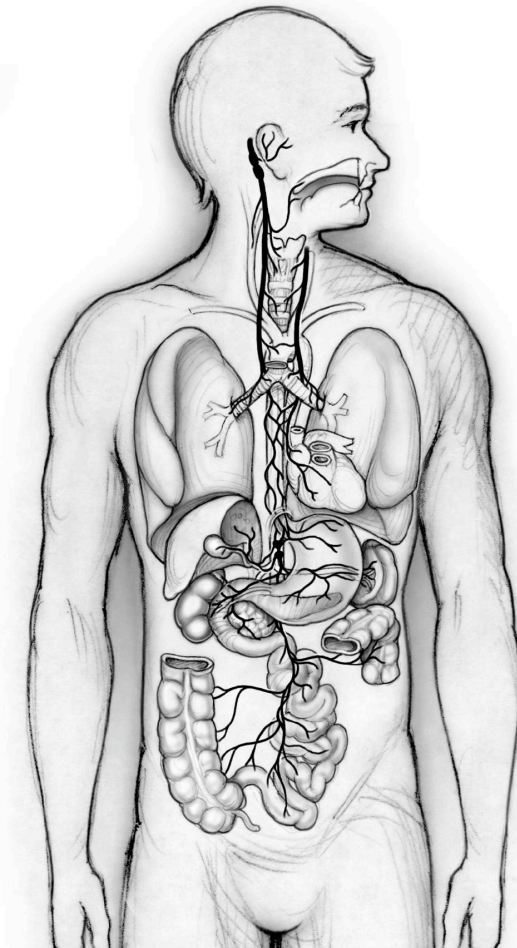


The Vagus Nerve in Body Psychotherapy with Early Developmental Dilemmas:

Intervention with Hands-on Energetic Work



Jim Kepner PhD
3372 Clayton Blvd.
Shaker Hts., OH 44120
[**jimkepner@aol.com**](mailto:jimkepner@aol.com)
[**www.pathwaysforhealing.com**](http://www.pathwaysforhealing.com)
440-473-8973

Title: The vagus nerve in body psychotherapy with early developmental dilemmas: intervention via hands-on energetic work.

James Kepner Ph.D.

Introduction-

This paper takes an integral view attempting to show how the neuroscience of the autonomic nervous system, developmental psychology, the phenomenology of embodied self-experience, and body-oriented psychotherapy intervention may be brought together for more direct impact on clinical issues rooted in relational compromises in early development.

Of particular interest is the work of Stephen Porges on the vagus nerve in emotional and psycho-social development (Porges 1995, 1997a) and the implications of his Polyvagal Theory of Emotion for the psychotherapy of the dilemmas of early development (Porges 1997b, 2003 in press). Porges theory outlines how the vagus nerve, an autonomic nerve, is integrated into functioning which effects emotion, relationship and attention.

In this paper I will draw connections between these neuropsychological observations and clinical concerns having to do with dilemmas of early development, especially problems in relational connection, attachment, and sense of self (internal subjective self-experience). I hope to show that the vagus nerve effects not only our *functional* capacity, such as self-regulation of arousal, self-soothing, gaze and relational contact, social-positive emotional expression and so on, but also contributes to the *quality of subjective* bodily experience and internal sensation which underlie ones sense of self.

Further, I would like to show how body-oriented psychotherapy (Kepner 1987) intervention using energetic work in the vagus nerve system supports psychotherapy work on these early developmental issues by effecting *both* subjective experience (by influencing the energetic-physiological substrata for experience) *and* may also change physiological functioning of the autonomic nervous system. Our clinical experience is that this kind of integrated body psychotherapy and energetic work can help to broaden the client's capacity for emotional experience and help give access to a range of therapeutic factors: to make more accessible important felt-qualities of self otherwise unavailable to experience; and to increase the capacity for self regulation so important in human contact and relationship. The latter includes the sympathetic/parasympathetic balance needed to access to self-calm and self-soothing, and support for the underlying pro-social vagal state which supports intimacy and contact.

The Vagus Nerve- anatomy and function

The vagus nerve, also called the 10th cranial nerve, is considered the longest single nerve in the body. It's name is derived from the Latin for "wanderer" because of it's meandering appearance. The vagus nerve originates in nuclei in the brain stem. It then exits through cranial openings with branches to eyelids, inner ear, mouth and throat and continues it's descent down the neck and into the chest with branches to the heart and

lungs. Continuing down the body interior, it appears to be knitted around the esophagus, then below the diaphragm it branches to the stomach, spleen, pancreas, kidneys, and liver; and finally ending in a flurry of branches into the large and small intestines where it enervates as far inferior as the level of the appendix. Quite a wandering path!

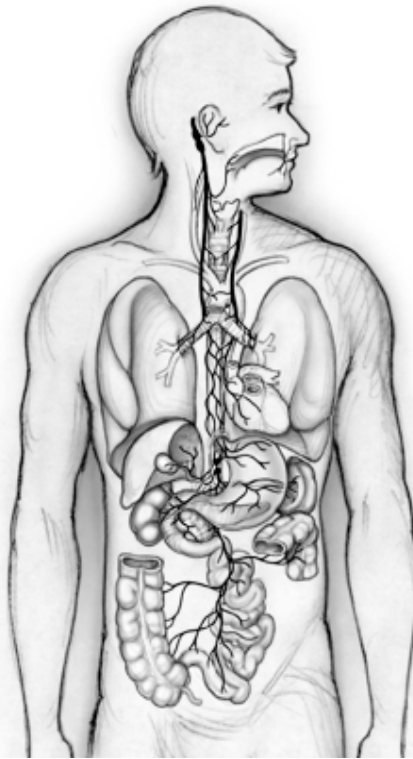


Figure 1 Vagus Nerve in situ.

