Body, Brain, Behavior: How Polyvagal Theory Expands Our Healing Paradigm

A Webinar Session with Ruth Buczynski, PhD and Stephen Porges, PhD

nicabm National Institute for the Clinical Application of Behavioral Medicine

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Body, Brain, Behavior: How Polyvagal Theory Expands Our Healing Paradigm

with Ruth Buczynski, PhD and Stephen Porges, PhD

Dr. Buczynski: Hello everyone and welcome back.

I'm Dr. Ruth Buczynski, the President of the *National Institute for the Clinical Application of Behavioral Medicine*, and a licensed psychologist here in Connecticut – and I'm so excited to share with you, for the first time in the Brain Series, my colleague and friend, Dr. Stephen Porges.

We've had him a few times already in the Trauma Series, and just over the past year or so I started thinking, "This has so many connections; it's really brain science and it's applied in many ways, including trauma, but in other ways, too" – as you'll find out as we go along.

You're probably already familiar with Stephen, but just in case you're not, he's now Professor Emeritus and the former Director of the Brain-Body Center in the Department of Psychiatry at the University of Illinois in Chicago.

He's also the author of *The Polyvagal Theory* – the originator, I am going to say, of the polyvagal theory – this is a profound idea that's expanding how we think about a lot of things, including stress and trauma as well as many other conditions we'll get into on this call.

Today, we'll probably even touch on how this connects to autism, borderline personality disorder and many other ways that this connects.

But it all starts with understanding the vagus nerve and where it is coming from in the brain, and then throughout the bodily system.

So, Stephen, welcome - it's good to see you and have you here again...

Dr. Porges: Thank you, Ruth. It's a pleasure to be back again and I'm really looking forward to the unusual questions that you're going to be asking me.

The Origins of Polyvagal Theory

Dr. Buczynski: All right! Although we have talked about the polyvagal theory before, there are probably lots of practitioners on the call tonight who might not have been with us before or who might just need a quick recap, so can we start there and talk about the polyvagal theory and where it came from.

"Polyvagal theory is based upon the evolution of our autonomic nervous system." **Dr. Porges:** First of all, let's outline what the polyvagal theory is.

PolyvagaI theory is based upon the evolution of our autonomic nervous system, and one thing we have to think about is that there's a big difference between our reptilian ancestors and our mammalian...cousins.

Mammals need to find social relationships, they need to mother, they need to nurse – they need to protect each other.

Reptiles tend to be solitary – so the whole issue of when we talk about social behavior is really the distinction between our reptilian history and our mammalian presence.

With this transition through evolution there was a change in our autonomic nervous system.

Our autonomic nervous system changed from a system that was solely a system that enabled us to mobilize and enabled us to shut down, and could be used for, in a sense, two different types of defenses: one was to run and flee, and one was to basically immobilize, like a reptile. "The whole issue of social behavior is the distinction between our reptilian history and our mammalian presence."

But with mammals, we had a new branch of the autonomic nervous system that basically was in one way the "cheerleader," and in another way the "conductor" of these other two more primitive systems.

"Mammals had a new branch of the autonomic nervous system that was 'cheerleader' and 'conductor' of more primitive systems." It enabled these primitive systems of sympathetic fight/flight and the very old vagal shutting-down system to work together to be synergistic and support health, growth and restoration, but only in safe situations.

Dr. Buczynski: I want to stop you for a second because you said, the "cheerleader" and the "conductor."

Tell me a little bit about what you meant by "cheerleader" and "conductor," and then we'll continue.

Dr. Porges: Actually, this is the first time I used the word "cheerleader"

so I now have to think on my seat!

The "conductor" is the easier one to start with because what we are really doing is creating the context; we're functionally using a higher-brain structure to inform the older-brain structures that they don't have to be defensive – they can work towards health and growth.

It's like we use our higher-brain structures to detect danger – and if there is no danger, then what we're functionally doing is inhibiting older defense systems.

"We're functionally using a higher-brain structure to inform the older-brain structures that they don't have to be defensive."

The "conductor" is basically at the top of the hierarchy regulating and controlling older circuits. This is how the brain is phylogenetically organized.

When we're talking about the autonomic nervous system, it's not merely from the neck, down; it's really the brain stem that is regulating it, and then the cortex is regulating the brain stem.

So we have our "conductor," which is saying, "It's okay. Those systems don't need to be recruited for defense – they can be used to support health, growth and even pleasure."

Now, the "cheerleader" is the concept that we can functionally grab or use some of our defense systems, but not for defense. We can use our fight/flight system and call it "play."

The difference is that we're mobilizing, but we're making eye contact and engaging each other. We're diffusing the cues of threat with social cues so now we can utilize that old system. We can even use the oldest system, which is immobilization, and we can be in the arms of someone that we feel safe with.

Dr. Buczynski: Let's tie that back to polyvagal theory.

Dr. Porges: Yes – that *is* the polyvagal theory.

"Polyvagal theory is not a theory of the nerve; it is a theory of the nervous *system* changing with evolution." **Dr. Buczynski:** Great – thank you, I appreciate that but...

Dr. Porges: Let me decouple it for you. The polyvagal theory uses the name of "vagus" in the title, and polyvagus means "many vagus" or "many vagal pathways" – this is just to remind us that there has been a phylogenetic change, an evolutionary change in the autonomic nervous system.

Polyvagal theory is not a theory of the nerve; it is a theory of the nervous *system* changing with evolution.

The "Vegetative Vagus" and the "Smart Vagus"

Dr. Buczynski: That's interesting – in your book you talk about "two vagal motor systems" – the "vegetative vagus" associated with a more passive regulation of visceral functions, and then the "smart vagus." Let's just talk about those two a little bit.

Dr. Porges: ...there's a paradox that resides in studying the parasympathetic nervous system. The parasympathetic nervous system, when you read the literature, is

always associated with health, growth and restoration – it is the "good guy."

The sympathetic is always presented as if it is the "mortal enemy" that we need to control. That is partially true, but it really doesn't *help* us.

What happens if you're immobilized with fear and your heart stops through a vagal pathway, or you're immobilized with fear

and you defecate through a vagal pathway, or you can't breathe because your bronchi constrict through a vagal pathway – we can't explain that as being "good."

So there was a real paradox in understanding how the parasympathetic nervous system worked, and that paradox was that people basically expunged all the information regarding the parasympathetic nervous system as a defense system.

Again, if we look at reptiles, that's their primary defense system: immobilization, inhibition of breathing, slowing up the heart rate – "death-feigning" – basically looking like they are dead.

In fact, when we look at a mouse in the jaws of a cat, what are the mouse's features? The mouse's features are: not breathing, heart rate going very slow – looking as if it were dead.

"The parasympathetic nervous system is always associated with health, growth and restoration."

"We're diffusing the cues of threat with social cues." ...This is all involuntary, so to look at the parasympathetic nervous system, through the vagus, as being solely positive, is just not the true story.

