Polyvagal Theory and Trauma: An Interview with Stephen Porges, PhD

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ABSTRACT *Polyvagal theory is reviewed in a short introduction, followed by a conversation with Dr. Stephen Porges. Porges's history as research director with the Rolf Institute® (now the Dr. Ida Rolf Institute®) is discussed, as well as his body perception questionnaire, the term neuroception, and how Rolfing® Structural Integration can be polyvagal-informed.*

Introduction to Polyvagal Theory

Before diving into our interview with Stephen Porges, PhD, we offer a brief discussion of his *polyvagal theory* (Porges 1995) for context. The short story is that the vagus nerve mediates a range of physiological responses from terror to compassion, and this is important to us as Rolfers because clients in Rolfing sessions may display vagus-nerve-mediated immobilization states, either immobilization without fear (part of *compassionate social engagement*) or immobilization with fear (which can be associated with traumatic events). The good news is that we can steer towards compassionate social engagement through how we interact. Compassionate social engagement occurs when, with caring intent, you allow your gaze to include the face, eyes, and whole form of another person while also staying connected with you own at-ease self-regulating system. Offering this state of presence is already a neurobiological intervention, because it works to modulate the state of the receiver's nervous system. It supports and builds rest-and-digest states in the client's nervous system. Some have called polyvagal theory 'the love theory' because

it provides an autonomic nervous system explanation for the behavior of human intimacy (Porges 1998).

Early anatomists named the tenth cranial nerve (CN X) the vagus nerve. *Vagus* is Latin for wandering, and their dissections showed that the nerve wanders. Like all cranial nerves, it is bilateral, with the left and a right vagus nerve emerging from the brainstem. Although we can simplistically think of the left and right as having mirror-image pathways, it is important to note the left and right vagus' unique paths in the cardiac space (see Figure 1). With that in mind, the vagus nerve innervates a posterior portion of the dura mater, parts of the surface and meatus of the ear, the soft palate, the carotid sinus, and part of the pharynx. As already mentioned, it has a cardiac branch, and also travels to the larynx and pulmonary plexus. The abdominal thoracic branches reach widely throughout the subdiaphragmatic organs including the stomach, omentum, liver, pancreas, duodenum, small intestine, ascending colon, hepatic flexure, and descending colon (Barral and Croibier 2013). Early animal experiments showed that high tone in the vagus nerve lowered the heart and breath rates of the organism. Accepted knowledge about the vagus nerve is that it is part of the parasympathetic nervous system, involved in the rest-and-digest state of the autonomic function of mammals.