Drawing by Joseph Kanasz, © 2003 James Kepner

The vagus nerve is a *parasympathetic* nerve. The autonomic nervous system is functionally and anatomically divided into two systems: the *sympathetic nervous system*, which is responsible for the high-energy output emergency responses of the fight-or-flight reactions; and the *parasympathetic nervous system* which is responsible for energy conserving and replenishment responses such as slowing of heart rate and respiration, increase of digestive secretions and peristalsis, the relaxation of blood vessels in the body core organs, and so on. The parasympathetic system is slower to respond than the sympathetic “emergency” system and when it is activated is both subjectively and objectively associated with

slowing down, calm, being settled and at ease. Recall what you feel like when you are digesting a good meal and enjoying good company.

These two autonomic systems tend to counter and to balance each other. As the biological priority of survival in fight or flight (sympathetic nervous system activation) takes precedence over digestion (parasympathetic nervous system activation). So, when we perceive an emergency condition, the sympathetic nervous system is fired up (adrenalin secretion, increased heart rate and respiration, peripheral vasodilatation of muscle blood supply, etc.) and the parasympathetic nervous system, and thus vagal system, is suppressed. Under chronic stress, the continual level of *sympathetic nervous system* activation suppresses *parasympathetic tone* so that the functions of the parasympathetic nervous system are diminished and interfered with. Thus the vagus nerve and lack of what has been called “vagal tone” is implicated in stress. Many stress related health problems, such as heart problems, digestive disturbance, irritable bowel and others, are thought to be effected by an imbalance or dysregulation between the sympathetic nervous system and parasympathetic nervous system.

Psychosocial aspects of vagus nerve and it's development- The Polyvagal theory of emotion

When I was pursuing my degrees in psychology twenty five years ago, in what my children refer to as “the old days,” we were taught the autonomic nervous system was of interest to psychology only as a physiological indicator of stress or emotional responses. In this view the autonomic nervous system had little directly to do with anything of interest to a psychotherapist, since it was thought to be both inaccessible to conscious control and unavailable to any sensory perception other than gross visceral pain. Since there was nothing you could actually do to alter these physiological responses by *talking* to a person in this now outdated view, the autonomic nervous system was seen to be of clinical interest only in research as a broad indicator of possible emotional response.

Twenty ensuing years of research in neuropsychology has given us a very different appreciation of the role of the autonomic nervous system in human functioning and experience. Stephen Porges research on the vagus nerve (Porges 1995, 1997b, 1998, in press, Porges & Doussard-Roosevelt 1997) is of particular relevance here. Porges, drawing on his own and others research into the autonomic nervous system, has painstakingly made important connections between vagal nerve functioning, early development, emotions, and the psychosocial underpinnings of learning and attention.

The results of his research, expressed in his Polyvagal Theory of Emotion, give us a framework for understanding that the autonomic nervous system is not just a raw reflector of physiological function and emotional arousal. It's functioning is interwoven into higher level social, relational, learning and self-regulatory processes. It's regulatory capacity is fundamentally keyed to the *relational* domain, not just the digestive. This regulatory capacity is both formed *in* and also *shapes* the quality of the infant-mother relationship. In turn, vagal tone and regulatory capacity, or it's lack, then shapes the quality of many forms of social interaction in life such as learning and attention, friendships and love relationship.

I will present here a very condensed and schematic version of Porges Polyvagal Theory geared to the purposes of the present paper. I will then connect this understanding of the psychosocial functions of the vagus nerve with problems which appear in the adult psychotherapy setting that are related to early development in the bonding/attachment/feeding process. I would then like to introduce some observations derived from clinical experience in working with the vagus nerve, how it contributes to our visceral-somatic sense of self (subjective self-experience) and then relate this to the developmental concerns of therapy. Finally, I will describe, through a case presentation, the use of certain body-oriented interventions which appear to directly effect vagal functioning and experience and how this form of intervention can contribute to resolution of psychotherapeutic issues.

Polyvagal theory- Porges

Porges notes that, because of the way the nervous system in mammals has evolved, there is not one undifferentiated vagal system but a complex of differentiated brain stem nuclei, together with complex somatosensory connections. Hence his term *Polyvagal*.

Reptiles have only the dorsal motor nucleus of *dorsal vagal complex* (DVC) originating in the brain stem. It is unmyelinated and thus both slower to respond than myelinated nerve tissue, and also has less capacity to be modulated in it's signaling.

When stimulated the DVC brings about a distinct brake (slow down) on heart rate and a markedly lowered metabolism. In reptiles, this primitive vagus system is only stimulated when in rest (think of a snake in half-asleep with torpor as it digests it's meal) or in a kind of shut down "diving response" survival strategy during emergencies. Reptiles are essentially "underpowered" and can't afford to have any vagal brake on metabolism during muscular activity or engagement in the environment or they would be stopped in their tracks (Porges 1995). Reptiles have two basic survival strategies available: either release of vagal brake and full fight or flight (sympathetic nervous system activation), or full vagal brake and complete shut-down.

