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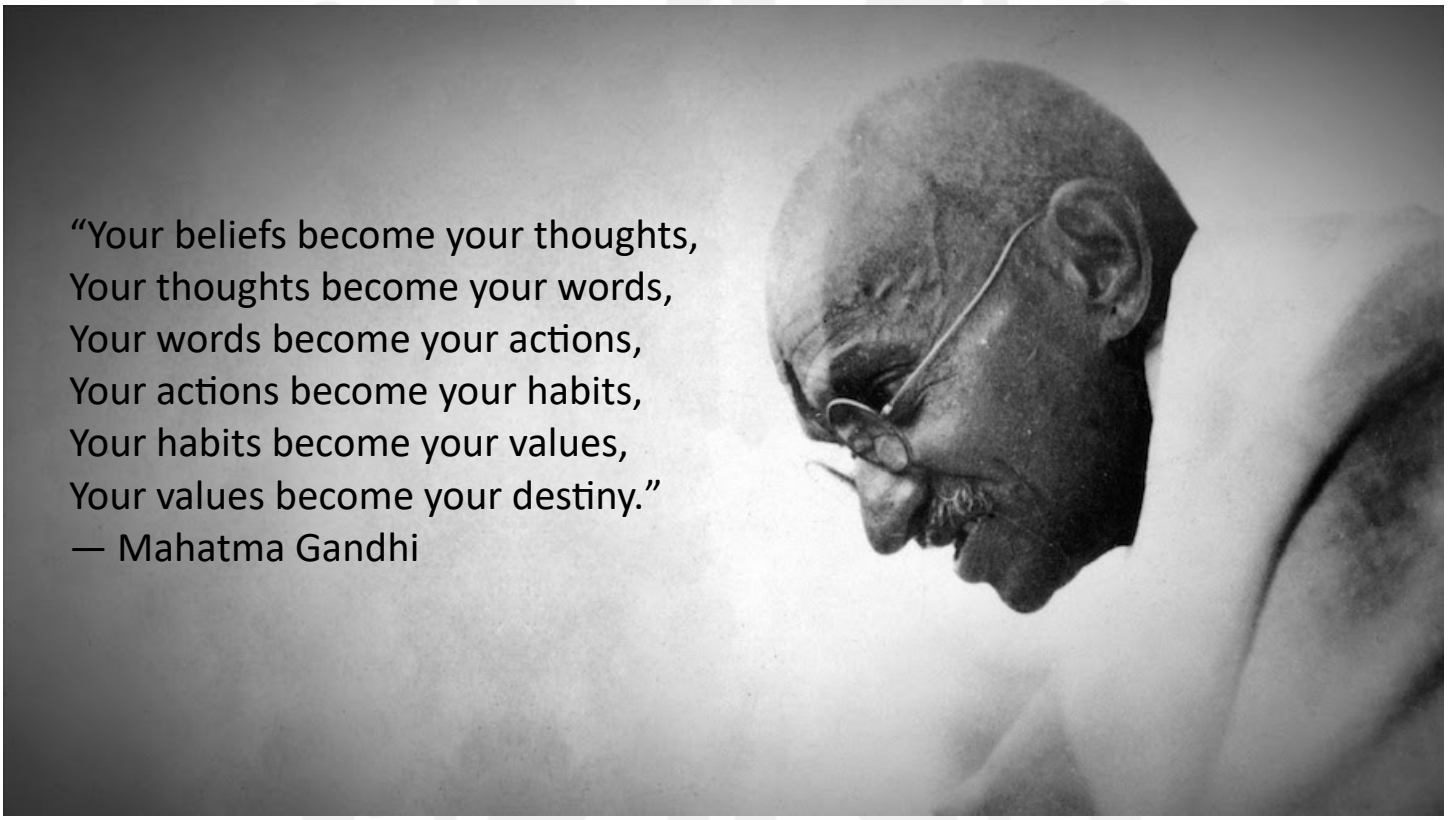

Polyvagal Theory: A *REALLY* Brief Summary*

Have you heard about Dr. Stephen Porges' Polyvagal Theory? The theory, already 20 years old, replaces our old notions of how the sympathetic (fight/flight) and parasympathetic nervous systems (rest and recuperation) help to keep us calm, alert and safe. The area covered by Polyvagal Theory is huge. It impacts the way we understand our nervous system, senses, emotions, social self and behaviors. We see diagnoses like autism, sensory modulation disorder, borderline personality and others, in a new light.

Polyvagal Theory claims that the nervous system employs a hierarchy of strategies to both regulate itself and to keep us safe in the face of danger. In fact, it's all about staying safe.