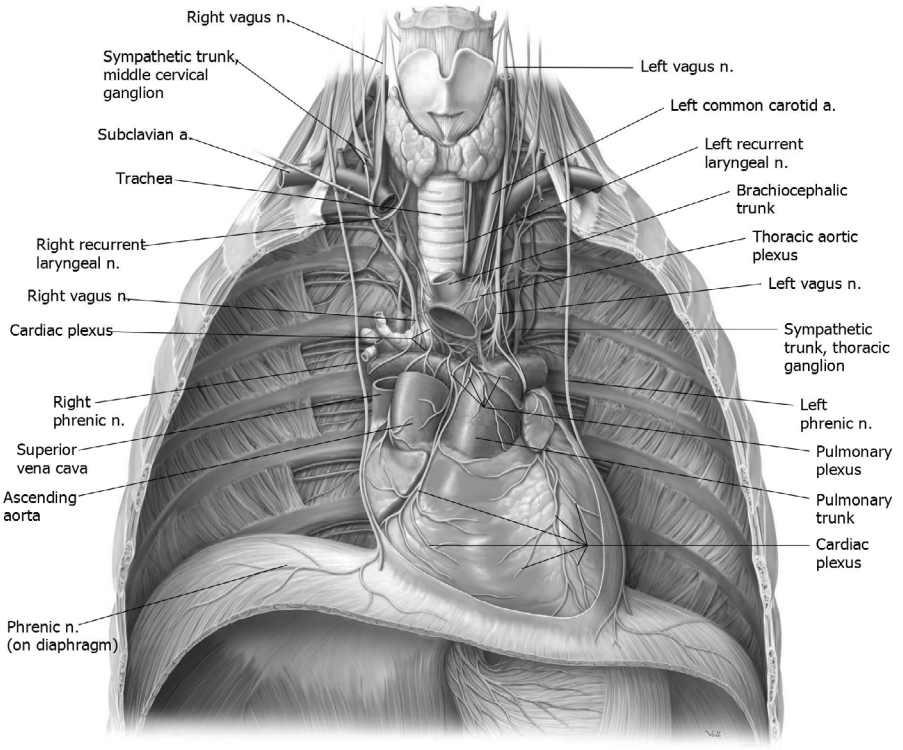

Figure 1: Left and right vagus nerve pathways through the thoracic cavity. Copyright Thieme Medical Publishers, Inc. 2017.

This is true, and the vagus nerve is also much more than that. It is polyvagal not univagal. What Porges and his team observed was the vagal paradox. They were measuring neural tone in the vagus nerves of both premature and full-term babies. As is logical, full-term babies had high vagal tone reflected in high heart rate variability, good growth rates, and healthy trajectories as they moved into childhood. With the rest-and-digest state dominant, development proceeded on a rosy-cheeked path. But infants who were born prematurely and had complex health challenges also had high vagal tone reflected in bradycardia and apnea, which was potentially lethal. The paradox of how both of these things can be true is that while the vagus nerve lowers breath and heart rates, it has two different outgoing pathways by which it delivers this message and the pathway used is context dependent: compassion or trauma.

A nerve is really a bundle of more bundles of nerves, so within the vagus nerve is bundled the ventral vagus nerve and the dorsal vagus nerve. Both originate in the brainstem, but while the ventral vagus originates in the ventral aspect of the brainstem the dorsal vagus originates in the dorsal aspect. The brainstem location of the ventral vagus is in close relationship with the cranial nerves involved with facial expressions and voice. In contrast, the dorsal vagus nerve is an old pathway that we share with primitive fish – who had limited responses to life threat. They could flee, burning up a lot of energy to move away from predators, or they could freeze their motion, conserve resources, sink lower into the cold water, and become very still. Similarly, in mammals the dorsal vagus nerve lowers the heart and breath rates as a subconscious survival strategy to immobilize in response to perceived threat. Conversely, the ventral vagal nerve is a mammalian neural pathway that becomes active under warm, prosocial circumstances. When we look a loving family member in the eyes, we smile as they smile. The nervous system experiences safety, and this increases ventral vagal activation leading to lower heart and breath rates and also immobilization but without fear.

In the vagal paradox, Porges reported that premature infants had low ventral vagal tone, a warning sign that life was at risk. In contrast, the full-term infants had high ventral vagal tone, associated with successful bonding with caregivers and active communication with facial expressions and vocalizations.

Porges coined a new term, *neuroception*, to describe the global process of the nervous system scanning for safety in the internal and external environment. This relates to a third bundle of neural tissue within the vagus nerve that is afferent, taking information from the body to the brainstem. Porges reports that 80% of the vagus nerve tracts are afferent. Said another way, the vagus nerve is sensory. All the terminal destinations listed above have sensory information collected and sent 'upward' into the brainstem for higher order neural consideration. The brain is sensing the organs via the information conveyed by the vagus nerve. This confirms that bottom-up manual therapies like Rolfing SI, practiced with compassionate social engagement and intelligent touch of peripheral structures (especially the organs) are a way to access and affect the neural tone of the brainstem. When we work with the abdominal or thoracic viscera, anterior neck structures, temporal bones, or muscles of the face,

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With this background, we'll dive into our interview with Porges, who has been interacting with the Rolfing community since the 1970s. If you want to learn more about polyvagal theory, there are many articles and books that describe the theory and clinical application (see Porges 2021a for a list). We also invite you to read the article on page 50 for a conversation with Randall Redfield, the CEO of Polyvagal Institute, which discuss the coursework they are offering to support practitioners in understanding the whole polyvagal model.