Mammals, including humans, have this system also, but it is overlaid and integrated into a set of vagal responses rooted in the *ventral vagal complex* of the brain stem (VVC). Nerve fibers from the VVC are myelinated and thus relatively quicker in action. Myelination also allows for a more differentiated response. The VVC not only effects heart rate in a more graded way than the DVC, it also acts with and effects muscles of the face, mouth, ears, and neck which are part of orienting and emotional expression because nerves enervating these muscles also communicate through this nucleus (Porges 1995, 1997). Mammals have available many more options in responding to survival demands, than fight/flight or shut-down. These include such things as sustained attention to facilitate information gathering and processing, as well as facial expressions and vocalizations to express and communicate in the social group. The action of the VVC is implicated in supporting and modulating the kind of sustained attention necessary in mammals to coordinate more complex adaptive strategies, and also in other kinds of social engagement and learning.

"The Theory proposes that the evolution of the mammalian autonomic nervous system, and specifically the brainstem autoregulatory centers of the vagus and other related cranial nerves, provides substrates for emotional experiences and affective processes that are necessary for social behavior in mammals. In this context, the evolution of the nervous system limits or expands the ability to express emotions, which in turn may determine proximity, social contact, and the quality of communication." (Paper to be published in C. S. Carter, B. Kirkpatrick, & I.I. Lederhendler (eds.), *The Integrative Neurobiology of Affiliation*, Annals of the New York Academy of Sciences. *Emotion: An Evolutionary By-Product of the Neural Regulation of the Autonomic Nervous System* Stephen W. Porges Institute for Child Study University of Maryland College Park, Maryland 20742-1131)

Psycho-emotional states associated with feeding: Social Engagement, Attachment and Vagal Tone

Our clinical work over the last couple of years supports the importance of the vagus nerve to attachment related therapeutic issues. The relevance of this neuropsychological view to the psychological and relational world of an adult becomes clear as we begin to

see vagal function and activity as it is intrinsically intertwined in the natural world of the infant and child.¹ Imagine the following scenario:

Primal Vagal-Feeding Paradigm

You hold a hungry infant who is arching and crying with discomfort. Her cries agitate you, sending your heart-rate up as you quickly bring out the milk, snuggling the infant into the crook of your arm, and put the milk-drop laden nipple to the her rosebud mouth. The infant clamps down almost desperately on the nipple, suckling strongly and vocalizing through her closed mouth with little wheepling sounds as she feeds, her eyes closed, all her focus on this act of virtually inhaling what her little body calls for so needfully. You respond to her needy hunger and to her sounds, talking to her in sing-song and with cooing words, “That’s it,” and “ You’re so hungry, aren’t you baby?” and other blandishments.

As you watch her throat pulse from swallowing, both of you begin to relax down together into the rocking chair, and settle into the rhythm of feeding. More relaxed not, her eyes open and you gaze at each other, cooing and talking in to her in gentle tones. Even while she feeds, she responds with sounds of her own and facial expressions, matching the tone and rhythm of your sounds, venturing sounds of her own to get you to match hers.

As her belly fills, swelling under your cradling hand, she occasionally pops the nipple out of her mouth, vocalizing back her wonderful baby-words, smiling and laughing at your facial expressions, then returning at intervals to her intent sucking and feeding.

As feeding proceeds and her belly swells with fullness, her body relaxes more and more. Her eyes look heavier and heavier, closing increasingly from time to time. Along with her, you also are settling into kind of a warm haze, your body heavier and more relaxed into the chair. The warmth of her little bundled body where she rests against you to melts into you so that you are both one warm body. Your own breathing slows, your heart rate slows too. You also feel quiet and filled up inside, in some tangible yet difficult to define way, as if you too had fed.

This scene corresponds to the primal mode in which vagal stimulation in feeding is a fundamentally social engagement, not just appetitive, and shows how vagal tone gets linked to attention, social interaction and soothing.

Vignette: Vagal Modulation in Social/Attentional Engagement

Now bring this scenario forward a few years:

At Starbucks I watch a four year old girl enter with her mother. The little girl is excited, running back and forth choosing between possible tables on which to put her crayons and paper and her cup of milk. Finally she settles on a table next to the armchair her mother selects. The little girl engages briefly with me where I sit across from them, telling me excitedly of the action figures she has brought with her. She listens to my ignorant adult questions about them, and explains patiently to me about the movie the characters come from and who they are. She then plays by herself with them while her mother has her coffee.

Eventually the little girl drops her action figures on the table, grabs a book from her bag on the floor and crawls up into her mother's lap, engaging her mother to read to her.

As her mother reads to her I can see that the little girl nestles warmly against her mother's chest, her little body relaxing and molding to her mother's body. She is attentive her mother's voice, pointing to the pictures in the book that go with the words—clearly this is a familiar and well memorized story—alternating easily between relaxed listening settled deeply into her mother's chest and more active engagement, pointing to and explaining the pictures to her mother. They read the book through and then the little girl moves back to her own chair and sits at the table next to her mother, drawing with her crayons, and periodically talking to herself quietly, while her mother reads the newspaper. Occasionally the little girl gets frustrated with something she is drawing and her mother, noticing this, talks to her in rhythmic and soothing voice which quickly calms her and sets her back on her track.

Although many readers might not think of these above examples as examples of vagal nerve functioning and development, the qualities of both these social engagements are underpinned by (VVC) vagal nerve response. In the first description of feeding an infant the obvious signs of vagal tone appear in the increasing calm and relaxation of the body, down-regulation of heart rate, and so on. Additionally, there is the vagal support for vocalization, eye gaze, the relational give and take which occurs, and also the mutual co-regulation of autonomic state which occurs when the infant's vagal tone state inducts the caretaker into their own increased parasympathetic tone.