Our "highest" level strategy is a mechanism Porges calls social engagement. It is a phenomenal system - connecting the social muscles of the face (eyes, mouth and middle ear) with the heart. You knew that your heart came alive with social interaction, and it's true! This system is regulated through a myelinated branch of the vagus nerve. In evolutionary terms, this is our most evolved strategy (mammals only) for keeping ourselves safe. We use this all the time to clear up misunderstandings, get help, plead for forgiveness, and so on.

The next mechanism, or strategy, is fight or flight. It's regulated by the sympathetic nervous system. This system is our fall-back strategy when social engagement isn't a good fit. (Think of seeing someone sneaking up on you!) Note that freeze is not a part of fight or flight.

Our freeze option is primal and is a remnant of our reptilian past. Freeze is a great strategy for turtles and lizards, but it's usually a bad idea for humans - think of fainting. Therefore, we typically use it last, when social engagement and fight/flight aren't going to work for us. But there are good uses for freeze. During severe injury, it shuts us down and turns off our registration of pain. We also make use of it during sex, and it helps women regulate pain and response to pain during labor.

Now these systems appear to work in tandem. The social engagement system puts the brakes on the other (fight, flight, freeze) strategies, thus keeping our heart and body active while we work through a situation. The social engagement system will release the brakes to engage a different response to the environment (i.e. running) if engagement doesn't help to get us into a safe situation.

We want our nervous system to operate using the social exchange most of the time. It is our most evolved way of being. It is restful and healthy because it allows our gut and other organs to do their job uninterrupted.

However, some of us are programmed from an early age to work from a fight/flight mode. Think of people who are sensory sensitive and recoil from sound, touch, smell or taste. Think of people with autism (in this case, the face to heart connection is not working). Think of people with borderline personality, depression and perhaps other disorders, too. When we are not able to work from our social engagement strategy, then we revert to a modified fight/flight strategy, which puts us in high alert. If we use too much of the fight/flight or freeze strategies, we may end up with gut issues because the gut comes to a halt and we stop digesting food during fight/flight activation.

The Polyvagal Theory has gained great acceptance over the years as pieces of it are shown to hold under laboratory findings. From a psychological viewpoint, it provides us with a rich understanding of self-regulation in the body. From a sensory processing viewpoint, it informs our understanding of sensory modulation.

If you are unfamiliar with the topic, check out the many articles on Dr.Porges' website. The most comprehensive article is The Polyvagal Perspective, and it is published here on the NIH Public Access site. It contains the physiological underpinnings of the theory as well as perspectives on development, emotions, trauma and many other topics.

* Abridged from, Garland, Teresa, "Polyvagal Theory, Sensory Challenge and Gut Emotions", http://otselfregulation.blogspot.com (2012).

Human Memory - Part Three

LONG-TERM MEMORY

Long-term memory is, obviously enough, intended for storage of information over a long period of time. Despite our everyday impressions of forgetting, it seems likely that long-term memory actually decays very little over time, and can store a seemingly unlimited amount of information almost indefinitely. Indeed, there is some debate as to whether we actually ever "forget" anything at all, or whether it just becomes increasingly difficult to access or retrieve certain items from memory.

Short-term memories can become long-term memory through the process of consolidation, involving rehearsal and meaningful association. Unlike short-term memory (which relies mostly on an acoustic, and to a lesser extent a visual, code for storing information), long-term memory encodes information for storage semantically (i.e. based on meaning and association). However, there is also some evidence that long-term memory does also encode to some extent by sound. For example, when we cannot quite remember a word but it is "on the tip of the tongue", this is usually based on the sound of a word, not its meaning.

??? Did You Know ???

While older people have more difficulty than the young with rote memorization, such as remembering lists of words or numbers, they actually tend to perform better than young people in the recognition and recall of facts and tasks.

This is partly because older people, having accumulated more real-life experience and information, have a denser network of linkages and associations in their long-term memory, and partly because they have had time to more efficiently organize their facts and experiences in a more easily accessible hierarchical form.

Physiologically, the establishment of long-term memory involves a process of physical changes in the structure of neurons (or nerve cells) in the brain, a process known as long-term potentiation, although there is still much that is not completely understood about the process. At its simplest, whenever something is learned, circuits of neurons in the brain, known as neural networks, are created, altered or strengthened. These neural circuits are composed of a number of neurons that communicate with one another through special junctions called synapses. Through a process involving the creation of new proteins within the body of neurons, and the electrochemical transfer of neurotransmitters across synapse gaps to receptors, the communicative strength of certain circuits of neurons in the brain is reinforced. With repeated use, the efficiency of these synapse connections increases, facilitating the passage of nerve impulses along particular neural circuits, which may involve many connections to the visual cortex, the auditory cortex, the associative regions of the cortex, etc.