This paradox is really what triggered my interest – and it's over twenty years now – to try to decouple this problem.

The problem or the whole issue was decoupled by an understanding that, through phylogeny, through our evolutionary history, and also through development, we can see the two vagi, the two vagal pathways, coming on board.

When preterm babies are born, they're born without this new, smart or mammalian vagus, and what happens is vagal responses are deadly – and we call those, in the intensive care unit, apneas and bradycardia – when they stop breathing and the heart rate gets too slow.

But if that's vagal, that should be "good," but it's not for the preterm because they don't have this newer, myelinated vagus, which comes in later in gestation; it comes in phylogenetically *only* in mammals, and

enables this new myelinated vagus to be the conductor/coordinator of those other vagal circuits and the sympathetics.

Dr. Buczynski: That is the "smart vagus."

Dr. Porges: That is the "smart vagus," and we can use interchangeable words: mammalian, smart, and myelinated.

Then we have what we call a vegetative and unmyelinated vagus. We can do another distinction: we can say sub-diaphragmatic – underneath the diaphragm and this goes to the visceral organs versus the supra-diaphragmatic vagus.

"The supradiaphragmatic vagus is myelinated and goes to primarily the heart and bronchi; the sub-diaphragmatic is the unmyelinated one going to your gut." The supra-diaphragmatic vagus is myelinated and goes to organs above the diaphragm, primarily the heart and bronchi; the subdiaphragmatic is the unmyelinated one going to your gut.

Dr. Buczynski: Now, I am trying to take some notes here – and I got the "mammalian/smart/myelinated/supra-diaphragmatic" and that contrasts to… Can we just go through the others again?

Dr. Porges: Sure. The sub-diaphragmatic would be the unmyelinated vagus. It is shared with reptiles, it is shared with fish, it is shared with amphibia – and it goes sub-diaphragmatically, regulating our gut primarily. When we talk about clinical disorders, we talk about things "getting to our gut."

When we go *above* the diaphragm, we're really talking about the heart and the bronchi – and above the diaphragm, that's primarily the myelinated vagus. When that loses control, then we get this heart drop.

The cues of our body tell us a *lot* about this system. But let's move (this idea) to the brain, because each of those vagal pathways actually comes from different parts of the brain – and this is why the polyvagal theory becomes more than a theory of a peripheral nerve.

"Through our evolutionary history, we can see the two vagal pathways coming on board." The vagus is a peripheral nerve because it leaves the brain, but in the brain, vagal pathways defining the two vagi come from different nuclei in the brain stem.

Here is where I view it as being really interesting and important: the smart, myelinated mammalian vagus comes from an area that is integrated with the control of the muscles in the face and head.

When we look at people – many of the people on the call or watching this video are clinicians, and they always look at people, or at least they *should* look at people – and when they do, they often can tell how a person is feeling.

Part of why we can tell how a person is feeling is because the nerves that control all the striated muscles of the face and head are linked in the brain stem to the myelinated smart vagus – we're wearing our heart on our face.

But, again, insightful clinicians and insightful people know that. It's not just the muscles of the face that are showing it, but the muscles that control vocalization.

"All the striated muscles of the face and head are linked in the brain stem to the myelinated smart vagus - we're wearing our heart on our face."

"The neuroregulation of the larynx and pharynx that creates prosody are shared in the brain stem with the neuroregulation of the smart myelinated vagus." So when we talk to a person on a phone, we can say to them, "Oh, what's the matter?" because the voice is not modulating - it doesn't have the prosodic, the intonation features.

The neuroregulation of the larynx and pharynx that creates prosody are shared in the brain stem with the neuroregulation of the smart myelinated vagus.

Dr. Buczynski: Now, you have used a word that I want to get you to define..."prosody" – what are we talking about when you use that term?

Dr. Porges: A prosodic voice has intonation – this is in contrast to a monotone.

I'm going to give you an example. I'm going to talk like a traditional college professor and people are going to start tuning out, or I'm going to talk like an angry father trying to discipline his son – the voice gets louder and it's modulating in volume.

So prosody is the modulation of pitch. Think of a mother's lullaby as she calms a child. That is prosodic vocalization.

Interestingly, all mammals use this to communicate social cues to their offspring and to their conspecifics – meaning animals of their own species.

"Prosody, the modulation of pitch, is used by mammals to communicate social cues."

We have to think a little differently about language and

vocalizations. We live in a very cognitive-centric world – even the title, when we're talking about the "Brain Series", we think that our experiences reside very, very high up.

We forget that language is not merely syntactical; it is not merely the conveyance of the words – it is how the words are being presented.

As clinicians and as social human beings, we're much more interested in the intonation of the voice than we are in the content.

From Vagus Nerve to a Family of Neural Pathways

Dr. Buczynski: Let's get to a couple more foundational questions before we move on.

Biologically, the vagus nerve is -I want to get into where that is located. I know that it is not just one nerve but a family of neural pathways originating in several areas of the brain stem and going into several branches of the vagus, but let's go through that just a little bit.

Dr. Porges: The vagus is a cranial nerve. That means it's leaving the brain; it is coming out from the brain.

We have a number of cranial nerves, and some of the cranial nerves control the striated muscles of the face.

When we think about most of the nerves that people talk about, they happen to be skeletal motor – they come down the spine, they come off, and they regulate limbs and trunk.

But there are other nerves that regulate motor activity. These are cranial nerves coming directly from the brain stem. The neural regulation of facial muscles is regulated

by cranial nerves; facial expressivity isn't shared with the neuroregulation of the hands or the limbs. It's a different system.

We also have nerves that control muscles that are not striated, but smooth and cardiac muscle.

The vagus is a motor nerve controlling smooth and cardiac muscle, and it comes from the brain stem.

The brain stem is functionally at the apex of that inverted triangle that we call the brain. When we talk about the cortex (and this is in everyone's interest) the brain stem tends to be neglected.

But the brain stem is the pathway where virtually everything comes in and out. It's a building block; it's foundational; it's the area upon which other processes are scaffolded.

"The vagus is a motor nerve controlling smooth and cardiac muscle, and it comes from the brain stem." If we can't regulate our physiological state, which is a brain stem responsibility, then we can't access and process some of these higher cognitive functions.

As a clinician, one of the major issues really is physiological and behavioral state control. Whether you're talking about borderline, or autism, or any other clinical disorder, one of the primary issues is whether the individual is capable of regulating his/her own state? And, is the regulation of state challenged when context or demands change?

"As clinicians and as social human beings, we're much more interested in the intonation of the voice than we are in the content." So, back to your point: the vagus emerges from the brain stem, but the real issue is not to think of the vagus as this nerve floating in this visceral sea, but to think of what the vagus really is – the vagus is a conduit. The vagus is a pipe that has lots of neural fibers running through it.

Some of those fibers come from one area of the brain, and some come from a different area of the brain – and those fibers have different responsibilities. Some go down, but many more come up.

About eighty percent of the vagal fibers are sensory, and those sensory ones have tremendous impact on the accessibility of certain brain structures.