Interview with Stephen Porges, PhD

Lina Amy Hack: So good to see you for this interview, thanks for meeting with me. Can we dive right into some anatomy about the vagus nerve? Can you clarify the difference between the left vagus nerve and the right vagus nerve?

Stephen Porges: Hi Lina, nice to meet you. Now to your question. The vagus is lateralized, but the right vagus is the major pathway to the heart's pacemaker, the sino-atrial node.

LAH: It took me a while to anchor my understanding of polyvagal theory in the actual anatomy of the vagus nerve. Do you keep a mental picture of the anatomy of this nerve as part of your working model? And how would you describe your visualization of the vagus?

SP: I initially focused on the two pathways within the vagus – one originating in the dorsal or back of the brainstem and the other originating in the ventral or front of the brainstem. As these primarily motor pathways exit the brainstem, they are joined with a third sensory pathway to form the cranial nerve known as the vagus. The vagus exits the brainstem providing neuroanatomy pathways to virtually all our visceral organs.

LAH: Is the ventral vagus is more closely associated with heart regulation, with not many branches going below the diaphragm, while the dorsal vagus has more nerve fibers with the subdiaphragmatic branches? I guess I am asking, can you clarify the difference in the ventral versus dorsal terminal branches?

SP: Neuroanatomists state that the primary motor fibers originating in the ventral nucleus of the vagus go to organs above the diaphragm, and the primary motor fibers originating in the dorsal nucleus of the vagus go to organs below the diaphragm.

LAH: Thanks for taking that deep dive into the tissue. Some of our readers may not know that you were the Director of Research for the Rolf Institute of Structural Integration (RISI, now Dr. Ida Rolf Institute) in 1990 and 1991, appointed by Alan Demmerle, then president of RISI. You have published in this journal before. Back then you published a research article where you laid out clear stages of what information needed to be gathered about Rolfing clients, perceived expectations, and outcomes (Porges 1991 Jan/Feb). You published a full questionnaire in *Rolf Lines* and asked Rolfers to use this measurement tool with their clients and mail the completed questionnaires back to you (Porges 1991 Fall).

SP: Yes. I basically said, as with any type of new intervention model, everyone wants what we would now call 'efficacy research'. Research that shows it works. Which often requires a different model because showing that something works is not really a scientific question. I wanted to find out, before trying to generate large amounts of funding to do research, what does the client base think of the intervention, were they getting something from it? And so, I developed a questionnaire.

At the start of that project, while talking to Alan Demmerle, I said, first, you have to use subjective tools. People want Rolfing work and they think what they're getting is helpful. So, we started to structure the questions that asked:

1. Who is receiving Rolfing work?
2. Why is the client choosing Rolfing SI?
3. What expectancy does the client have of Rolfing work?
4. What is the outcome the client perceived from their Rolfing sessions? Were there benefits or contraindications?

I don't remember what we found, but the questionnaire provided the roots of what is now the Body Perception Questionnaire (BPQ), which is available online on my webpage (Porges 2021b).

LAH: I saw that, interesting measurement tool. Very detailed. The questions ask the participant to report about a wide variety of body sensations; researchers must find it very useful.

SP: It's been translated into about a dozen languages and it's getting a lot of citations. We are conducting research to demonstrate that it's a good surrogate for measuring physiology. I started that questionnaire with the intention to build a database, or should I say an item-based list of modified items, subjective measurements of physiological activity – and actually, this preceded even polyvagal theory. Over the decades, it was online

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and people would use it, and I [saw] I need[ed] to go back and look at factor structures in the questionnaire. Revised it. And this has occurred within the past five years. Now we have sub-scales within the body perception questionnaire. For example, it examines, reactivity above the diaphragm and reactivity below the diaphragm. It is really lining up very nicely with people who have trauma histories or people who have anxiety. It gets reflected in their subjective view of the autonomic nervous system.