This process differs both structurally and functionally from the creation of working or short-term memory. Although the short-term memory is supported by transient patterns of neuronal communication in the regions of the frontal, prefrontal and parietal lobes of the brain, long-term memories are maintained by more stable and permanent changes in neural connections widely spread throughout the brain. The hippocampus area of the brain essentially acts as a kind of temporary transit point for long-term memories, and is not itself used to store information. However, it is essential to the consolidation of information from short-term to long-term memory, and is thought to be involved in changing neural connections for a period of three months or more after the initial learning.

??? Did You Know ???

Several studies have shown that both episodic and semantic long-term memories can be better recalled when the same language is used for both encoding and retrieval.

For example, bilingual Russian immigrants to the United States can recall more autobiographical details of their early life when the questions and cues are presented in Russian than when they are questioned in English.

Unlike with short-term memory, forgetting occurs in long-term memory when the formerly strengthened synaptic connections among the neurons in a neural network become weakened, or when the activation of a new network is superimposed over an older one, thus causing interference in the older memory.

Over the years, several different types of long-term memory have been distinguished, including explicit and implicit memory, declarative and procedural memory (with a further sub-division of declarative memory into episodic and semantic memory) and retrospective and prospective memory.

DECLARATIVE (EXPLICIT) & PROCEDURAL (IMPLICIT) MEMORY

Long-term memory is often divided into two further main types: explicit (or declarative) memory and implicit (or procedural) memory.

Declarative memory ("knowing what") is memory of facts and events, and refers to those memories that can be consciously recalled (or "declared"). It is sometimes called explicit memory, since it consists of information that is explicitly stored and retrieved, although it is more properly a subset of explicit memory. Declarative memory can be further sub-divided into episodic memory and semantic memory.

??? Did You Know ???

Studies have show that musicians tend to have a better memory than non-musicians, not just for music, but for words and pictures too.

Interestingly, they also tend to use different strategies for memorization, being more likely than non-musicians to group words into similar semantic categories, and less likely to verbalize pictures.

Procedural memory ("knowing how") is the unconscious memory of skills and how to do things, particularly the use of objects or movements of the body, such as tying a shoelace, playing a guitar or riding a bike. These memories are typically acquired through repetition and practice, and are composed of automatic sensorimotor behaviours that are so deeply embedded that we are no longer aware of them. Once learned, these "body memories" allow us to carry out ordinary motor actions more or less automatically. Procedural memory is sometimes referred to as implicit memory, because previous experiences aid in the performance of a task without explicit and conscious awareness of these previous experiences, although it is more properly a subset of implicit memory.

These different types of long-term memory are stored in different regions of the brain and undergo quite different processes. Declarative memories are encoded by the hippocampus, entorhinal cortex and perirhinal cortex (all within the medial temporal lobe of the brain), but are consolidated and stored in the temporal cortex and elsewhere. Procedural memories, on the other hand, do not appear to involve the hippocampus at all, and are encoded and stored by the cerebellum, putamen, caudate nucleus and the motor cortex, all of which are involved in motor control. Learned skills such as riding a bike are stored in the putamen; instinctive actions such as grooming are stored in the caudate nucleus; and the cerebellum is involved with timing and coordination of body skills. Thus, without the medial temporal lobe (the structure that includes the hippocampus), a person is still able to form new procedural memories (such as playing the piano, for example), but cannot remember the events during which they happened or were learned.

??? Did You Know ???

Brain-scan studies have shown that London taxi drivers, who spend years memorizing the city's labyrinthine streets, develop physically larger hippocampi, much as a muscle is enlarged by weight-training.

Perhaps the most famous study demonstrating the separation of the declarative and procedural memories is that of a patient known as "H.M.", who had parts of his medial temporal lobe, hippocampus and amygdala removed in 1953 in an attempt to cure his intractable epilepsy. After the surgery, H.M. could still form new procedural memories and short-term memories, but long-lasting declarative memories could no longer be formed. The nature of the exact brain surgery he underwent, and the types of amnesia he experienced, allowed a good understanding of how particular areas of the brain are linked to specific processes in memory formation. In particular, his ability to recall memories from well before his surgery, but his inability to create new long-term memories, suggests that encoding and retrieval of long-term memory information is mediated by distinct systems within the medial temporal lobe, particularly the hippocampus. The fact that he was able to learn hand-eye coordination skills such as mirror drawing, despite having absolutely no memory of having learned or practised the task before, also suggested the existence different types of long-term memory, which are now known as declarative and procedural memories

??? Did You Know ???

Children under the age of about seven pick up new languages easily without giving it much conscious thought, using procedural (or implicit) memory.

Adults, on the other hand, actively learn the rules and vocabulary of a new language using declarative (or explicit) memory.

There is strong evidence, notably by studying amnesic patients and the effect of priming, to suggest that implicit memory is largely distinct from explicit memory, and operates through a different process in the brain. Studies of the effects of amnesia have shown that it is quite possible to have an intact implicit memory despite a severely impaired explicit memory. Priming is the effect in which exposure to a stimulus influences response to a subsequent stimulus, so that, for instance, if a person reads a list of words including the word "concert", and is later asked to complete a word starting with "con", there is a higher probability that they will answer "concert" than, say, "contact", "connect", etc. Studies from amnesic patients indicate that priming is controlled by a

brain system separate from the medial temporal system that supports explicit memory.