What the polyvagal theory emphasizes is that the vagus changed with evolution, and it changed from just regulating visceral organs to being integrated with the regulation of the face.

Here's one final point on that - it did that for certain adaptive functions. As a mammal, we don't want to engage another mammal if that mammal is in a physiological state of rage.

"If we can't regulate our physiological state, which is a brain stem responsibility, then we can't access and process higher cognitive functions."

When they're in this physiological state and we encroach - get close to them - they'll be defensive and they will bite us, or they will hurt us. We want to know that it's okay to come close.

Mammals convey this information through facial expression and through prosodic features of vocalization – the muscles regulating those functions are linked to the myelinated vagus.

"The vagus changed with evolution, from just regulating organs to being integrated with the regulation of the face." This goes back to when we were discussing the different pathways of the vagus, and here's another way of conceptualizing this: one deals more with above the diaphragm and one deals with below the diaphragm – but the one that deals with above the diaphragm is linked to the neural control of facial muscles.

What this tells us or enables us to know is that when the neuromuscular control of the face isn't working – this is often labeled as "flat affect," which is a common feature of many individuals with clinical conditions – and when the face isn't working the regulation of the middle-ear muscles is also compromised, which makes people hypersensitive to sounds and have difficulties developing language

skills especially when they're young – this is all linked to the myelinated vagus.

What we find in clusters of clinical populations...is that the myelinated vagus just isn't really working that well, and we also see manifestations on the face.

Rather than using a *DSM* 4 or a *DSM* 5 categorization, we ask the question, "Across clinical disorders, what are some of the common features?"

"Mammals convey information through facial expression and through prosodic features of vocalization - the muscles regulating those functions are linked to the myelinated vagus." What we would find out is that state regulation is really one of the problems – the ability to regulate behavioral state.

We'd also find that, coupled with behavioral-state regulation, would be certain other features related to the neuromuscular control of the face.

The upper part of the face would be kind of flat – like the Botox world – it would not be responsive.

Linked to this is the orbicularis oculi – the orbital muscle around the eye – is the neuroregulation of middle-ear muscles. If this muscle (is not working) a person will have auditory hypersensitivities and will have difficulties extracting voice from background sound.

The issue on this is that the neuroregulation of the orbicularis oculi, the upper part of the face, is also linked to the neuroregulation of the middle-ear muscles.

The middle-ear muscles control the smallest bones in our body,

which determine the acoustic transfer function defining the sounds that are transmitted through the inner ear to our brain. The middle ear muscles influence what happens to the energy of sounds that hit our eardrum and get transmitted into the inner ear and then to our brain.

If the middle-ear muscles aren't working, or are being bombarded with low-frequency rumble from background sound, then we can't hear human voice, and we have difficulty – so we now use behavior to move us out of those social settings.

The part that I really want to communicate is that the cues that we are giving with our face are really manifestations of our physiology, what's going on in our body.

"The neuroregulation of the orbicularis oculi, the upper part of the face, is also linked to the neuroregulation of the middle-ear muscles." The important part is that we're cueing the other individual – are we safe to come close to? This history travels with us from the most primitive mammals; mammals have always had to do this.

I'll give you a little aside experiment. My wife is Sue Carter, and Sue is the one who discovered the importance of oxytocin in social bonding.

We decided to implant telemetry devices in the vole so that we could measure their heart rate, but we also wanted to measure their vocalizations.

What we found is that their vocalizations were a reflection of the vagal regulation of their heart – they were basically communicating to each other whether they could be safe to come close to.

We implanted the vole, which is a very small mammal that is about fifty grams, with little heart-rate telemetry devices, and we measured what we call "ultrasound" vocalizations. These are not ultrasonic to the vole; they're audible to them. "The cues that we are giving with our face are really manifestations of our physiology."

"What we find in clusters of clinical populations...is that the myelinated vagus isn't really working that well." "People use prosody to communicate to the *biology* of the individual whether they're safe to come close to." These vocalizations were cueing the other voles near them whether they are safe – whether they can mate, or whether they can come close.

But people do the same thing – that's really what I'm trying to say – people use prosody to communicate to the *biology* of the individual – not to the cognitions, but to their *biology* – whether they're safe to come close to.

Let's look at this in terms of social relationships or when we meet people...we might say, "He's a nice person, he's got good credentials,

and he's a bright guy, but, you know, I just don't like him." What are the features that make an individual not really like another?

I'm trying to really articulate: it's the features cueing the individual that this (new person) is not *physically* safe to be with.

One of the important evolutionary packages that we come with is that our nervous system is primed to listen for prosody as a cue to down-regulate our defensiveness. That process of down-regulating defense is coming through this new myelinated vagus.

Dr. Buczynski: Thank you. That is very interesting and very, very helpful.

The Vagus and Cardiopulmonary Function

Now, you have a lot of thoughts on cardiopulmonary function and the vagus. Can we tie that all together?

Dr. Porges: The simplest take-home on that is oxygen is important to mammals, and oxygen is important to humans.

The important part is: how do we get oxygen into our blood? This is one of the important interplays or roles of this vagal and cardiovascular system.

The vagus facilitates the diffusion of oxygen into the blood by forcing blood across the bronchi to increase the oxygenation.

When we start seeing clusters of disorders – we see hypertension, we see obstructive and non-obstructive apnea, we see diabetes; we see a lot of conditions occurring – there's comorbidity (two or more coexisting medical conditions) usually with all those, and it means that this myelinated vagus is really not working. "Our nervous system is primed to listen for prosody as a cue to down-regulate our defensiveness."

But from the clinical perspective, you start finding that there are *always* clinical correlates – and when I say "clinical" I mean psychiatric or psychological – correlates to many of these disorders because the system that regulates the myelinated vagus – or let me say the myelinated vagus in a human's nervous system that is involved in regulating physiology – is also greatly impacted by the social cues of the environment.

The take-home point is that the neural circuit of social interaction and social engagement is the same neural circuit that supports health, growth and restoration.

It's not two disorders, or two diseases, or two disciplines. It's not an internal medicine on one side and

"How we get oxygen into our blood is one of the important interplays of this vagal and cardiovascular system." a psychology and psychiatry on another side – it's an integrated physiology that is not only regulating health, growth and restoration, but it's an integrated physiology that fosters and supports social interaction to create safety for the individual.

This is a word we haven't used in this interview yet – but *safety* is the critical feature here. If our nervous system detects safety, then it's no longer defensive. When it's no longer defensive, then those circuits support health, growth and restoration.

It's a hierarchy, and the most important thing to our nervous system is that we are *safe*.

When we're safe, magical things occur. They occur on multiple levels – not merely in terms of social relations, but also in accessibility of certain areas of the brain, certain areas of feeling pleasure – being expansive, being creative, and being very positive as well.

Dr. Buczynski: What would that mean for *your* definition of stress?

