

Working with the Neurobiological Legacy of Early Trauma

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*“I used to think that I was misplaced in time, but now I know
that it was time that got misplaced in me.”
Jill, an incest survivor*

Despite the fact that an estimated 70% of all psychiatric inpatients and 30% of outpatients have histories of psychological trauma, the effects of those histories often go unrecognized or underestimated. When my client, Jill, first began psychotherapy at the age of 16, she was depressed, suicidal, angry and oppositional, for no reason that her family or therapist could clearly pinpoint. Like most survivors of childhood trauma, her presenting issue was not framed as, “I was badly neglected as a kid by my alcoholic mother” or “My two older brothers sexually abused me and terrified my whole family.” At the time, she barely remembered what had happened: she only knew that she was filled with shame and rage and just wanted to die.

Like Jill, most trauma survivors present with the same complaints as any other client at the same age or stage: relationship issues, anxiety, depression, low self-esteem, loneliness and alienation, problems with anger. Even if we ask about early history, we may not get a report of neglect or abuse. Or we may inquire only about physical abuse or incest, not realizing that many types of neglect, separation, loss, attachment failure, or enduring environmental conditions can also have a traumatic impact on young children. If we work with children and adolescents, we may mistakenly expect that they will report the abuse. And we are unlikely to look for the “symptom-equivalents” of traumatic memory: intrusive fear, hypervigilance, chronic self-hatred, alienation from self and from one’s own body, disorganized attachment behavior in relationships.

But even if we recognize the warning signs of a childhood trauma history and correctly diagnose the post-traumatic stress, we still need to understand the pervasive neurobiological effects of trauma in order to effectively treat its aftermath. Because, ironically, the very same responses that preserve our physical and psychological integrity under threat also drive the symptoms of post-traumatic stress for months or years after the events themselves.

We don’t survive trauma as a result of conscious, frontal lobe decision-making. In the moment of life threat, our survival responses are set in motion by an area in the temporal

lobes called the limbic system, the repository for all of our emotional, sensory, and relational experience. The limbic system is a group of structures that includes the hippocampus, an important memory processing center, and the amygdala, the brain's "fire alarm" and smoke detector. When our five senses pick up the signs of imminent danger, that information is transmitted to the thalamus, our sensory information center, where, in a manner of nanoseconds, it is evaluated by both the amygdala and by the left orbital prefrontal cortex (LeDoux, 2002) to determine if it is a true or false alarm. The prefrontal cortex is designed to hold the "veto power:" if the stimulus is recognized as benign, the amygdala does not respond, but when the stimulus is determined to be threatening, the amygdala signals the hypothalamus to "turn on" the sympathetic nervous system. A cascade of neurochemicals from the adrenal glands initiates the adrenaline stress response. As we prepare to fight or flee, these neurochemicals cause an increase in heart rate and respiration, maximizing oxygen flow to muscle tissue and 'turning off' other non-essential organ systems, including the frontal cortex. We are in "survival mode," where pausing to think might waste precious minutes of response time, but the price of automatically engaging instinctive animal defense responses is that we lose the ability to bear witness to the entirety of the experience.

As we are mobilizing to flee or fight, the adrenal glands initiate reciprocal activity in the parasympathetic nervous system, preparing us for the cessation of danger and recovery from the event. Production of cortisol increases; heart rate and respiration slow down; and frontal lobe activity resumes but often hyperactively, causing intrusive thoughts and images of the event. In case fighting or fleeing is not adaptive or possible, the parasympathetic nervous system also offers two other survival alternatives, freeze and submission. Children, for example, are almost entirely dependent on freeze and submission responses, as are battered wives, prisoners of war, and hostages. Following the event, after we have shaken and wept and trembled until our bodies recalibrate, the hippocampus is responsible for putting the experience into chronological order and perspective preparatory to its transfer to verbal memory areas in the cortex during sleep. However, the hippocampus is one of the "non-essential" parts of the mind and body that are suppressed under threat. So, for the very worst of human experiences, the human mind and body are impeded from the job of preparing us to make meaning and sense of what has happened.

As the price for our surviving the experience, then, we are left with unfinished neurobiological responses and an inadequate memory record of both what has happened and how we endured it. If the experience is a single event, and we have adequate support afterward, and we have had little or no prior trauma, then we will be left shaken, but the events will feel "behind" us now. If traumatic events have been recurrent, and/or we are developmentally vulnerable, and/or we have inadequate support, we can be left with a host of 'implicit' memories, intense responses and symptoms that "tell the story" but without words and without the knowledge that we are remembering (Siegel, 1999). Worse yet, if the environment is chronically traumatizing, as are most childhood traumatic environments, the survival response system will become chronically activated, resulting in long-term effects on the developing brain and body.

