neurobiology of social behavior.

In 1994, he proposed the Polyvagal Theory, a theory that links the evolution of the autonomic nervous system to the emergency of social behavior.

He has served as Chair of the Department of Human Development and was recipient of a National Institute of Mental Health Research Scientists Development Award. He has also authored the book The Polyvagal Theory.

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