Dr. Porges: "Stress" is one of those strange words that's become part of our vocabulary, and it's become such a confusing word that we now talk about "good stress" and "bad stress."

I don't even like to use the word! To me, when we use the word "stress," what we're really talking about is mobilization – and mobilization isn't bad.

Mobilization is part of being a mammal, part of being a human.

So the issue is when mobilization doesn't have a functional outcome, then maybe that could be called "maladaptive mobilization" and maybe that's what "stress" is.

Here's an example: if you don't like giving interviews or being interviewed and your physiology shifts and your heart rate accelerates and you want to get out of the situation, not being *able* to get out would be maladaptive.

Your physiology would support mobilization but you can't mobilize – and that would be maladaptive.

The Sixth Sense and Interoception

Dr. Buczynski: You have a concept about the sixth sense and interoception.

Dr. Porges: Yes. Part of what has been neglected in modern society and in terms of dealing with the management of being a human being is a rejection of bodily feelings and a respect for the feedback our body is telling us.

"The most important thing to our nervous system is that

we are safe."

"The neural circuit of social interaction and social engagement is the same neural circuit that supports health, growth and resotration." If we think about developmental process within the socialized environment, we're always talking about, "Don't respond to your bodily needs: sit still longer, don't go to the bathroom now, or don't get hungry." We're turning off these afferent feedback loops.

Interoception is a respect for the feedback from our viscera to our brain. When we understand interoception, we'll understand that we can use that, again, to access different areas of the brain and be more efficient.

Dr. Buczynski: Does that relate to higher-level processes?

Dr. Porges: Yes, in a way...if you have severe gastric pain, can you function well on high-level cognitive tasks?

The feedback from our viscera is limiting our ability to respond. Our culture really doesn't have a place for that so it tries to deal with that in part by saying, "If you feel that pain, take medication so you don't feel the pain."

But what if your body is trying to cue you – to tell you something, to help you, or to inform you of the situation?

Interoception is a very interesting concept. I am going to give you an example: interoception in my world blends into this other construct that I like to use, which I call neuroception – and that's the nervous system's evaluation of risk in the environment.

"With interoception and neuroception there is no cognition."

With interoception and neuroception there is no cognition. It's occurring and then we try to make a narrative to explain why it happens.

The neuroception was this: you meet someone; the person appears

to be bright, attractive but you don't really like the person because of the way the person is articulating – the lack of prosody and the lack of facial expressivity.

You don't understand why, but neuroceptively your body has just responded, "This is a predator or a person who is not safe," so you develop a personal narrative to make it fit.

How Vagal Tone Relates to Emotion

Dr. Buczynski: I'd like to get into emotional regulation. How is vagal tone related to the expression and regulation of emotion?

Dr. Porges: "Emotion" is a complicated word as well because it deals with a variety of expressions and feelings that are being regulated by different systems.

First, emotions are complicated, as we always like to say, but emotions are a cluster of psychological constructs that have been put together. All emotions are not really representing the same types of physiological pathways.

"Emotions are a cluster of psychological constructs that have been put together."

"What has been neglected in modern society is a respect for the feedback our body is telling us."" Talking, which is an important part of emotion, is highly linked to this new mammalian myelinated vagus because facial expressivity is regulated through the striated muscles of the face and head, and that shares, in the brain stem, the same area that regulates the vagus.

If you lose that vagal control of the myelinated vagus, then the type of emotions you can express changes – you become flatter in the face, especially the upper part of the face, while the lower part of the face may actually become exaggerated. That is because the lower part of the face is still part of an old defense system – it is the fight/flight.

"Vagal activity and emotions are linked, but there's a second dimension to emotion." Vagal activity and emotions are linked, but there's a second dimension to emotion.

The first dimension I was talking about is this common linkage between the regulation of the striated muscles in the face and head, the intonation of voice and the vagal control.

But the second one is really this interplay between emotion and physiological state. If people are in states of mobilization, the range of emotion that they can express is greatly reduced because if they have to

mobilize, they have to down-regulate the myelinated vagus.

Here is your example: visualize a couple, two people, interacting on treadmills where they're running and moving very, very rapidly.

They'll state that they're mobilizing – running – and you'll see what range of emotional expressivity they could have when they're in that physiological state.

Of course, intuitively, you know that the range would be greatly limited because their physiology would not support the regulation of facial expressions.

If you want to create arguments with spouses or friends, you use a "flat face" – don't respond to anything they say; just keep a "flat face" or turn away, and their body will react to it.

Dr. Buczynski: If vagal regulation is a key part of emotional regulation, then interference with the process would lead to affective disorders.

Dr. Porges: Or misinterpretations of intentions.

We could block the expression. Let's say we use Botox, and Botox, especially, would take away the orbicularis oculi, the overall muscle, and could block expression.

We look at people's upper part of the face for the cues of affect. If we block that, then we misinterpret it.

If we block their vagal control of the heart, since that area is also regulating the area of the face, then we're going to create problems.

Now we have the issue that if you're taking medications – and medications have built into them certain anticholinergic influences, meaning they would block cholinergic pathways – of which the vagus is a major peripheral cholinergic pathway – then medications may change the range of emotional expression.

"Medications may change the range of emotional expression."

Three Stages of Neural Control of the Heart

Dr. Buczynski: Yes. According to the polyvagal theory, there are three stages of neural control of the heart, and each one serves a different function. Let's get into that a little bit.

Dr. Porges: With functions, we have to think in terms of adaptive function. If we go from the most primitive, which is the unmyelinated vagus, we still have some pathways from that older system that reptiles use – and that actually has the profound effect of reducing metabolic demand.

If we were expert yoga masters or the people who claim that they can in a sense go into a confined space and not breathe very much, that would be a system they would be recruiting – this old vagal system. **"If you're going**

The old vagal system, when it can be used to reduce metabolic demands, has an adaptive function. But remember, if you're going to reduce cardiac output, you have to reduce motor activity, because if you don't, you'll have a tremendous oxygen debt.

So the old vagal circuit has an adaptive function.

Unfortunately, for mammals, that adaptive function can often be lethal – and that was the issue of the mouse death-feigning in the jaws of a cat, where the heart rate gets very slow, the mouse stops breathing and looks like it's dead – and some of them actually die from going into that state.

Mammals can functionally die from this type of immobilization.

"The sympathetic nervous system is the mobilization circuit."

The second part of the polyvagal trilogy or hierarchy is the sympathetic nervous system – it is the mobilization circuit.

We can think of the old vagus, the unmyelinated vagus, as being the immobilization circuit, and we can think of the sympathetics as being part of a mobilization circuit.

The new vagus is really part of this social engagement circuit.

Now, when you couple that social engagement circuit with mobilization - you use face, you use voice,

and you mobilize, but when you couple immobilization with the social engagement, then we call it falling in the arms of someone that we are safe with.

We can embrace the baby or the loved one so that immobilization now is no longer a defense strategy but a strategy in which we reduce metabolic demands.