EPISODIC & SEMANTIC MEMORY

Declarative memory can be further sub-divided into episodic memory and semantic memory.

Episodic memory represents our memory of experiences and specific events in time in a serial form, from which we can reconstruct the actual events that took place at any given point in our lives. It is the memory of autobiographical events (times, places, associated emotions and other contextual knowledge) that can be explicitly stated. Individuals tend to see themselves as actors in these events, and the emotional charge and the entire context surrounding an event is usually part of the memory, not just the bare facts of the event itself.

??? Did You Know ???

Females consistently perform better than males on episodic long-term memory tasks, especially those involving delayed recall and recognition.

However, males and females do not differ significantly on working memory and semantic memory tasks.

There is also evidence for a negative recall bias in women, which means that females in general are more likely than males to recall their mistakes.

Semantic memory, on the other hand, is a more structured record of facts, meanings, concepts and knowledge about the external world that we have acquired. It refers to general factual knowledge, shared with others and independent of personal experience and of the spatial/temporal context in which it was acquired. Semantic memories may once have had a personal context, but now stand alone as simple knowledge. It therefore includes such things as types of food, capital cities, social customs, functions of objects, vocabulary, understanding of mathematics, etc. Much of semantic memory is abstract and relational and is associated with the meaning of verbal symbols.

The semantic memory is generally derived from the episodic memory, in that we learn new facts or concepts from our experiences, and the episodic memory is considered to support and underpin semantic memory. A gradual transition from episodic to semantic memory can take place, in which episodic memory reduces its sensitivity and association to particular events, so that the information can be generalized as semantic memory.

??? Did You Know???

Experiments on rats in the 1970s showed that there are over a million "place cells" in a rat's hippocampus, each of which only becomes active when the rat is located in a very specific part of its environment.

All together they can form a very precise cognitive map that tells the animal where it is at any given time.

Both episodic memory and semantic memory require a similar encoding process. However, semantic memory mainly activates the frontal and temporal cortexes, whereas episodic memory activity is concentrated in the hippocampus, at least initially. Once processed in the hippocampus, episodic memories are then consolidated and stored in the neocortex. The memories of the different elements of a particular event are distributed in the various visual, olfactory and auditory areas of the brain, but they are all connected together by the hippocampus to form an episode, rather than remaining a collection of separate memories.

For example, memories of people's faces, the taste of the wine, the music that was playing, etc, might all be part of the memory of a particular dinner with friends. By repeatedly reactivating or "playing back" this particular activity pattern in the various regions of the cortex, they become so strongly linked with one another that they no longer need the hippocampus to act as their link, and the memory of the music that was playing that night, for example, can act as an index entry, and may be enough to bring back the entire scene of the dinner party.

??? Did You Know???

Recent research into links between memory and handedness suggest that "mixed-handers" (who typically perform some tasks with one hand and some with the other) tend to show better autobiographcial memory than "strong-handers" (who perform almost all tasks with either one hand or the other).

It is hypothesized that mixed-handers may have more, or better, communication between the brain's hemispheres than strong-handers, and possibly even a thicker corpus callosum.

Our spatial memory in particular appears to be much more confined to the hippocampus, particularly the right hippocampus, which seems to be able to create a mental map of space, thanks to certain cells called "place cells". Episodic memory does also trigger activity in the temporal lobe, but mainly in order to ensure that these personal memories are not mistaken for real life. This difference in the neurological processing of episodic and semantic memory is illustrated by cases of anterograde amnesia cases (a good example being a case known as "C.L.") in which episodic memory is almost completely lost while semantic memory is retained.

A further category of declarative memory, referred to as autobiographical memory, is sometimes distinguished, although really it is just one area of episodic memory. Autobiographical memory refers to a memory system consisting of episodes recollected from an individual's own life, often based on a combination of episodic memory (personal experiences and specific objects, people and events experienced at particular times and places) and semantic memory (general knowledge and facts about the world).

One specific type of autobiographical memory is known as a "flashbulb memory", a highly detailed, exceptionally vivid "snapshot" of a moment or circumstances in which surprising and consequential (or emotionally arousing) news was heard, famous examples being the assassination of John Kennedy, the terrorist bombings on 9/11, etc. Such memories are believed by some to be highly resistant to forgetting, possibly due to the strong emotions that are typically associated with them. However, a number of studies also suggest that flashbulb memories are actually not especially accurate, despite apparently being experienced with great vividness and confidence.

RETROSPECTIVE & PROSPECTIVE MEMORY

An important alternative classification of long-term memory used by some researchers is based on the temporal direction of the memories.