Polyvagal theory emphasizes the important influence autonomic state has in how we react to the context, objects, people, and challenges in our life. To stand back from it is to realize that if your body is in a state of defense, if you're in a sense under constant threat, the neural regulation of your visceral organs changes. What Rolfing SI does, it comes at it from a structural perspective and says, if you shift the structure, the underlying functionality of the nervous system will change as well. And I think that is an important contribution, and it's a different perspective from a neurocentric one. Although, Rolfing SI emphasizes this structural-centric view, you don't have neural function without structure. These become portals of intervention.

LAH: With the BPQ, we can now ask verbal questions and gather information about autonomic nervous system function.

SP: The interesting part is when we skate across the ice of the world of trauma. Rolfers are doing that as well, people come in and 'want to be fixed'. There is an acknowledgement that something is not right and their body has restructured in a defensive mode, curling in, pulling in. I could always tell when the academic world was getting too much for me because my rib cage would change! A little pushing on it was liberating.

LAH: Yes, sometimes the body is reacting to something and the mind hasn't wrapped words around it, or hasn't brought it to our conscious awareness, yet the structure has reacted. When I'm aware that I'm curling forward I say to myself, "I'm doing this, why?"

SP: This is the whole idea of neuroception: the body and the nervous system react in a way that you're unaware of what it's reacting to, but you are aware that it reacted. Your interoception says, "I've responded." The issue is, your last point is the 'why' you did that – ask 'why' and you start building narratives. I would say most of the time those narratives are wrong. They become who we are. They're the glue that we use to define ourselves. We always justify why we are doing these things as opposed to being a good observer to what our body is doing. If the body is under a state of threat, that's what we need to acknowledge. Then once we honor that, we start building greater resilience. We can't take all the challenges out of the way in the environment, but those challenges don't always have to trigger defense.

LAH: Absolutely. Very much part of what we focus on. How did you first hear about Rolfing SI? Presumably you were a person with a PhD out there in the world, getting your research done, and then somewhere you found bodywork?

SP: I always give credit to Peter Levine who had a close relationship with the Rolfing community. Peter was always a curious expansive thinker. When Peter was working on his PhD thesis and I was a faculty member at the University of Illinois – about 1975 – Peter was interested in autonomic activity, [and] in his persistent and interested way [was] on a mission. I was able to help him to understand the phenomena that he was observing. It had a lot to do with structure, a lot had to do with movement, position, and posture. Peter was an interesting guy and I found his comments and perspective interesting.

Peter invited me to a meeting at Esalen about the biology of the affectional bond, and that was really where I started to meet this other group, the Rolfers. And so, I started to meet these people, interesting people, not academic, not disciplined in the way that academics are. I was already a successful faculty member, I had an award from the National Institutes of Mental Health, called the Research Scientist Development Award, [and] with this award I was able to do whatever I wanted to do. It paid my salary for more than nine years to, in a sense, be exploratory, to learn. I took it seriously. I was learning physiology, anatomy, methodology, mathematics, and "Let's see what other people can bring." So, I found Rolfers to be very interesting.

One thing I learned along the way is – at least within the academic world – people are too concerned about being evaluated. In a sense, they are reflecting that their own bodies are under threat. And just like a traumatized person can't hug another person, can't allow another person into their world [because their body is under threat], academics who are under constant threat can't entertain alternative ways of thinking. I fortunately wasn't biased to that way. I don't know where the boldness or the strength came from in retrospect, but I wasn't threatened by any of this. I found it interesting.

LAH: Thank goodness. That is to all our benefit. Did you ever have a Rolfing Ten Series?

SP: Yes, I had the entire Ten Series. I worked with John Cottingham. I would train John to do research and he would do the manipulations on me. It was a good friendship. We would go for coffee after the Rolfing session to discuss the underlying neurophysiology of the experience.

LAH: Well, that makes you an interesting researcher as well, did your own body inform your research? Or does your own body inform your sense of nervous system function?