In the second example of the child in Starbucks, we see the impact of adequate vagal development on the capacity of the little girl to regulate her arousal and excitement within the “middle range” of social engagement: to engage with a stranger without

untoward anxiety, to be regulated by the body-feel and voice of her mother, and to modulate her interest and activity as she alternates between relaxed but engaged listening to her mother reading with her own active commentary on the text she knows so well. I would add that Porges point is that vagal capacity actually underlies the little girls capacity to attend well and interact fruitfully.

The Polyvagal Theory helps us to reconceptualize the whole process of bonding in a more wholistic and integrated way because it brings into the picture the *autonomic substrata for relationship*. Porges model also demonstrates the integral social-relational dimension of learning, and how autonomic regulation by the caretaker helps to pattern into the body the self-regulatory capacity required for learning and attention, as well as for acquisition of stress tolerance and self-soothing.

I would add to this that the autonomic underpinnings of such early internal sensory experience forms many foundational qualities inherent in our felt, subjective, internal sense of self. Vagal tone and regulation results not just in externally observable behavior, the focus on Porges work, but also in subjective, internal bodily feeling. Thus bonding, learning and emotional self regulation are not so much based on cognitive schemas as they are *somatosensory* schemas, i.e. given in our sensory experience of our bodily life. This is why therapeutic work with the sequelae of early developmental disturbance is facilitated by body-oriented psychotherapy which can get at these core somatosensory experiences.

This has major relevance for psychotherapeutic intervention into problems rooted in early developmental dilemmas, such as problems with attachment and bonding. *It suggests that somatosensory methods of intervention which directly effect this level of experience and function, such as body oriented therapy methods which can effect the autonomic nervous system, would be of greater utility than cognitive or analytic methods.*

The ways in which vagal processes underlie bonding, intimacy, emotion as well as having implications for one's bodily, felt-sense of self can be richly appreciated in previous vignettes. We can also thereby appreciate that many psychotherapeutic concerns, such as difficulties in relationship or contact, difficulty self-soothing, lack of satisfaction in life, problems managing arousal levels and so on, could be seen as *vagal* in nature, underpinned by the adequacy of vagal response and tone.

We will look at how this applies in a clinical case, but before doing so we need to expand our notions of the vagus nerve further. In addition to Porges observations of it's psycho-physical functioning, we need to also appreciate how vagal tone might effect *somatic experience* and our subjective sense of self and our emotional experience.

Vagus nerve in the phenomenology of self

Although traditional science has taught that we cannot sense the functioning of our internal organs and that the autonomic nervous system, while it has sensory nerve fibers, does not report this sensation directly to consciousness, this does not appear to be accurate in our common experience. Nor is this the case in our clinical observation as body psychotherapists. There are many circumstances where we have significant visceral and autonomic body sensation. Strong emotions such as fear and anger are certainly an example of this. Even brief introspection reveals that the sensation of our

body core (the internal space of one's torso) is a constant background which gives us a sense of presence and substance, even when the sensation is not definitive or specific.

As a body psychotherapist working with intervention methods which directly effect the nervous system, we have found that our autonomic nervous system is not only experienced in certain emotions, but is also a constant background of sensation which supports our subjective sense-of-self. Our sense of who we are and how we feel is not just developed from a concept or cognitive schema, although it certainly includes cognitions, but is also made up of our sensory bodily experience, including our visceral sensations. Freud referred to this as the "body ego." Phenomenologists also based much of their approach on the way in which our fundamental experience of being-in-the-world is based on being embodied.

In this context, returning to the anatomical wandering of the vagus nerve from the brain through the torso described earlier, another way to think of the vagus nerve is that *it connects us directly to a vast portion of our interior* and thus to a large degree *it roots us in the internal subjective experience of our parasympathetic, "visceral nature."* By "visceral nature" I mean the sensations, activities and feelings which are based in our internal organs.

The vagus nerve does this through the most direct connection possible to our central nervous system: directly to the brain via the brain stem. Being a cranial nerve it connects us to our visceral insides not via secondary reflexes through the spinal cord, but directly between our brain, where our primary integrating consciousness is centered, and our organs, where our emotional response and experience is registered.

Vagal Emotions in common experience

In addition to the "sensations of self," the body ego rooted in visceral autonomic experience, our clinical experience suggests that the vagal system also generates sensation which is intrinsic to the visceral feeling of many *relational* emotions. The primary relational context is that of feeding, and in some way all our positive relational feelings are patterned on that substrata in the nervous system: safety, comfort, need fulfillment, satisfaction, fullness, warmth, love, etc. From this perspective, many of the cognitive schemas and behavioral sequences which we form are based on, reinforced and maintained by this primal visceral-somatic reality. Psychotherapy clients know this well in how changing the cognitive schema, through insight, analysis or cognitive work, doesn't always change how you *feel*. Body oriented psychotherapy is based on the importance of effecting the underlying body process which is involved in experience and in behavior.

As we have become able to specifically work with the vagus nerve we have become more sensitive to the realities of vagal experience in the emotional process of our clients. Since we now can even work selectively with specific portions and segments of the vagus nerve network, we have been able to see how change in vagal tone is not a broad all-or-nothing process as the research methodology tends to lead us to believe, but that different emotional experience appears to involve nuance of vagal stimulation or lack in different target organs.ⁱⁱ

You can explore some of this for yourself if you vividly imagine a situation in which you feel the following emotions, and notice the locus of the internal visceral sensation which comes to you.