Retrospective memory is where the content to be remembered (people, words, events, etc) is in the past, i.e. the recollection of past episodes. It includes semantic, episodic and autobiographical memory, and declarative memory in general, although it can be either explicit or implicit.

Prospective memory is where the content is to be remembered in the future, and may be defined as "remembering to remember" or remembering to perform an intended action. It may be either event-based or time-based, often triggered by a cue, such as going to the doctor (action) at 4pm (cue), or remembering to post a letter (action) after seeing a mailbox (cue).

Clearly, though, retrospective and prospective memory are not entirely independent entities, and certain aspects of retrospective memory are usually required for prospective memory. Thus, there have been case studies where an impaired retrospective memory has caused a definite impact on prospective memory. However, there have also been studies where patients with an impaired prospective memory had an intact retrospective memory, suggesting that to some extent the two types of memory involve separate processes.

??? Did You Know???

MRI studies have shown that the same parts of the brain are used when remembering the past as when imagining a similar event in the future, which shows that past memories are also accessed and drawn on when projections are made into the future.

This is sometimes referred to as "mental time travel" as it allows us to project ourselves at will either backwards or forwards in time within our personal lives.

HUMOR

Grammar Lesson

On his 68th birthday, a man was given a gift certificate from his wife. The certificate was for consultation with the Cherokee Indian medicine man living on a nearby reservation who was rumored to have a simple cure for erectile dysfunction.

The husband went to the reservation and saw the medicine man. The old Indian gave him a potion and with a grip on his shoulder warned, "This is a powerful medicine. You take only a teaspoonful, and then say, "1-2-3. When you do, you will become manlier than you have ever been in your life, and you can perform for as long as you want."

The man thanked the old Indian and as he walked away, he turned and asked, "How do I stop the medicine from working?"

"Your partner must say 1-2-3-4," he responded, "but when she does, the medicine will not work again until the next full moon."

He was very eager to see if it worked so he went home, showered, shaved, took a spoonful of the medicine, and then invited his wife to join him in the bedroom. When she came in, he took off his clothes and said, "1-2-3!"

Immediately, he was the manliest of men.

His wife was excited and began throwing off her clothes, and asked, "What was the 1-2-3 for?"

And that, boys and girls is why we should never end our sentences with a preposition, because we could end up with a dangling participle.

What Happens When the Fight/Flight Response Fails

Consider this short example.

On CNN they showed an airplane having great difficulty landing. The wings were tipping back and forth and the outcome was uncertain.

After it landed, a reporter interviewed the passengers, going up to one woman and asking, "How did you feel?" The expectation was that the woman would say, "I was really scared. I was ready to jump out of my skin." But her comment wasn't that.

''The same scary event can be translated by different nervous systems in different ways.''

She said, "Feel? I passed out."

Now, was the woman's passing out a voluntary escape? No, her nervous system detected features of risk.

You see, our neuroception - our nervous system's evaluation of risk - is functionally unpredictable (and it happens without our awareness). We don't know how our nervous system will respond.

If that plane hit the ground and went up into flames, her transition from life to death would have been without pain. However, many of the people in exactly the same environment were screaming, while there were probably others who were relatively calm.

So here we have an example of the same scary event being translated by different nervous systems in different ways.

Why Does the Response of the Nervous System Matter?

Well first, let's back up and review the development of the vagus nerve.

Early in vertebrate evolution, neural regulation of the heart was mediated by an unmyelinated, less-than-efficient vagus. This neural system provided an ability to defend by immobilizing, which meant reducing metabolic demands, reducing oxygen demands, reducing food demands, and surviving.

As mammals evolved, something special happened to the vagus. The evolved vagus was able to dampen the sympathetic nervous system and the adrenal circuits to enable mammals to engage socially, and to optimize metabolic resources.

This is one of the main points of the Polyvagal Theory - when we are social and engaged, we're reducing metabolic demands in order to facilitate health, growth, and restoration.

What Happens to the Nervous System When a Person Has Trauma?

If you are confronted with a challenge:

1. The first part of your nervous system will try to negotiate by using the face, using vocalization, using language.
2. If that doesn't work, there's going to be a retraction of the new social engagement system to promote mobilization.
3. If that doesn't work, then you're really going to gear up the sympathetic nervous system for fight-flight.

''If you can't escape, and you can't fight, increasing sympathetic nervous system activity is not adaptive . . .''

But if you can't escape, and you can't fight, increasing sympathetic nervous system activity is not adaptive since mobilizing will not be an effective defense.

''If you can't escape, and you can't fight, increasing sympathetic nervous system activity is not adaptive . . .''

Under these circumstances the nervous system seems to evaluate the risk of threat and will trigger a shutdown response. This is similar to the scenarios described by people with trauma histories, especially small children, or people

confronted by larger and stronger people, or experiences in an environment where someone has a weapon.