Now, let's make it even a little more complicated. When the victim of the traumatic event is a child, he or she is faced with an additional risk factor: at the moment of threat, children are biologically "wired" to seek proximity to a parent figure for safety (Cassidy, J. & Shaver, P.R., 1999). But, for children, these threats are 90% likely (van der Kolk, 1996) to emanate from the immediate family. Thus, the very person to whom the child would instinctively turn at the moment of danger is also the source of danger or the source of non-protection from danger. This dilemma lays the groundwork for "disorganized attachment," an attachment style found in children as young as 12 months of age whose parents are characterized by researcher observation as either "frightened" or "frightening" (Carlson, 1986; Liotti, 1999). In this attachment paradigm, the child demonstrates truncated and ambivalent proximity-seeking responses: she or he turns or moves toward the parent, but then stops, freezes, backs up or turns away, often with a glazed or frightened look. In the context of abusive or neglectful parenting, the attachment drive is intensified, but so are the survival responses of freeze or flight. This disorganized attachment paradigm then comes to complicate all subsequent relationships, including that with the therapist.

By the time the trauma survivor appears at our doorstep, the neurobiological and psychological effects of a hyperactivated autonomic nervous system and disorganized attachment patterns will have become well-entrenched, familiar, habitual responses. These symptoms now subjectively feel like "just who I am." In the words of my client, Elizabeth, "it was bad enough that I was abused and neglected by my family and had to spend the next twenty years trying to survive what happened, but why did it have to affect who I am?" The symptoms that come to seem "just who I am" are the conveyors of the history that cannot be fully remembered or put into words.

In addition, other symptoms develop that represent valiant neurobiological attempts to cope with the trauma: self-injury and suicidality, risk-taking, re-enactment behavior, caretaking and self-sacrifice, re-victimization, and addictive behavior. All of these represent different ways of modulating a dysregulated nervous system: self-injury and planning suicide both induce adrenaline and endorphin responses; self-starvation and overeating each induce numbing; and addictive behaviors can be tailored to induce either numbing or increased arousal or a combination of both.

What are the implications of a neurobiological perspective for how we treat the symptoms of trauma? Do we treat the low self-esteem? The self-harming and sabotaging? The transference manifestations? Or the events themselves?

Historically, in the mental health field, we have treated the traumatic events themselves: in psychodynamic therapies by recalling the memories and their associated emotions; in behavioral treatment by attempting to de-sensitize the client to the impact of the memories through "exposure" techniques; in EMDR (Eye Movement Desensitization and Reprocessing) therapy by "processing" the visual images, cognitive schemas, emotions and body sensations connected to the event memories. But the narrative memories are connected to intense states of autonomic arousal, an evolutionary adaptation to the chronically threatening world of early mankind. When stimuli directly or indirectly

connected to the traumatic event or its context evoke the same defensive responses necessary then, we are better prepared to respond adaptively. We are 'ready.' Even "thinking about thinking about" the memories is often enough to cause a reactivation of the nervous system as if the events were recurring in the here-and-now. The neurobiological research and increased understanding of the somatic legacy of trauma advises us to take a new and different course in treatment.

Instead of treating the events through narrative recall, we need to treat the effects of those events as they repeatedly recur in response to subtle or not-so-subtle reminders of the original trauma. We need to challenge the subjective perception of traumatized clients that the symptoms are just "who they are." We need to counteract the habitual trauma responses by calling attention to them, by providing psychoeducation about how and why they are symptoms, by "waking up" the frontal lobes, by encouraging mindfulness and curiosity in place of reactivity, by pacing the treatment and the exploration of the past in such a way that the autonomic nervous system gets a chance to experience regulation instead of dysregulation, by encouraging the developing of new responses to triggers or memories that compete with habitual responses. In traditional trauma treatments, it was assumed that enough re-telling of the story or experiencing of the feelings would enable new responses to develop naturally. The neurobiological research tells a different story: the limbic system will always have a tendency to respond to a reminder of threat as if it were a threat unless the frontal cortex can tell it to "hold off" sounding the alarm. In fact, the re-telling of the story has more of a chance of reactivating the limbic system than it does of desensitizing it. To actually desensitize or transform a traumatic memory, we need either to change the mind-body responses to that memory or to reinstate activity the frontal lobes to interpret the responses differently as sensation rather than threat.

In the 21st century, we have been challenged to develop new therapeutic techniques that can provide these missing experiences. Increasingly, therapists are being trained in EMDR techniques that cultivate new responses to old stimuli, such as Resource Development (Korn and Leeds, 2001) and Developmental Needs Meeting (Schmidt, 2000), or that process the cortical and subcortical components of unresolved events. Patients are increasingly being sent to acupuncture, massage, yoga, and meditation classes as adjuncts to psychotherapy. Therapists are employing somatic and energy therapies to teach clients how to calm the nervous system, how to shift states of consciousness, how to imagine new responses and experiences. Increasingly, body-centered psychotherapy for trauma, in particular Sensorimotor Psychotherapy (Ogden, Minton & Pain, 2006) is being utilized to re-train trauma-related somatic and emotional responses.