Yearning

Deep yearning, that needy, wanting, hungry-for-other emotion, also appears to be rooted in many of the vagal responses that which have to do with orienting the head to the object of need: reaching with the mouth and lips for the nipple, sensations in the mouth and throat and tongue, the hollow and needful sensations in the throat and upper chest, and esophagus which are also vagal in nature (lack of vagal tone). The feeling of yearning first experienced mostly in the feeding situation, becomes increasingly connected to the relational and interpersonal world, and later appears in purely interpersonal contexts entirely separated from food. All the appetitive metaphors in relationship such as “skin hunger,” “hungry for your love,” “to devour your kiss with my mouth” are all rooted in this early, consummatory paradigm. My point here is that the connection of relationship to appetite is not symbolic but rather it is *literal*, in that we experience lack of vagal tone in yearning and rise in vagal tone in those portions of the vagus nerve network when our yearning is satisfied. Traditional body psychotherapies such as Reichian therapy (Reich, Lowen, etc) have called these concerns “Oral,” but the more accurate term from this a neuropsychological perspective might be “upper vagal.”

Longing

An emotion similar to yearning, but with a distinctly different emphasis, is that of longing. Longing for another or for something—we often use the term to describe longing for a time long past and so on—seems more centered on the heart, rather than mouth as is yearning. Longing appears to involve sensation the pharyngeal, cardiac and upper celiac portions of the vagus nerve and the accompanying vagal sensations. The “ache of longing in my heart” is the kind of sensation we are looking at here. Longing is more keyed to the relational aspects of the feeding paradigm: less about food-hunger and more about our need for soothing and comfort through another’s presence.

Comfort & soothing,

The primal vagal-feeding paradigm vignette presented earlier highlights how more “abstract” emotions of comfort, of fulfillment and of satisfaction are rooted in the stimulation of the vagus nerve in our early experience of feeding. Well before food is absorbed into the blood enough to be registered by the brain as blood sugar change, the act of ingestion, sucking and swallowing, stimulates vagal sensation in the mouth, throat and esophagus. This first increase in vagal tone in these specific body areas is intrinsic to the feeling of initial relief and soothing which only comes from another. This sensation of being soothed and comforted is *inside* us (as opposed to soothing derived from stroking to the skin and being physically held or rocked). This first increase in vagal tone from ingestion anchors the experience of soothing and comfort to the relational context. Disturbed early feeding can interfere with the capacity to experience relief, comfort and internal soothing from others, as well as difficulty in self-soothing, in later life.

Fulfillment, satisfaction and contentment

Continuing in the feeding paradigm, as the stomach is becomes filled with food, tone rises in the vagal nerves around the celiac area which enervate digestive organs such as the stomach, pancreas, liver, and duodenum. The feeling of being full-filled and satisfied

appears to be rooted in our capacity for parasympathetic sensation here. As the lower parts of the vagus nerve which terminate in the intestines are also stimulated the full-bellied sense of satisfaction, the feeling of being settled, of being “filled with” contentment is stimulated. One can well imagine how disturbances in vagal tone from the primal feeding situation could have a profound impact on ones capacity, to access the feelings of satisfaction, contentment and fulfillment in ones life.

Loneliness

Loneliness appears to be a complex of reactions in the vagal network. It appears to be a sensation of almost anesthesia or suppression in the celiac and esophageal portions of the vagus hollow, achy, needing-to-be-filled sensation, and a corresponding increase in vagal tone from the heart upwards with the increase in lachrymal (tearing) and salivary secretion.

Emptiness

The feeling of emotional and relational “emptiness” appears to involve a kind of numbing, disconnection or shut-down to vagal sensation especially from the neck down. To have no internal visceral sensation is to “feel nothing inside,” a report which is part of many psychotherapy complaints. This lack of internal visceral sensation undermines a person’s sense of meaning: meaning in life, meaningfulness of relationship, having a meaningful sense of oneself. Things “have meaning” not just because they accord with our intellectual values, but because we have an emotional, felt-response inside us to them, which tells us their valence. Meaning = feeling, as in “I have a good feel for that.”

In vagal shut-down and anesthesia one feels empty inside. This empty sensation can be developed into a variety of problematic conclusions, since we naturally struggle to make sense of this lack of valence and feeling for things in our lives. Feeling “nothing,” we may conclude that “I am nothing;” feeling empty inside us, we may conclude “my life is empty and meaningless;” lacking a deep internal emotional response to another we may conclude “this relationship is not deep;” and so on. Difficulty finding meaning in life may be influenced by difficulty having vagal sensation and tone.

Problems in the primal vagal-feeding situation could be envisioned to result in *lack* of capacity for certain affects, such as comfort, soothing, fulfillment, satisfaction or contentment, or in overly conditioned negative affect states such as emptiness, loneliness, unmet longing and other negative “ground states.” We could also appreciate that difficulty being able to feel some negative states, such as yearning for example, could be problematic in relationship: if you don’t feel yearning and longing, you don’t miss your loved ones sufficiently when they are absent and so motivate on-going attachment responses.

Clinical manifestation and intervention

Manifestation of vagal disturbance in adult clinical concerns

Problems in early development can range from severe disturbances of bonding and attachment to subtler disturbances which are the deeper ground for current behavioral and relational problems in psychotherapy. Along with this, we argue in this paper, goes

disturbance in vagal functioning and experience in some way. How might this more subtle range of disturbance in the vagal system be manifest in problems commonly brought to adult psychotherapy? Drawing from the previous descriptions we can suggest how certain adult complaints could be indicators of vagal dilemmas:

A. General indicators

Lack of sensory access to vagal sensations, e.g.:
 Lack of feeling of comfort in life.
 Lack of feeling of satisfaction in life.
 Inadequate tone and capacity in vagal system, e.g.
 Limited self-comfort and self soothing capacity.
 Difficulty regulating arousal levels:
 In a gradated way.
 Within “middle range.”
 Sympathetic nervous system dominance.