The problem is that when we start dealing with trauma, the clinical world is obsessed with the event and not with understanding that a person's response to the event is the critical feature.

''The problem is that when we start dealing with trauma, the clinical world is obsessed with the event.''

Here's What's Important . . .

If people go into a state of immobilization with fear, the nervous system doesn't provide them with an easy way to get out, meaning getting back to a normal system where social engagement processes are easily recruited.

For most people, the trauma experience results in the development of a complex narrative of why they don't want to socially interact: they don't trust people…basically they have visceral physiological feelings.

''How do you recruit the social engagement system to move out of the dangerous immobilization state?''

They're exhausted, their nervous system is detecting risk when there is no real risk, and they are trying to negotiate this very complex world. The narrative they're building is an attempt to support the physiological experience.

But, the real question is how to get a person out of that state? How do you recruit the wonderful social engagement system to inhibit the sympathetic mobilization and to move out of the dangerous immobilization state? This is where some ideas from the Polyvagal Theory are slowly creeping into the clinical world.

''The first thing that the client needs to do in any environment is to navigate in space to ensure safety.''

The First Thing That the Client Needs to Do in Any Environment

The first thing that the client needs to do in any environment is to navigate in space to ensure safety. Pat Ogden is truly a master in understanding this feature. In her clinical settings, she empowers the client to move and even position the therapist to ensure that the client experiences a sense of safety.

Often feeling safe has a lot to do with the proximity to the therapist. In a sense, the therapist, as another human being, is dangerous to a client who has been traumatized. To reduce these features of danger, Pat empowers the client to navigate in the space of her office to feel safe.

How to Re-enlist the Social Engagement System to Quicken Healing

''Once there is a feeling of safety, there's a shift in physiological state.''

Once there is a feeling of safety, there's a shift in physiological state. When there is that shift in physiological state, then spontaneous engagement behaviors occur: the tone of the voice changes and facial expression changes.

Now if the therapist is reciprocal and responds with engagement behaviors characterized by prosodic voice and positive facial affect, the social engagement system of the client is stimulated.

Based on the Polyvagal Theory, Here Are Two Hints for Clinicians

One, negotiate safety, and two, understand that our nervous system responds to the features of others differently in safe environments than in dangerous situations or even in noisy places.

Because noisy, low frequency sounds can trigger our nervous system to think that a predator might be nearby, the first thing we should do to a clinical setting is make it quiet. Get rid of the low frequency sounds.

Once our nervous system feels safer, then the therapeutic strategy is to trigger the neural regulation of the social engagement system

How would we do that? This is where listening to vocal music, the prosodic features of sound even without another person, can have the effect of making us feel safer.

''Once our nervous system feels safer, then the therapeutic strategy is to trigger the neural regulation of the social engagement system.''

Polyvagal Theory in Practice

By Dee Wagner, *June 27, 2016*

Picturing brain chemistry can be something like picturing a hurricane. Although we can imagine bad weather, it is difficult to imagine changing that weather. But Stephen Porges' polyvagal theory gives counselors a useful picture of the nervous system that can guide us in our efforts to help clients.

Porges' polyvagal theory developed out of his experiments with the vagus nerve. The vagus nerve serves the parasympathetic nervous system, which is the calming aspect of our nervous system mechanics. The parasympathetic part of the autonomic nervous system balances the sympathetic active part, but in much more nuanced ways than we understood before polyvagal theory.

Our three-part nervous system

Before polyvagal theory, our nervous system was pictured as a two-part antagonistic system, with more activation signaling less calming and more calming signaling less activation. Polyvagal theory identifies a third type of nervous system response that Porges calls the social engagement system, a playful mixture of activation and calming that operates out of unique nerve influence.

The social engagement system helps us navigate relationships. Helping our clients shift into use of their social engagement system allows them to become more flexible in their coping styles.

The two other parts of our nervous system function to help us manage life-threatening situations. Most counselors are already familiar with the two defense mechanisms triggered by these two parts of the nervous system: sympathetic fight-or-flight and parasympathetic shutdown, sometimes called freeze-or-faint. Use of our social engagement system, on the other hand, requires a sense of safety.

Polyvagal theory helps us understand that both branches of the vagus nerve calm the body, but they do so in different ways. Shutdown, or freeze-or-faint, occurs through the dorsal branch of the vagus nerve. This reaction can feel like the fatigued muscles and lightheadedness of a bad flu. When the dorsal vagal nerve shuts down the body, it can move us into immobility or dissociation. In addition to affecting the heart and lungs, the dorsal branch affects body functioning below the diaphragm and is involved in digestive issues.