Sensorimotor Psychotherapy offers a way to address the somatically-based symptoms of trauma through approaches that "uncouple" the traumatic events from their legacy in the form of intense feelings, bodily responses, and punitive cognitions. Developed in the 1980s by Pat Ogden, Ph.D. (and enriched by contributions from the work of Alan Schore, Bessel van der Kolk, Daniel Siegel, and Ellert Nijenhuis), Sensorimotor Psychotherapy combines traditional talking therapy techniques with body-centered interventions that directly address these neurobiological effects of trauma. By

using the narrative just to evoke the trauma-related bodily experience and making that “sliver” of memory the primary entry point in therapy, we attend first to how the body has “remembered” the trauma and only later to emotional meaning-making. Unlike most body-centered therapies, Sensorimotor Psychotherapy includes the use of physical touch as an option but is not inherently a “hands on” approach, making it easy to integrate into more traditional psychotherapeutic models in which touch is not used. Instead, Sensorimotor work emphasizes the restoration of the “witnessing self” and the cultivation of new experiences that challenge the habitual trauma-related body responses, rather than repeat or re-activate them. Sensorimotor Psychotherapy as a modality recognizes that, no matter how safe and connected the trauma survivor’s relationship to the therapist, it will not prevent the activation of trauma responses in that or any other relationship. Instead, feeling safe in relationship must come from changing the responses: stepping back from them, using the frontal lobes to reality-check their proportionality, and thoughtfully practicing new actions and reactions that shift the experience from “life-or-death” to “here-and-now.”

A client of mine, Meredith, shared the power of one of those moments recently: describing how she had been triggered by learning that she and her partner had not qualified for a mortgage:

“For a moment, all was lost: we would be left homeless or in a trailer park somewhere—my heart was pounding and I couldn’t breathe—I just wanted to die—what was the point of living? And then I started to laugh. I ‘came back’ to my senses: how absurd to want to die every time I encounter an obstacle! We have everything else we want,” she said, “and my job is to remember that **disappointment is just a trigger, not a catastrophe.**”

Like most survivors of trauma, she had interpreted the body sensations and painful emotions as evidence that something was terribly wrong with her current here-and-now environment: that the mortgage rejection was proof that her life and future were at risk. Since the distress and accompanying beliefs and body responses were coming up in present time, unconnected to the original events that caused them, it was only natural that she would interpret them as data about her current situation. Yet they made much more sense if we understood them as manifestations of an amygdala sounding the alarm. And why did that particular trigger set the alarm bells ringing? Why did her amygdala respond to that particular stimulus?

As her therapist, I was well aware that the alarm response was connected to Meredith’s childhood past, a past in which her alcoholic father kept putting the family’s safety and stability at risk, forgetting to pay the bills, threatening to kill himself when the lights or telephone would then get turned off. In a traditional psychotherapy context, I would have made that comment to her as an interpretation intended to foster increased insight and a more rich, integrated self-narrative. Instead, using a sensorimotor paradigm, I simply asked her to notice this new experience she was having: what it was like to know ‘in the body’ that disappointment is not dangerous and doesn’t mean there is a catastrophe.

“How can you tell?” I asked. She laughed again and said, “Because as soon as I say the words, ‘disappointment is just a trigger, not a catastrophe,’ my body relaxes, and I want to laugh!”

In this vignette, you can see the elements of Sensorimotor Psychotherapy that seem to be most powerful in helping to resolve traumatic experience: the therapist’s restraining the impulse to interpret the client’s over-reaction, the client’s ability to stand back and be curious about that strong reaction, the encouraging of the client to “just notice” her experience, and taking the time to observe how her body was telling her that disappointment was safe, not dangerous. This mindful noticing of the body’s response to an experience is an example of ‘parallel processing’ or dual awareness. Using mindful dual awareness, the client learns to stand at a slight distance from what is happening emotionally and physically and just observe the sequence of feelings, thoughts and body sensations that follows. Dual awareness and parallel processing are the manifestations of self-witnessing, the very ability that is lost at the moment of trauma when the amygdala sounds the alarm, the frontal lobes go ‘off line,’ and we fight, flee or submit instinctively and often unconsciously. As Bessel van der Kolk says, “You cannot be re-traumatized as long as you are able to have parallel processing.” Mindfulness appears to act as an ‘all-clear’ signal to the body (LeDoux, 2002): once the frontal lobes are back ‘on line,’ the body can relax and know that everything is ‘OK.’

In a body-centered psychotherapeutic approach, the focus is on directly addressing the neurobiological effects of trauma described in this article. By focusing on the here-and-now thoughts, feelings, and body sensations, whether or not connected to the narrative, the client is not unduly autonomically or emotionally activated. By letting go of the thoughts and beliefs that intensify the sensations, it is easier for the client to stay curious and in a state of dual awareness. Through the practice of stimulus discrimination (discriminating trauma-related stimuli from actual threats), the client can begin to challenge the trauma responses just the ‘right amount’ without triggering more traumatic activation. Then, last but not least, notice the results: a trauma survivor who ends a session with laughter and a sense of mastery in relationship to the overwhelming emotions and recurring dread of humiliation.

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