B. Repetition of negative vagal emotions

Chronic emotional states e.g. loneliness, emptiness, dissatisfaction, unease, alienation.

Lack of positive vagal states and feelings.

C. Vagal based negative cognitive belief structures

Humans are meaning making beings. We must make some kind of sense of our experience. Chronic emotional states, such as those above, give rise to self-reflection and consequent conclusions, explanations and cognitive schemas e.g. “I have to go it alone;” “There’s no support for me;” “I’ll never get what I want;” “There’s no comfort in this world for me;” etc.. Because the evidence for these cognitive beliefs is essentially “given in experience” they are therefore difficult to change via cognitive means alone without altering the neurobiological substrata for that experience.

D. Projection of vagal dilemmas (derived from B & C above):

Just as we derive cognitive belief structures from our neurobiological experience, we also project our personal and internal experience (or lack of it) on the external world. What originates as experience of one’s own vagal state can be projected and externalized, described as a condition of the environment, e.g.:

“The world is cold and unfeeling place,” (projection of “I am cold and unfeeling inside me”).

“The world is random, and all people are ciphers,” (projection of the sense of emptiness and meaninglessness of self from vagal lack). The “Franz Kafka effect.”

E. Body structure

Certain body structures such as the “existence” or “schizoid” structures cited by various BP’s often demonstrate dilemmas in vagal connection and energy. They appear narrowed and tight or undernourished, pulled in to the body core and have little capacity for energetic fullness in body core

Case Example- Disturbance of primal-vagal experience

The following case illustration reflects some of these elements and attempts to show how adult behavior, perception and experience is connected to early vagal-relational dilemmas. It will be followed by further case material describing how body oriented

intervention in the vagal system contributed to resolution of some of these clinical dilemmas.

From the time Joan was about six months of age her mother began what today would be probably be diagnosed as manic-depressive cycling. Her mother would alternate between periods of being severely depressed, lethargic and minimally responsive, with periods of psychosis where she would become hyperactive, and delusional. When her mother was depressed she was able to barely fulfill tasks such as child-care, and when she was manic she would be very involved with her infant Joan, but in ways which were intrusive, engulfing and were attuned to her own inner fantasy rather than Joan's needs.

Joan thus experienced periods when her own needs for feeding and comfort were alternately neglected, creating stress and distress, or responded to in an intrusive way based on her mother's needs (to be seen as a good mother, etc.) causing frustration and anxiety.

As an adult, these patterns were reflected for Joan in difficulties with balancing her work life and in intimate contact in her relationship. In her work Joan had great difficulty knowing when she was becoming over-stimulated and in regulating her stress level. She often would start significant projects at work near the end of her day and continue working on them at maximum output until late evening when she would come home exhausted, vibrating with tension and stimulation. When her husband, a warm and loving man, would welcome her eagerly she found herself becoming critical and rejecting. He was doing it wrong, it wasn't what she needed, and so on. She did everything she could to stop him in his tracks and push him away. She hated herself for treating him so harshly, especially when she knew that his intentions were genuine and guileless, but felt compelled distance him. It was Joan's disturbance about her reactions to her husband which brought her into therapy.

Joan also had a great deal of difficulty settling into herself and finding her internal, heartfelt feelings. Very intelligent, she oriented first always from a more analytical and intellectual mode. When she felt very safe with a person she was quite warm and caring, sometimes to the point of over involvement in managing others distress. When in difficult emotional conversations Joan tended to become analytical, problem solving and questioning about details

with the other person. Her adult children often complained to her that they seldom felt she heard or and acknowledged their feelings when they were trying to deal with emotional issues with her.

Surprisingly, Joan was quite social and had lots of friendships. A magnificent cook and hostess, she organized and orchestrated dinners and family affairs where her insistence on events happening “just so” created a predictable outcome for everyone. Despite this, internally she never felt quite satisfied with anything, leaving always restless and unable to settle in and enjoy her life accomplishments.

Body Oriented Intervention in Vagal Difficulties

All of this has particular importance if we have ways of intervening in autonomic bodily phenomena as we may in the body-oriented psychotherapies (BP). In BP, we are concerned with bodily basis of self-experience and self-functioning: how so-called “psychological” constructs are rooted in, developed from and maintained in our bodily experience and functioning. In the most generic definition, BP looks at the person’s functioning and experience as an integral body-mind whole: that our experience and functioning is fundamentally embodied in nature and can’t be separated artificially. In this view, psychological processes are fundamentally rooted in physical/somatic processes, and our bodily being is fundamentally expressive of our consciousness.