The ventral branch of the vagal nerve affects body functioning above the diaphragm. This is the branch that serves the social engagement system. The ventral vagal nerve dampens the body's regularly active state. Picture controlling a horse as you ride it back to the stable. You would continue to pull back on and release the reins in nuanced ways to ensure that the horse maintains an appropriate speed. Likewise, the ventral vagal nerve allows activation in a nuanced way, thus offering a different quality than sympathetic activation.

Ventral vagal release into activity takes milliseconds, whereas sympathetic activation takes seconds and involves various chemical reactions that are akin to losing the horse's reins. In addition, once the fight-or-flight chemical reactions have begun, it can take our bodies 10–20 minutes to return to our pre-fight/pre-flight state. Ventral vagal release into activity does not involve these sorts of chemical reactions. Therefore, we can make quicker adjustments between activation and calming, similar to what we can do when we use the reins to control the horse.

If you go to a dog park, you will see certain dogs that are afraid. They exhibit fight-or-flight behaviors. Other dogs will signal a wish to play. This signaling often takes the form that we humans hijacked for the downward-facing-dog pose in yoga. When a dog gives this signal, it cues a level of arousal that can be intense. However, this playful energy has a very different spirit than the intensity of fight-or-flight behaviors. This playful spirit characterizes the social engagement system. When we experience our environment as safe, we operate from our social engagement system.

Trauma's effect on nervous system response

If we have unresolved trauma in our past, we may live in a version of perpetual fight-or-flight. We may be able to channel this fight-or-flight anxiety into activities such as cleaning the house, raking the leaves or working out at the gym, but these activities will have a different feel than they would if they were done with social engagement biology (think "Whistle While You Work").

For some trauma survivors, no activity successfully channels their fight-or-flight sensations. As a result, they feel trapped and their bodies shut down. These clients may live in a version of perpetual shutdown.

Peter Levine, a longtime friend and colleague of Porges, has studied the shutdown response through animal observations and bodywork with clients. In Waking the Tiger: Healing Trauma, he explains that emerging from shutdown requires a shudder or shake to discharge suspended fight-or-flight energy. In a life-threatening situation, if we have shutdown and an opportunity for active survival presents itself, we can wake ourselves up. As counselors, we might recognize this shift from shutdown to fight-or-flight in a client's move from depression into anxiety.

But how can we help our clients move into their social engagement biology? If clients live in a more dissociative, depressed, shutdown manner, we must help them shift temporarily into fight-or-flight. As clients experience fight-or-flight intensity, we must then help them find a sense of safety. When they can sense that they are safe, they can shift into their social engagement system.

The body-awareness techniques that are part of cognitive behavior therapy (CBT) and dialectical behavior therapy (DBT) can help clients move out of dissociative, shutdown responses by encouraging them to become more embodied. When clients are more present in their bodies and better able to attend to momentary muscular tension, they can wake up from a shutdown response. As clients activate out of shutdown and shift toward fight-or-flight sensations, the thought-restructuring techniques that are also part of CBT and DBT can teach clients to evaluate their safety more accurately. Reflective listening techniques can help clients feel a connection with their counselors. This makes it possible for these clients to feel safe enough to shift into social engagement biology.

Specific aspects of ventral vagal nerve functioning

Porges chose the name social engagement system because the ventral vagal nerve affects the middle ear, which filters out background noises to make it easier to hear the human voice. It also affects facial muscles and thus the ability to make communicative facial expressions. Finally, it affects the larynx and thus vocal tone and vocal patterning, helping humans create sounds that soothe one another.

Since publishing The Polyvagal Theory: Neurophysiological Foundations of Emotions, Attachment, Communication and Self-Regulation in 2011, Porges has studied the use of sound modulation to hierarchy train mid-

dle-ear muscles. Clients with poor social engagement system functioning may have inner ear difficulties that make it hard for them to receive soothing from others' voices. As counselors, we can be conscious of our vocal patterns and facial expressions and curious about the effects those aspects of our communication have on our clients.

Based on his understanding of the effects of the vagus nerve, Porges notes that extending exhales longer than inhales for a period of time activates the parasympathetic nervous system. Porges was a clarinet player in his youth and remembers the effect of the breath patterns required to play that instrument.

As a dance therapist, I am aware that extending exhales helps clients who are stuck in forms of fight-or-flight response to move into a sense of safety. For clients stuck in some form of shutdown, I have found that conscious breath work can stir the fight-or-flight response. When this occurs, the fight-or-flight energy needs to be discharged through movement for clients to find a sense of safety. For instance, these clients might need to run in place or punch a pillow. The hierarchy of defense system functioning explains these therapeutic techniques.

Respiratory sinus arrhythmia is a good index of ventral vagal functioning. This means we now have methods to study the effectiveness of body therapies and expressive arts therapies.

Polyvagal Theory in My Practice

What follows is an example of how I used polyvagal theory with a client who experienced medical trauma during her birth.