SP: Of course, it does. Polyvagal theory gives you a language to describe that and you can take it back in time. I could take it back to when I was a teenager and played the clarinet. I talk about breathing in my workshops, concepts like playing a musical wind instrument is like pranayama yoga, it is breath, it is with the facial muscles. That, in polyvagal terminology, is a social engagement system and it's the ventral vagus. It's the calming system, the coordinator, and the cheerleader. It keeps you together. It gives you the resilience.

When I go back in time and think about playing the clarinet, I can feel it in my body, the calming and the ability to think.

You can translate that into Western-world interest in meditation, people start to understand that if you breathe out slowly, if you extend the duration of your breathing phases, that you become more melodic in your voice. If you smile, if your facial muscles are working, it's all coming into the brainstem area, not just calming, but it coordinates with other parts of your autonomic nervous system to make them more resilient, so they can respond to threat and then rapidly calm back down.

LAH: I love how you say that, I feel more relaxed right now as we talk about it. So interesting that Rolfing work was a part of your landscape as a cutting-edge researcher. You and Cottingham published work together, as well, about Rolfing work and the pelvic lift (Cottingham, Porges, and Lyon 1988).

SP: Right, two publications together actually, a second one about the effects of soft-tissue manipulation. John Cottingham is the senior author on both of those. [They are] something for people to look into.

LAH: I agree, it's not often Rolfing SI appears in the peer-reviewed literature.

SP: They are important. I asked John to deconstruct the Rolfing sequence to identify elements that could be studied in a laboratory setting. John said, "Let's look at pelvic tilt," and he got this device to measure pelvic tilt, then he evaluated people before and after. And the beauty of the procedure that he was doing – he said that as you tilt the structure of the sacrum, the manipulation had a neural regulation effect. What we now know is this is the newer ventral vagal system increasing in tone. Think about dancing, think of hula, think about yoga traditions of breathing with posture shifts, various dance routines of pelvic tilting, and even think about pelvic tilting in intimate positions, because it has a physiological consequence, it increases vagal activity. It keeps the nervous system from going into defense. That promotes the ability to maintain erection and to have sexual intercourse.

The other part of that story, and this is now a recent part, is that if people have trauma histories you may have sexual problems. If they have trauma histories and their autonomic system is re-tuned to be more threat- or defense-oriented, then you have impotency, lack of orgasm. We have been getting this information from work we're doing now with our BPQ. People present with trauma history; the data has that cluster. Females have similar things but the effect is even stronger in males. The bottom line is that through simple structural manipulations we could see in the Cottingham study how the autonomics were impacted.

The other paper dealt with deep abdominal massage (Cottingham, Porges, and Richmond 1988). The interesting part was that the pelvic tilt intervention gave you this insight into Rolfing SI – that dynamic structural manipulation changed neural feedback – but deep abdominal massage changed autonomic regulation; not just immediately, it lasted for more than a day. And in many ways Rolfers see this, they see glows in the faces of their clients, even though they may be screaming or in pain when they are doing this, but they have this exuberant glow and that's part of this autonomic system coming on and feeling benevolent.

I also wrote a chapter for the series Oxford Library of Psychology: *The Oxford Handbook of Compassion Science* (2017), the chapter was titled 'Vagal pathways: Portals to compassion', and in a sense Rolfing SI fits into that world too. When you start shifting the structures and enhancing this ventral vagal regulation, people become more benevolent, more compassionate, meaning they're less defensive.

LAH: That brings a lot of ideas to my mind. A question Rolfers are always mulling over is why do our interventions last? I believe we are reinforcing some neural circuitry; we are inviting someone to spend time in their wellness circuitry. And that the relationship and the time spent there is reinforcing.

SP: I totally agree. This is part of the model of what I would call polyvagal-informed therapies. As you know I developed an acoustic intervention, the Safe and Sound Protocol (SSP). The SSP basically presents modulated vocalization that function as the distilled essence of trust. The sounds occur in the frequency band of a mother's lullaby. Certain frequencies our nervous system can't refuse. I thought five, one-hour sessions would be sufficient for permanent changes. For many individuals it did [that]. Just like you, I thought the social reinforcement would reorganize that individual.