In our minds we always say, "If you're ill...it's better that you don't move around too much." But we're not saying, "We will make that person not move around" by putting restraints on them; we're saying they should not move around – they should trust us, feel safe and let their body do the healing as opposed to their body being defensive.

"There's a whole interplay between socialization and physiological circuits, and each one can do its job if we're in safe environments."

to reduce

activity."

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you have to

reduce motor

There's a whole interplay between a socialization process and these three physiological circuits, and each one can do its job, if and only if, we're in safe environments.

The Vagal Brake

Dr. Buczynski: Let's talk about the "vagal brake" – what is it and what does it do?

Dr. Porges: The "vagal brake" is the reason you can sit there and I can sit here without feeling like we're jumping out of our skin!

The "vagal brake" in mammals is that myelinated vagus; it's a pathway going from the brain stem to the sinoatrial node, and it inhibits our heart rate.

What we often forget is that without the vagus, our heart would be beating twenty/thirty/forty beats

per minute faster. We'd basically have a heart rate over a hundred beats per minute, but the sinoatrial node acts as the heart's natural pacemaker.

The vagus is a "brake" inhibiting that so our heart rate is slower – and this provides tremendous interesting options.

It means that if we want to get our heart rate up ten beats per minute/ twenty beats per minute, we just pull the "brake" off; we don't need to stimulate the sympathetics. If we stimulate the sympathetics, it's a sloppier system – more diffuse – and we may literally get into a state of rage or mobilization. "A mammal has this wonderful ability to increase cardiac output to improve mobilization without triggering the sympathetic nervous sytem."

A mammal has this wonderful ability to increase cardiac output to improve mobilization without triggering the sympathetic nervous system. Just by pulling the "brake" off, we can make these minor adjustments.

Polyvagal Theory and Autism

Dr. Buczynski: Let's get into autism a bit and think about how all this plays out with people who are on the autism spectrum.

Dr. Porges: Yes...whenever we choose a term that's a psychological construct, when we move it into physiology, we create a real problem.

The phenotypical definition of a disorder doesn't always map directly into a one-to-one neurobiological or even a biobehavioral model.

In looking at autism, we pick out a few things that really are common threads. One is the social engagement system...

The primary features, or many of the features that autistic individuals have, are around state-regulation issues.

If you talk to the parents or go to schools with autism or work with autistic kids, probably the priority

within any of those socialized settings is whether or not the child's behavior can be regulated because they're literally going into a rage or bouncing around the walls.

With autism, there are often oppositional or aggressive behaviors manifested because the body is not in a state of control - it is defensive.

Even if you watch the hands of autistic children, they are often like this –they're protective. The body is protective. "With autism, there are often oppositional or aggressive behaviors manifested because the body is not in a state of control - it is defensive."

The treatment of autism would often be more efficient if we put the cognitive development and the social development aside for a moment and said, "Can we work on understanding the cues that could be used to

"The treatment of autism would be more efficient if we said, 'What are the cues that trigger defensiveness?"" enable the autistic individual to enhance behavioral-state regulation, or what are the cues that trigger defensiveness?"

We want always, with autistic individuals as with others, for them to use their cortex to inhibit brain stem mechanisms to foster states of calmness. But that is the deficit – that cortex doesn't have efficient access to that pathway.

Autism, on the first level, is going to have fight/flight mobilization behaviors – that is very clear.

The second part of that is a complex integrated social engagement system, which has the vagus coming down to calm us, but is also linked to the neuroregulatory control of the facial muscles – and of course the upper part of the face of autistic individuals is often flat.

Autistic individuals often – more than sixty percent – have auditory hypersensitivity...and often their ear muscles aren't working. If you looked at their face and the facial muscles, the facial muscles aren't working, especially the orbicularis oculi – which means the middle-ear muscles aren't working efficiently resulting in auditory hypersensitivities.

"Autistic individuals often have auditory hypersensitivity."

If you have auditory hypersensitivities, then being in crowded and noisy places is painful – a low-frequency rumble is dominating the acoustic experience and they can't understand the words that are spoken to them – and what is another feature of autism? Language delay.

"Many who carry the diagnosis of autism detect cues of danger and not cues of safety." At the root of many individuals who carry the diagnosis of autism is this defective, or let's say depressed, social engagement system; the body is detecting cues of danger and not cues of safety in social engagement.

Dr. Buczynski: In thinking of a framework, where would we go? Where would *you* suggest the field should go in treating people who are on the autism spectrum?

Dr. Porges: That's a tough question, so let me first start by saying there is no answer – but let's speculate with what we could do.

First, we should be respectful of the uniquenesses in sensitivity that autistic individuals have – and the primary one, of course, will be acoustic or auditory.

We can't say, "If I can function in this room and the background rumble doesn't bother me, it shouldn't

bother the autistic individual." We just can't do that; we have to see the world from the sensory perspective of the autistic individual.

If we know what sensory information is getting into their nervous system, we need now to do one of two things: create the environment which takes care of removing that, and/or try to develop an intervention strategy that exercises the systems that will enable them to filter out the low-frequency sounds.

"We have to see the world from the sensory perspective of the autistic individual."

In the past, as a discipline, we have treated the autistic individual as if

they were a normal person with the *volition* of not wanting to listen, the *volition* of not wanting to control the behavior – so we have used reinforcement models, which have been highly effective for certain types of behaviors, but relatively ineffective in creating natural social behaviors.

We can say, "We'll condition you; we'll train you to make eye contact." But we do very poorly in creating the spontaneity of the upper face and enabling the person to express a cue that is reflecting their physiological state.

When the face of the autistic kid is saying, "Hi, how are you?" and the face is just frozen and the jaw is down here, they're manifesting their visceral state of this desire to mobilize and get the hell out of there.

So to the first point: can you create a safer, quieter environment? That may mean that we have to redesign the concept of a classroom.

Classrooms are always designed with the notion that people sit behind each other – but if you sit behind someone, and you're not in a state of safety, you're concerned about what is going on behind you. You can't get out of a physiological state that supports mobilization.

Maybe the classroom for autistic kids needs to be a semicircle. When we see autistic children sitting on the floor against the wall in corners, the children are telling you what *they* need – to feel safe.

Dr. Buczynski: The other part of your theory that you shared was about going in a direction of helping them learn to modulate some of their behavior.

Dr. Porges: Yes...I started this over a decade ago to try to develop a technology to exercise the middleear muscles.

"What would happen if we could exercise the neuroregulation of those middle-ear muscles?"

It was really based upon the notion that if the upper part of the face isn't working, then the middle-ear muscles are not working and therefore low-frequency sounds are coming in.

Now, what would happen if we could exercise the neuroregulation of those middle-ear muscles? What would happen to social behavior and what would happen to vagal

regulation of the heart, since in the brain stem, these are all circuits that are integrated?

We developed what I called the *Listening Project*, which was functionally a neural exercise of acoustic stimuli.

It was pretty successful in that about sixty to seventy percent of children with auditory hypersensitivities can go through this type of training and no longer have auditory hypersensitivities.