On the intervention side, BP sees both legitimacy and importance in *using somatic means to effect psychological ends* and using *bodily based techniques to explore and change experience*. To attempt to resolve emotional problems through purely cognitive means, when they are integral with body processes and experience, is to go the long way around. Talking and social interaction has a proportionally smaller “effect size” on neurocircuits and somatic process than body oriented interventions which work on the same level of system as these phenomena. One can talk at a piece of wood and eventually the auditory vibrations will smooth it’s surface, but it is faster to take sandpaper and muscular effort

This is especially the case with problems rooted in early experience where the “self” of an infant is not cognitive in nature at all—rather it is visceral and bodily in nature. That is to say, the “self” to an infant is a somatosensory experience, not a formulated cognitive construct. Patterns learned in this period of development are more often patterns of autonomic response. This autonomic responsiveness forms the experiential basis for later cognitive-affective schemas, including schemas which organize our self-experience into the abstract categories and descriptions we call personality. From a body psychotherapists perspective, therapizing focused on these abstract cognitive constructions is like trying to repair a house whose foundation is faulty by reconstructing it’s second floor walls.

Nervous System Energy Work

A colleague, Carol DeSanto M.A., and myself have developed a hands-on subtle energy approach called *Nervous System Energy Work (NSEW)* which focuses on enhancing energetic flow and connection in the nervous system (see www.pathwaysforhealing.com for more detailed information). *NSEW* starts from an understanding that the human nervous system, in addition to its physiological function, is also a system for distributing subtle energy in the body. This energetic flow through the nervous system nourishes and clears our cells, organs and body systems, and enhances our vitality and self-awareness.

In *NSEW* the practitioner generates and directs a flow of energy that clears, opens and reorganizes the circulation of energy through the clients nervous system. Since the nervous system transfers subtle energy very directly to body tissues *NSEW* is often experienced as having immediate and palpable effects on the body and on body awareness. One of the ways *NSEW* differs from some other subtle energy approaches is in its specificity.

By knowing specific nerves and nerve pathways, including the vagal and autonomic pathways, the *NSEW* practitioner can target very specific body areas and organs, and directly effect energy flow and functioning there. This is in contrast to other methods that work to give a broad supply of energy, and rely on it to somehow go where it is needed.

While this approach can be used as a “stand alone” integrative healing discipline, it also is a useful intervention method which integrates well with the aims of a body psychotherapy approach. Our explorations with the effect of improving subtle energy flow in the autonomic nervous system suggests that *NSEW* protocols have positive impact on increasing vagal tone¹. Our clinical experience is that *NSEW* work by an experienced practitioner can:

- Reliably induce parasympathetic states,
 - Distinctly enhance clients body awareness and sense of their internal connection to their visceral insides
 - And give better access to emotional experience.
- Repeated work over time appears to contribute to significantly increased vagal capacity, reduced sympathetic arousal and stabilization of autonomic functioning over time.

Case Example: Body Oriented Intervention

With Joan, there appeared to be a distinct imbalance and dysregulation between her sympathetic nervous system and parasympathetic nervous system. Her sympathetic nervous system hyper-reactive and dominant, while her parasympathetic nervous system appeared under-responsive and under represented in her autonomic response.

¹ A pilot study in Stephen Porges lab at University of Illinois at Chicago demonstrated that our *NSEW* protocol on the autonomic nervous system had a distinct, measurable and lasting effect on vagal tone in a sample of three subjects studied.

Interestingly, supporting these observations, Joan had a history of irritable bowel syndrome (IBS) and other digestive disturbances under stress, indicative of autonomic dysregulation.

While Joan knew the story of her early history and her mother's illness, and had been in traditional psychotherapy years previously, she had not before connected this early experience either to her tendency for over stimulation, nor to her reactivity to her husband's attempts to make contact. She had attributed the former to her "hard work" ethic and the latter, until recent events, to her husband's neediness. It was the clash of noticing her nastiness response to him with her self-image of being an otherwise kind and caring person which brought her up short, making her question her blame of him as defensive in nature.

My observations about the pattern of her work schedule and its impact on her state of agitation and sympathetic nervous system arousal caused her to question what had to her seemed merely a "natural" way of working. She noticed that, once she was "cranked up" beyond a certain point, she literally *could not stop* until she was exhausted— a sure sign to her that the state was controlling her rather than she controlling it.

We explored her process in more detail and began to get to know the indicators of these states in her current body awareness in the session. Although she began to notice the behavioral signs of hyper-arousal difficulty sensing much of her insides, her visceral body core, lead to her interest in using hands-on work to enhance her internal body awareness. The reactivity of her sympathetic nervous system was immediately palpable to me, and our first round of NSEW work focused on notching down the base arousal level of part of the nervous system.

As this work over a number of sessions lowered her sympathetic nervous system arousal level and reactivity she began to actually *feel* the impact of her frenetic nighttime pace more acutely, where before she had been numb to it. She could now identify a kind of nighttime hysteria and she could link this emotionally to what it must have been like for her as an infant: becoming more and more sympathetically aroused in the face of her mother's lack of attunement to her needs for comfort, soothing and feeding. Her here and now visceral and somatic sensations mapped well onto the primal feeding/soothing dilemma we could intuit from her history.

She also could now sense clearly *in vivo* that her irritable anticipation of her husband's "engulfment" as a result of her raw and over stimulated state— rather than his insensitivity— and how this must be mirroring her response to her mother's cycling between obliviousness to her infant's needs and intrusive and unattuned response. The lowered sympathetic nervous system reactivity which had come about through our *NSEW* work was yet insufficient to reduce her irritable response. She did not yet have access to internal sensations of self-soothing to support herself in this over-extended state. Instead, she felt she had to push him away, much like one's reflexive fending someone away from one's sunburned skin. Joan was, however, able to have a conversation with her husband about this so they could work together on better managing the sequence of her arrival home. With her sympathetic nervous system response more stable and Joan was able to foreshorten her work schedule to stop before complete exhaustion and her husband gave her more space before approaching her.