What I didn't understand: because we all entered the world of intervention being very naïve, we don't realize that many people are going into environments that are not safe, but potentially very dangerous. To be an accessible person is to be vulnerable, and a nervous system can get hurt. When it gets hurt, people get ill, they get a cold, they get sick, and the nervous system shifts into that state. And now the cues don't work. The body has shifted back to this other state.

LAH: In my Rolfing practice, I'm known to be able to handle people who are suffering a long time with chronic pain. They are often frustrated because the physicians haven't found the solution to their pain. I tell them that is great news: there is no cancer, no serious degeneration, and in chronic pain conditions Rolfing SI can potentially make a big difference.

SP: I've been spending Wednesday evenings in a think-tank seminar group of spinal surgeons, pain physicians, and psychologists. Their real concern is that surgery doesn't help. They got really enthralled with polyvagal theory because it helped them with their patients when they took a polyvagal approach, an approach that treats pain as part of our global defense system. If we are safe with others in an interaction, our cues of safety reflexively downregulate cues of danger including cues of pain.

I hurt my back this [past] summer. I twisted and I was in severe pain for five weeks. I couldn't sleep in a bed. However, I was still doing things like this. I was doing webinars online. I even did a full-day workshop. And I was pain-free during those periods of time, because I was interacting with others.

LAH: Oh wow, yes.

When you start shifting the structures and enhancing this ventral vagal regulation, people become more benevolent, more compassionate, meaning they're less defensive.

SP: Even though it was a two-dimensional screen, it was sufficient for my nervous system to not be in a state of defense. During the pandemic, this kind of interaction, the Internet, has been my social platform. And my platform is to communicate to others. And as long as I maintain my presence, my voice, my intentionality, pain doesn't even exist. Rolfers are seeing people whose bodies and minds, including their sense of self, are under constant threat.

I always like to use the academic world as an example, you can generalize from that. As professors, it's all about evaluation, it's all about ranking. It's all about publications getting evaluated, grants get evaluated, everything gets evaluated, how much money you bring in. Everything is evaluated all the time. But it's not just the faculty – think about the students. They start into elementary school, into kindergarten where there's demands, and a lot of the kids are telling you exactly what's going on. They're talking with their guts. They're in pain. They're telling you their bodies are being really threatened. Why do we support a culture that places the beauty of human potential into a state of constant threat? [Constant evaluation pushes in] as a constant threat, an adaptive retuning of the autonomic nervous system but really of our structures as well. And that's what Rolfing work does.

Right now, my ventral side is showing [in my posture] (see Figure 2A), and that can be interpreted being an accessible person or a vulnerable person. And once the mind says "vulnerable," what happens? [Gestures forward flexion; see Figure 2B]. You see this as Rolfers, you see [demonstrates defensive gestures protecting the chest], and you say, "How do you feel when you loosen up that area?" They say, "I can breathe again." What they are really saying is, "I'm in the world. I'm reembodied."

I think Dr. Rolf had an insight that structural manipulation was an efficient trigger to the nervous system. In the world of medicine, the focus of treatments is pharmaceutical or surgical, both of which are often agnostic to the nervous system. Medicine does not consider structural organization. It treats structure as causal, but it does not acknowledge the flexibility of the organization of structure. Perhaps, Dr. Rolf was saying that optimal function of the body would spontaneously emerge if the building blocks of the body are rearranged. It was a very insightful model that has been helpful to many.