The problem of course is how do you bring it up to scale and how do you introduce it to the clinical community, especially when there are other types of interventions out there.

So, we basically put it on hold – we did the research, because there was one thing missing: we needed to measure the middle-ear muscles, and there was no device to measure that dynamic activity.

There were devices called tympanometry that measured acoustic reflexes of the middle-ear muscles, but

"We now have a patent to measure the transfer function of the middle-ear muscles." nothing measured the transfer function of what got in.

It took me about fifteen years and about five grad students. Finally, I had one grad student, Greg Lewis, who was really super and we worked on this together. I am sure you will be hearing more about Greg in the future.

We now have a patent – it was just published last June – to measure the transfer function of the middle-ear muscles.

We have a device that can do the assessment to show the deficit in many of the autistic individuals, and we can show that the transfer function changes with our intervention.

I'm working with a group in Australia to do a feasibility study with children there, and if that works, we're probably going to be able to test the intervention in several sites in Australia.

In Australia, they weren't interested in autism – they were interested in abused children. But many of the children who are abused and neglected are also on the autism spectrum.

The features overlap – difficulties with social-engagement behaviors, state regulation, language development, and auditory hypersensitivities – it's the world that this model will work well with.

Polyvagal Theory and Borderline Personality Disorder

Dr. Buczynski: You've also hypothesized that patients with another construct – borderline personality disorder – might have difficulty maintaining the "vagal brake."

Dr. Porges: Yes, and this goes back to this whole notion of neuroception and what our body detects in evaluating risk in the environment.

functionally a

neural exercise of

acoustic stimuli."

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"Many abused and neglected children are on the autism spectrum." Where most people see another person in their presence as making them feel safer, if someone else comes into that context, their nervous system goes into another state and says, "I have to get out of here. I don't

"Borderline individuals may have a neuroception strategy that's very conservative." trust the person. I'm not safe."

Borderline individuals may have a neuroception strategy that's very conservative – and let me give you the metaphor for that.

When we travel by air, we go through security devices at the airport and are interrogated by the TSA agents. Functionally, a borderline person's nervous system is operating as if they have their own personal TSA agent.

Their nervous system is evaluating each personal contact and making a decision that is functionally saying, "Come on board – or don't come on board."

If we want to be a hundred percent sure that there will be no terrorist on the plane, the TSA agent would basically flag everyone. Nobody would get on the plane, and there would be no terrorism or terrorist attack on an airplane – but no one would fly, either. The risk is so great to certain individuals that they would not allow anyone on.

Now, let's speculate that the borderline personality's neuroception is set at a threshold that is extraordinarily low and says, "If anyone has *any* feature, they're not coming on board; I'm going to react to them and I'm going to get away from them."

The issue is really the cues in the environment – the cues of the individual to the borderline – basically triggers defensiveness, when in most other people it wouldn't.

Dr. Buczynski: Where would that lead us, if we follow up that idea?

Dr. Porges: This is what it would lead us to...first, let's assume we go no further than understanding these features of neuroception– we don't develop any intervention other than having an understanding.

If we understood this and informed patients and therapists of these features, that in itself can change how the person reacts. Once they

understand what they're doing, there is a certain changing – a more top-down regulation.

Let me shift the metaphor for a moment and talk more about trauma, and then we'll get back to borderline.

I frequently give talks to groups of therapists who deal with traumatized individuals. I started to convey a theme, and the theme was we have to understand that our body, in going into certain types of responses when we're traumatized, is acting in a very heroic way. The body is helping us, it is saving us, and our body is not failing us – it's doing something special.

The problem is that when it does what is *special*, like shutting down, we didn't evolve to easily get over that event. Generally, you do - it's not a voluntary thing, but once we do it, it is a reflex - our body has changed.

"If we informed patients and therapists of these features, that can change how the person reacts." "I wanted the therapists to talk to their clients about all the *wonderful* things that their body did to enable them to be safe." I wanted the therapists to talk to their clients about all the *wonderful* things that their body did to enable them to be safe.

They had to understand that being safe was the important thing - they survived these horrible events - and now they needed to treat themselves as if they were heroines and heroes.

They went back to their practices and they started to talk to their clients, and the feedback that I was getting through the

Internet – lots of emails where people were writing directly to me and saying, "When I could understand this, when my own personal narrative was no longer about blaming my body for not being able to be social, but feeling good about what my body did for me, suddenly things became better."

A lot of the therapy, from a behavioral perspective, is to expose – and to expose in the body is very defensive – but when we understand that our body has done wonderful things for us and we are proud of it and not embarrassed, then there's a transformation that's occurring.

What I'm also saying is that perhaps something similar could occur with borderline if we saw borderline as a low threshold to respond defensively to humans.

Of course, if you look at the clinical history of borderline – we see the very unpleasant histories that they

bring with them - it's perhaps this overlap between trauma and borderline and other experiences that their nervous system really got into a state where it was functionally more adaptive to them to act like that TSA agent that says, "No one gets on this plane," and they survived it.

Now they can see this in its adaptive function. They can be *proud* of surviving, and they can see the limitations without being angry and disappointed in themselves.

Dr. Buczynski: That reminds me a little bit of the compassion research going on and people studying compassion, self-compassion, and finding that that has a huge impact on behavior change and on depression and anxiety...

"They can be *proud* of surviving without being angry and disappointed in themselves."

I'm thinking that your explanation will have a great way of increasing self-compassion, which maybe puts the brain in a totally other state.

Dr. Porges: Yes – and what we're really talking about is putting the brain in a state of safety.

Actually, we can flip this a little bit because when people talk about compassion, they're also often talking about mindfulness.

They're often talking about evaluation – and we can think about the three levels of the autonomic nervous system that I described within the same model.

As long as we're in the state of non-evaluation, then we don't request our defense systems.

"What we're really talking about is putting the brain in a state of safety."

What we're really talking about is when people are defensive – feeling bad about themselves, feeling angry at someone else – they are recruiting older neural structures....

The metaphor here is that evaluation is defensive – and whenever we are evaluative, especially self-evaluative, we are already recruiting the biology of defense

Dr. Buczynski: Yes – it becomes clear when you put it that way. We don't have any more time left, and I just want to say thank you for being here.

Thank you for all that you have done; maybe it's me just absorbing your ideas better and better – but I think your ideas just keep growing and expanding into more and more implications...

I look forward to many *more* times when we can meet with you to deepen our understanding of this because, although we have met several times, I think we still are scratching the surface of what you have discovered.

So for now, let me just say thank you – thanks for sharing your ideas.

There are thousands of people on the call tonight and they come from all over the world, and I want your ideas to get out to everyone, wherever you are.

Thanks very much for being a part of this Brain Series.

Dr. Porges: Thank you very much for inviting me, Ruth. Thank you, and good night.

Dr. Buczynski: Good night.

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"Whenever we are evaluative, especially self-evaluative, we are already recruiting the biology of defense."