It was only when I began to work with her vagus nerve via the *NSEW* that her experience fundamentally shifted. I shifted the body oriented work to focusing on her vagus nerve. As this work progressed, Joan found that she was increasingly able to calm herself and further reduce her raw, irritable state.

Affectively, Joan was becoming able to sense and feel her internal visceral sensations, replacing the numbed and desensitized absence of internal sensation more normal to her. This led to seemingly paradoxical effects: on the one hand she was, for the first time, experiencing access to much deeper and more complete states of calm. A true parasympathetic state. This also reduced, not surprisingly, her IBS frequency. On the other hand, Joan was now contacting more visceral affect, including deep infantile grief and sadness related to her mother. I have observed that the reduction of chronic sympathetic nervous system arousal, i.e. chronic emergency state, combined with access to vagal sensation not infrequently makes for contact with viscerally held sadness and grief. The biological priority of survival, the fight or flight reaction of the sympathetic nervous system, counters our opening to any vulnerable and relational feelings. It is as if nature confirms the self-apparent truth to many that one cannot afford to be vulnerable in an emergency.

The positive result of this was that, once the waves of grief had been worked through, Joan found that she was able to actually meet and take in her husband's warmth and soothing, and she was able to better stay in affective contact with others. She could register her internal feeling in conversation and respond from her visceral sense in contact. This began to make for profound shifts in her relationships with her adult children and with others. We used verbal psychotherapy processing and gestalt experiment to experiment with applying her ability to access her internal feeling and a calmer, more emotionally available state to a number of relationship concerns.

Our clinical observation is that, through NSEW interventions which open and improve energy flow in the nervous system, we can have significant, palpable, and lasting impact on nervous system reactivity and subjective self-experience. The vagus nerve and its functioning is only one area this applies to. Others include increasing body awareness, furthering grounding, working with trauma states and reactions, reduction of pain response, and so on.

Further study is required to establish the extent to which the clinical observations and energetic work with the vagus nerve accord with actual measured tone response in the vagus nerve. Studies can be envisioned which correlate changes in vagal response and affective response, as well as with subjective reports of experience of self to such body oriented interventions. Basic measurements of the impact of NSEW on vagal response using heart rate differential would be a useful place to start.

Appendix Summary Chart: Increase in vagal tone and energy flow as it effects physiological, relational and subjective-experiential parameters.

The chart below correlates the physiological responses of the vagus nerve with the interactive/relational descriptions derived from Porges Polyvagal theory, together with our observations from clinical and body-oriented intervention. Our observations denote a much finer and segmental appreciation of the *experiential* aspects of the vagus nerve than has been described in the neurobiological literature.

Increase in vagal tone & energy flow as it effects:	Physiological	Interactive/Relational	Subjective Self-experience ⁱⁱⁱ
General Mammalian (VVC) vagal system–	Inhibits sns. Regulates middle range of arousal: rapid up/down regulation of <i>transitory</i> arousal, within <u>non-emergency</u> range (without sympathetic activation).	Frees attention from internal need state. Intake mode vs. output mode of sympathetic nervous system).	Feeling of safety. Sense of one's internal substance and presence. Settled and <i>internally</i> grounded downwards into torso. Sense of ones own fullness and substance.
Ocular segment	Stimulates eyelid muscles, opening eyes wider.	Increases gaze, supports attention and listening via focus, supports social-relational engagement in feeding.	Sense of being open and available to other in ones gaze and eye contact. Positive feeling about person seen.
Ear segment	Stimulates inner ear muscles to contract: selects sound frequency associated with human voice.	Supports: social-relational engagement in feeding (mother's cooing, vocalizing) attention and listening.	Influence on subjective self-experience unclear.
Oral/ Throat segment	Salivation Vocalization	?	Open (relaxed and available) to contact and <i>take in</i> from environment.
Pulmonary segment	Bronchial constriction	?	Diminished sense of lungs & relative heart and digestive organs.
Cardiac segment	Up and down regulation of heart rate and arousal without requiring sympathetic activation.	Arousal regulation needed to switch from speaking to listening	Warmhearted & open-hearted feelings, sense of being filled in heart.
Esophageal segment	Sensing passage of food through esophagus.	Connection between feeding sensations (easing of hunger, comfort, satisfaction) and relational comfort.	Feeling of satisfaction, being met and contacted
Celiac segment	Stimulates digestive secretions in response to presence of food	Sensations of fullness, satisfaction, and comfort, connected to social-relational interaction>> I can feel satisfied in contact.	Sense of inner fullness, satisfaction and comfort.
Enteric segment	Stimulates intestinal secretions and peristalsis	"Full belly" feeling of being filled and nourished by other >> human contact nourishes me.	Deep background sensations of enteric-visceral ease and flow: sense of personal ease and comfort of self.

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ⁱ Porges has proposed (Porges, in press) ways in which these autonomic neurocircuits underlie many pro-social behaviors, including attachment.

ⁱⁱ This is not to say that all the following emotions are purely vagal in nature. Beauchaine (200--) suggests a combination of sympathetic nervous system and parasympathetic nervous system for different emotional states, which accords with our clinical findings. For the sake of this discussion the emotions described here seem more predominantly vagal in nature and connect more specifically to the primal vagal-feeding paradigm. Details will sort out as we have more discriminative ways of measuring differential response in the autonomic nervous system.

ⁱⁱⁱ Data in chart (column 4) drawn from clinical reports of client experience using energy techniques which are capable of heightening experience of selected portions of vagal nerve system and of system as a whole.