The client, whom I have been seeing for some time, described feeling very sleepy and acknowledged having difficulty getting to our session on this day. Her psychiatrist had prescribed her Zoloft as a way of treating anxiety stirred by the birth of her daughter's first child. The client and I had previously normalized her anxiety as a trauma response.

During the years before coming to see me, this client had attempted suicide, which resulted in medical procedures that added to her trauma. Through our work, she has come to understand that the panic attacks she has when in contained situations are also trauma responses. She has lived much of her life in perpetual fight-or-flight response mode.

On this day, she was relieved to be less emotional, but she feared the tiredness that accompanied Zoloft's help in calming her fight-or-flight sensations. I saw this fear of the tiredness as a fear of dorsal vagal shutdown. We discussed the possibility that this tiredness could allow her a new kind of activation. I asked if she would like to do some expressive art that would allow gentle, expressive movement. She shuddered, naming her preference for things that were less subjective.

We talked about the existence of a kind of aliveness that still feels safe. We talked about the possibility of existing in a playful place in which there is no right and wrong, only preference. We acknowledged that since her birth, she and her parents had feared that her health would fail again. This environment in which she had grown up had supported nervous system functioning designed for life-threatening situations. With the Zoloft calming her fight-or-flight activation, I suggested that perhaps she could explore some calmer, more playful kinds of subjective experiences.

"It feels like you are trying to create a different me," she responded. I acknowledged that it might sound as if I were thinking she could be someone she wasn't. But I explained that what I was actually suggesting was the possibility that she could be herself in a different way.

The client told me she had a new book on grandparenting that contained a chapter on play. She said she would consider reading it. At the same time, she said that she might not be able to tolerate the Zoloft and might have to get off of it. Regardless, the idea of this different, more playful way of being has been introduced to her and, for a moment or two, experienced.

GETTING THE PICTURE

As counselors armed with polyvagal theory, we can picture defense mechanism hierarchy. We can recognize shifts from fight-or-flight to shutdown when clients feel trapped. We can also recognize the movement from shutdown into fight-or-flight that offers a possible shift into social engagement biology if and when the client can gain a sense of safety.

Before polyvagal theory, most counselors could probably recognize fight-or-flight and shutdown behaviors. They could probably sense a difference between defense responses designed for life-threatening situations and responses that characterize what Porges calls the social engagement system. Polyvagal theory deepens that awareness with the knowledge that playful arousal and restorative surrender have a unique nervous system influence.

Most counselors appreciate brain science but may find it difficult to picture how to use the information. Thanks to polyvagal theory's clarification of the role of the ventral branch of the vagus nerve, we now have a map to guide us.

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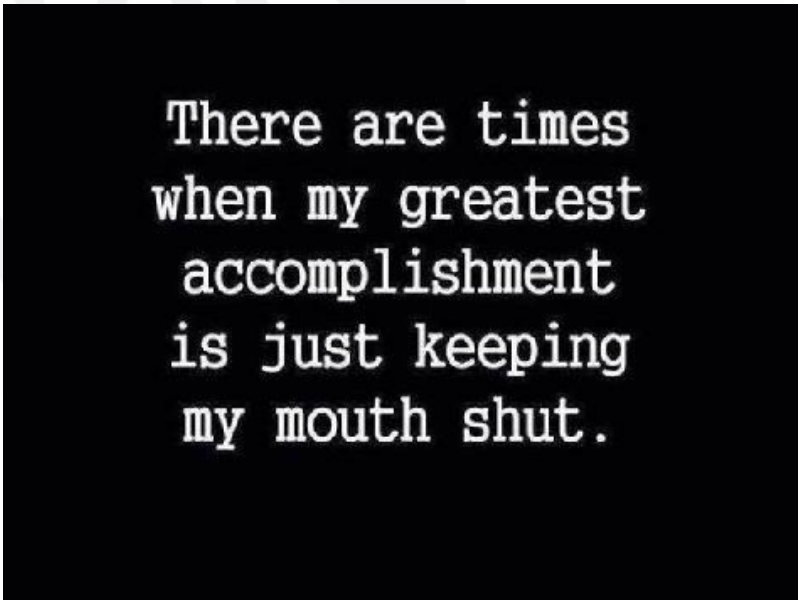

Professional Development / InService	
Leamington 1st and 3rd Wednesday	Parkhill 2nd and 4th Wednesday
Sept 19	Sept 26
Oct 3	Oct 10
Oct 17	Oct 24
Nov 7	Nov 14
Nov 21	Nov 28
Dec 5 (Christmas Luncheon— tentatively)	Dec 12 (Christmas Luncheon— tentatively)
2019	
Jan 16	Jan 9
Feb 6	Jan 23
Feb 20	Feb 13
March 6	Feb 27
March 20	March 13 (March Break)
April 3	March 27
April 17	April 10
May 2	April 24
May 15	May 8
June 5	May 22
	June 12

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