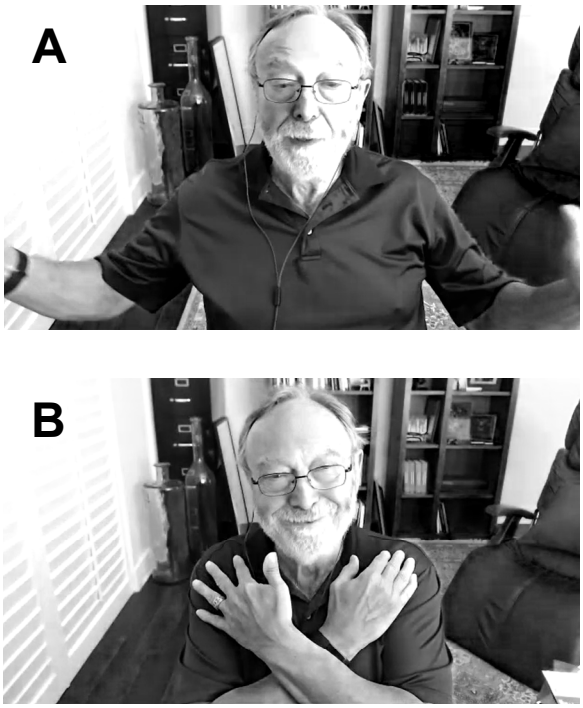

Figure 2: Dr. Porges gestures an open ventral aspect (A) and a defensive posture of protecting the ventral side of the body (B).

The caveat that we have to all understand is that we really can't fix others without leading them on a psychoeducational journey. You can restructure, but they'll come right back unless they have a greater awareness of the world they are in. It's the same thing in my work. I can use an intervention that makes people get accessible, but if their body interprets accessibility as vulnerability, it's going to be threatening to them. If their body interprets accessibility as its own agenda in life, then they're smiling. We are a social species, [but] this culture teaches everyone to be frightened of others; not to be benevolent or to be generous, but to take care of ourselves first.

I see polyvagal theory as part of my own vocabulary, as a manual of how to live life. Rolfing [SI] fits well within it, because once you have an understanding of getting the body out of defense, it promotes sociality – and sociality supports the body being out of defense. The ability to coregulate supports this wonderful capacity of being a social mammal. And so, I would actually give this back to you as a Rolfer. Based on your experience of having Rolfing work, how did it make you feel?

LAH: It was a profound coming home. My Rolfer, I felt like he brought me home and gave me an adult form that was waiting to emerge.

SP: You became embodied through receiving Rolfing work.

LAH: Yes, absolutely.

SP: I think we can't be co-regulating anyone else unless we can literally regulate ourselves. What that means is our nervous system is regulating our structures and the feedback from structural integration work is not just in the structure. The 1980s work with John Cottingham that we talked about, it really emphasized that structure affects normal regulation: how people feel afterwards, how they relate to each other; it enables social interaction to be a neural co-regulator of our physiology.

Another question for you, the people that you gravitate to work with, do many of them have comorbidities that reside below the diaphragm?

LAH: Yes, for sure.

SP: Okay, so you've had miraculous reversals, right?

LAH: Yes, one pops to mind right away.

SP: The subdiaphragmatic reaction is telling you that the autonomic nervous system is in the state of chronic defense. If they have constipation, you would say constant defense. If their body is falling into a shutting down, almost dissociative defensive mode, they have diarrhea, constipation, and/or irritable bowel syndrome. These are our body's well-wired reactions to life threat and to trauma. We have to, in a sense,

respect what our body's trying desperately to tell us.

LAH: I am so grateful to have been taught how to be in my body, in my own psychology, in my own nervous system. As a Rolfer my state regulation is a huge influence on the session. When I was doing my psychology degree, it struck me that people who are on the path towards being therapists, they aren't told how to be in their system. We need to do the personal work that comes up, listen to our bodies.

SP: Well, you will be sending cues to your clients.

LAH: Exactly.

SP: Your point about the training of psychologists, most of that training is within the world of mental activity, without an understanding that we are an integrated nervous system. We should focus on the brainstem instead of the cortex. The brainstem is regulating all the organs in the body. Or stated another way, all the organs in the body tend to be regulating our brainstem. The state that our brainstem is in allows these portals of activity to go up to higher cortical areas. If the brainstem detects cues of defense, forget accessibility of ideas, let alone other people. When it comes to teaching how to do therapy, some [students are] just going to be great, they have intuitive understanding. There are people who are super co-regulators. They walk into the room and it doesn't matter what they say, their presence, their facial expressivity, the intonation of their voice, their gestures . . . all you do is smile, and you're very happy and feel safe with them.