Talkback Segment with Joan Borysenko, PhD and Ron Siegel, PsyD

Dr. Buczynski: We're about to go into our TalkBack Segment, but before we jump right in, let me introduce – and I know they don't really need introductions because you've watched and participated with us in other calls with each of them – but this is Dr. Joan Borysenko.

She's a clinical psychologist as well as a Harvard-trained cell biologist and author of many, many books. She's the pioneer of mind-body medicine – she started probably the first mind-body medicine clinic at the Deaconess Hospital in Boston.

And this is Dr. Ron Siegel. He's also a clinical psychologist – and Harvard comes up yet again. He's an Assistant Clinical Professor of Psychology at Harvard Medical School, and also the author of many, many books including *The Mindfulness Solution*.

So, welcome again - and let's start, as we often do every time - what struck you about this webinar?

"Psychotherapists focus on learned behaviors and predispositions. But we don't focus that much on the more basic elements of the nervous system, like the vagus nerve." **Dr. Siegel:** As I went through it, listening, it occurred to me how much of the time we psychotherapists focus on the narrative. We focus on thinking about learned behaviors; we focus on, of course, certain kinds of predispositions toward different kinds of thoughts and feelings – predispositions to different psychopathologies.

But we don't focus that much on the rest of the nervous system. We don't think that much about the more basic elements of the nervous system, like the vagus nerve that Dr. Porges talks about in such detail.

The vagus raises so many interesting ways to understand everyday experience. I was particularly struck by the aspect of vagal nerve functioning that involves shutting things down.

When we *do* think about aspects of the nervous system other than just the brain, we often think about the fight or flight response, adrenalin, the sympathetic nervous system, and arousal patterns, but we *don't* spend so much time thinking about the mechanisms that are there from our "lizard brain" that help us to dampen everything down when we're in deep trouble.

It's very interesting to think about and observe how that plays out, both in my own consciousness and in the consciousness of my patients or clients.

Dr. Borysenko: The theories of Stephen Porges are *extremely* interesting. My background is in what we used to call "psychosomatic medicine" – and now, of course, we call it mind-body medicine – but one of the earliest fields of research was about parasympathetic nervous system activity and cancer.

There were some very interesting articles (I'm going all the way back into the sixties – fifty years) that looked at the incidence of lung cancer in people with certain personality traits.

"One of the earliest fields of research was about parasympathetic nervous system activity and cancer." They were easygoing, and they were hard to arouse; they were kind of immobile in many of the ways that they coped, and it turned out that they had a great deal of parasympathetic tone.

While it wasn't understood what the relationship was, there was a fairly robust statistical correlation between the enhancement of parasympathetic nervous system activity and the incidence of lung cancer in an otherwise matched population. That was always confounding.

So when Stephen talked about that paradox - that we tend to think of the parasympathetic nervous system as

"What we're looking for in all of our physiological and psychological systems, is flexibility. The therapists needs to be a source of safety and narrative repair." the "good guy" and the sympathetic nervous system and its fight or flight responsivity as the "bad guy" – once again it reminded me that what we're looking for really, in all of our physiological and psychological systems, is flexibility – the ability to have different modes of response that are suitable to what is going on in the environment.

The most important idea from all of this is that the therapist needs to be a source of safety and a source of narrative repair, and that, in and of itself, helps restore flexibility to the two parts of the vagus that he talks about so clearly.

I thought it was really a very exciting presentation, Ruth.

Dr. Buczynski: Yes, there were a *lot* of new ideas there.

Ron, Stephen says that mammals don't want to engage with each other if they don't feel safe. Can we use this information? How can we use this in our practice?

Dr. Siegel: That's an excellent question because so often we, or our clients or patients are ashamed of

the difficulties they have with other human beings, including the fact that most of us find other human beings, at least on regular occasions, to be frightening in some way or another.

We respond to our difficulties with others in all sorts of defensive ways that often include averting our gaze or withdrawing in some way, and then feeling a sense of shame or inadequacy when that happens.

It can be *very* useful to simply point out that this is a natural consequence of having three broad motivational systems that are arranged in something of a hierarchy.

Dr. Porges didn't exactly lay these out, but he alluded to this - we

"We respond to our difficulties with others in defensive ways that often include averting our gaze or withdrawing, and then feeling a sense of shame or inadequacy."

basically have the fight or flight system, which involves adrenalin or epinephrine and is responsible for getting us out of jams really quickly. If we're in danger, that danger takes precedence over everything else.

Then we have this other dopaminergic system, which has to do with seeking rewards – whether it's food or status or something else – that system operates if we're not super-threatened in a fight or flight way.

"The 'tend and befriend' system can only operate when the fight/flight and dopaminergic systems are not 'taking over the show."" The third and most subtle system is really this "tend and befriend" system. It is our mammalian nurturing system that operates on oxytocin. This system can only operate when the fight/flight and dopaminergic systems are not "taking over the show."

Just to think of it in these terms can make us be a little more compassionate with ourselves when we find that we're having difficulty with those "scary other humans."

Dr. Buczynski: You know, Ron, my reaction to what you just said – which I thought was a *very* interesting synthesis of Stephen's work – sounds physiologically a bit like Maslow.

Dr. Siegel: Yes, that's interesting – and it is like the hierarchy of needs...It's true.

Dr. Buczynski: Joan, if the vagus nerve is key to regulating behavioral state, is there any way we can work with that idea? How can we use it in our practice?

Dr. Borysenko: There are a lot of ways. For example, there are a number of things that affect the vagus nerve, which in turn affects heart-rate variability.

We can teach people how to maximize good vagus nerve activity in appropriate situations.

For example, alcohol actually decreases heart-rate variability. What that means, then, is the sympathetic nervous system takes over and we get a little bit less smart – we lose some of our cognitive control over those reptilian brain functions.

"We can teach people how to maximize good vagus nerve activity in appropriate situations."

That is why, for example – if you look at heart-rate variability, there is actually a literature that shows it can predict relapse in substance abuse. You want to have heart-rate variability higher – so that's a kind of higher vagal tone...

Heart-rate variability is the fact that your cardiovascular system is supple and flexible, and just as in all

"Heart-rate variability is the fact that your cardiovascular system is supple and fexible. We want people to have a higher heart-rate variability - a more flexible nervous system." systems, that is what you need.

If you're looking at an electrocardiogram, there's going to be a difference from heart beat to heart beat in terms of the amount of time between the heart beat. There are some physiological functions with aspects of the tracing on the ECG – what is called the R2R function – that change.

Heart-rate variability is quite easily measurable; you can even measure it to some degree with a blood-pressure cuff.

This is the idea: we want people to have a higher heart-rate variability – a more flexible nervous system – and you can

do that in a number of ways.

One of those ways – which is very simple and something that Kelly McGonigal spoke of earlier in the series, Ruth, is brief meditation exercises – just watching your breathing for five minutes.

Another way of doing that is to work with the breath – the simplest way being to inhale through the nose, exhale as if you're breathing through a straw, and to do that for about two minutes. Reducing your breathing rate to between four and six breaths per minute increases heart-rate variability.

A third way, which many of us use and recommend to our clients, is to get more exercise!

Exercise does an *incredible* amount for the nervous system. In particular, exercise that will increase heart-rate variability is interval training.

The idea there is that you go, as in a sprint – in a burst – and then after that, you slow down and let your heart rate return to normal, and then you can bring it up a little bit. The idea is you're your heart rate is therefore made more flexible – you have increased

heart-rate variability and the vagus can function in a better way.

What we know in general is when heart-rate variability is decreased, we have problems with emotional regulation, and what we want to do is have better emotional regulation by increasing heart-rate variability.

Dr. Buczynski: That was brilliant. That was *really* interesting. Thanks.

Dr. Borysenko: You're welcome.

Dr. Buczynski: Ron, Stephen talked about interoception – what can that tell us about a client's feelings?

"Interoception means
paying attention to
what is happening
in our own bodies."

Dr. Siegel: A lot! Interoception means paying attention to what is happening in our own bodies, and the way that we experience another person's feelings is by attuning to what is happening in our own bodies.

Carl Rogers said empathy is "To sense the client's world as though it were our own without losing the awareness of the *as if*."

The way that we can sense that is by looking inward - I shouldn't say *looking* inward - it's by *feeling* inward. It's by noticing the constriction in the chest, the tightness in the throat, the feeling of the tears coming to the eyes.

All of these different events happen when, ostensibly, our mirror neurons pick up on the feeling of another. When this happens interoceptively, it is the noticing that allows us to identify what might be going on in the world out there.

"Reducing your breathing rate to between four and six breaths per minute increases heartrate variability."





There are many ways to do this: you can do it through mindfulness practices; you can do this through yoga practices that attune you to what is happening in the body; you can do it through Eugene Gendlin's focusing technique – there are many different body therapies that contribute to this.

This is one of the nice things that Stephen says: interoception's critical nature is a non-evaluative attitude toward whatever we find.

It is not that this is good – this feeling that's arising in the body or that it is bad – but rather that we're simply *noticing* that it is arising in the body and we're able to use that information to understand the other.

Dr. Buczynski: Joan, Stephen says that people with borderline personality disorder may have an "overly conservative neuroception strategy."

It was interesting the way he referred to them or likened them to being a TSA agent and not letting anyone on the plane...Is there any way we can work with that concept?

Dr. Borysenko: I thought that what Stephen had to say about this was absolutely brilliant.

What he talked about clinically, all of us can use – not only in our clinical practice, but with friends, with family, with anybody – to make them understand that what we're experiencing is for us absolutely and perfectly normal.

I love the idea of talking to somebody, for example, who has a borderline personality issue, and saying, "What a good job you have done -a

tremendously good job in finding ways to make yourself feel safe."

We know from so much research that when you feel safe – when things are normalized, then you're calm enough to create new circuits from your cortex down to those parts of your brain, both the midbrain and the brain stem, that tend to run the show.

"When you feel safe you're calm enough to create new circuits."

That safety – and Stephen returned to this so many times – is so very, very important.

Ron, you just said it so well...empathy is creating safety, and that brings me back to the overarching idea

"In any kind of therapy, we are the medicine. Our capacity for selfregulation creates a way for the people we work with to come into our 'safe frequency' and learn to self-regulate." that, in any kind of therapy, we ourselves, as therapists, are the medicine.

Our capacity for mindfulness, for self-regulation, creates a way for the people we work with to come into our "safe frequency" and learn to self-regulate.

Dr. Buczynski: Interesting. I'm afraid we're out of time.

Next week will be the last week of the main part of the series, and we have Pat Ogden with us.

"What we're experiencing is absolutely and perfectly normal."

"Interoception's critical nature is a non-evaluative attitude toward whatever we find." We're going to be talking there about the brain and the body, and why we can't forget about the body when we're studying the brain.

We'll also be talking about why you can't *talk* your way out of trauma, and how mindfulness heals both the brain and the body –you won't want to miss next week.

Meanwhile, we'll be sending you very shortly an email; it will have a link to Stephen's book and will also have the link to the Comment Board.

Please go to the Comment Board and tell us how *you* are going to use what you heard tonight. There were a whole lot of new ideas here tonight, so be sure to go and tell us about that – and read what other people are saying.

I have found some *fascinating* perspectives from people on the Comment Board and what stood out to them – It's like another giant talkback session!

Use the Comment Board and be sure to check it out. We would love for you to leave a comment – but even if you don't, be sure to read what others are saying.

Meanwhile, if you're a Gold member, in a few hours, I will send you the link to tonight's audio and video.

On Friday, I will send you the transcript. I'm also going to be sending you the "Next Week in Your Practice" as well as the "Quick-Start Guide."

In the "Next Week in Your Practice," Bill O'Hanlon and Elisha Goldstein will be talking about how you can use Stephen's ideas in *your* practice.

Then, in the "Quick-Start Guide," we've put all of the ideas into a practical, take-home, ready-to-use guide so that you can read them quickly; you can read them every day – it will take you less than ten minutes to get these eight to ten ideas.

If you're not a Gold member and you'd like to be, just click on the link right below and you can sign up.

Take good care everyone, and I'll see you next week.

About The Speaker:



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 emergence of social behavior.

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

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About The TalkBack Speakers:



Since 1989, Ruth has combined her commitment to mind/body medicine with a savvy business model. As president of The *National Institute for the Clinical Application for Behavioral Medicine*, she's been a leader in bringing innovative training and professional development programs to thousands of health and mental health care practitioners throughout the world.

Successfully sponsoring distance-learning programs and annual conferences for over 20 years, she's now expanded into the "cloud." During the past 4 years, she's developed intelligent and thoughtfully researched teleseminars, and most recently webinars, which continue to grow exponentially.



Joan Borysenko, PhD, has been described as a respected scientist, gifted therapist, and unabashed mystic. Trained at Harvard Medical School, she was an instructor in medicine until 1988.

Currently the President of Mind/Body Health Sciences, Inc., she is an internationally known speaker and consultant in women's health and spirituality, integrative medicine and the mind/body connection. Joan also has a regular 2 to 3 page column she writes in *Prevention* every month. She is the author of nine books, including New York Times bestsellers.



Ronald Siegel, PsyD is an Assistant Clinical Professor of Psychology at Harvard Medical School, where he has taught for over 20 years. He is a long time student of mindfulness meditation and serves on the Board of Directors and faculty of the Institute for Meditation and Psychotherapy. Dr. Siegel teaches nationally about mindfulness and psychotherapy and mind/body treatment, while maintaining a private clinical practice in Lincoln, Massachusetts. He is co-editor of *Mindfulness and Psychotherapy* (Guilford Press) and co-author of *Back Sense: A Revolutionary Approach to Halting the Cycle of Chronic Back Pain* (Broadway Books).