LAH: One of my psychology professors helped me understand the placebo effect more deeply, I had previously found that word to be offensive, like a weapon used against me to dismiss the value of my work. But this professor helped me see there is something very important to be learned about the placebo effect. Would you say so?

SP: I was asked to talk at the National Institute for Complementary and Alternative Medicine – it has changed its name since then. I wanted to talk about the placebo effect because it is the body's own healing mechanisms. They wanted me to talk, but they didn't want me to use the term placebo effect. I think we have missed the importance of placebo in contemporary medicine. If clients feel safe, they no longer have pain and they no longer have these diseases. That, to them, is a placebo effect because they don't understand the linkage between our own sociality and our physiology.

Turning off the states of defense enables the body's own healing properties to be optimized. Physicians have never been taught that, they think the power of health is giving drugs or doing surgeries, not in their hands in terms of support and love and trust. That's why medicine is so intrusive for many people, so threatening, because it is oriented to evaluation of the body, not about respecting, honoring, and learning about the body.

LAH: Those surgeons you speak with, you're telling them that they are the most threatening ones out there?

SP: What's interesting is the one who created the group quit surgery and he does group psychotherapy now, brings people to pain-free states through talking. He's been very effective. Each time he saves someone from surgery, he feels really good because the surgeries from his perspective don't work and they can even be catastrophic.

LAH: All Rolfers have seen that.

SP: It's a heartbreaker, we all have had friends who don't want to listen. They want to go to their surgeon. The issue is, we have to be re-educated to understand that acute pain is really something important. Our nervous system knows that, but once the tissue or the organ or the structure heals itself, chronic pain doesn't have that adaptive function. We have to step into giving up the pain. Our bodies have to be convinced – not on an intellectual level, but on a visceral level – that it is safe enough to give up those defenses.

What if Descartes had been polyvagal informed? [He said,] "I think, therefore I am." What if he had said: "I feel myself, therefore I am." What would Western civilization be like?

LAH: Wow. That is worthy of contemplation. Any final thoughts for our readers?

SP: There is a compassion movement taking place in our culture now. With Rolfers, you have stepped into the world of trauma, you understand that people with very complex and very difficult histories often don't want to share them. They feel the pain again when they do. The point is, we need to be good witnesses. People want to right the wrong that has been done to others, [and] this is moving too quickly because the first step is to just be present, to be non-evaluative. Let the person express their feelings, without evaluation by us the listeners. This allows them to resolve. They don't have to defend why they are expressing it. They just express it.

LAH: Beautiful, thank you for sharing your compassion science with us.

SP: You're welcome.

Stephen W. Porges, PhD, is Distinguished University Scientist at Indiana University where he is the founding director of the Traumatic Stress Research Consortium. He is Professor of Psychiatry at the University of North Carolina, and Professor Emeritus at both the University of Illinois at Chicago and the University of Maryland. He served as president of the Society for Psychophysiological Research and the Federation of Associations in Behavioral and Brain Sciences and is a former recipient of a National Institute of Mental Health Research Scientist Development Award. He has published more than 350 peer-reviewed papers across several disciplines including anesthesiology, biomedical engineering, critical-care medicine, ergonomics, exercise physiology, gerontology, neurology, neuroscience, obstetrics, pediatrics, psychiatry, psychology, psychometrics, space medicine, and substance abuse.

Before becoming an Advanced Rolfer, Lina Amy Hack was doing water quality laboratory work with her biochemistry honors degree (BS) from Simon Fraser University. Since becoming a Rolfer, she

I think we can't be co-regulating anyone else unless we can literally regulate ourselves. What that means is our nervous system is regulating our structures and the feedback from structural integration work is not just in the structure.

There is a compassion movement taking place in our culture now. The point is, we need to be good witnesses. People want to right the wrong that has been done to others, [and] this is moving too quickly because the first step is to just be present, to be non-evaluative.

completed the Somatic Experiencing® training and an honors psychology degree (BA from University of Saskatchewan) where she did child development research on parental touch patterns. Lina is also the co-editor-in-chief of this journal.

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