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Grounding Judith Herman's Trauma Theory within Interpersonal Neuroscience and Evidence-Based Practice Modalities for Trauma Treatment

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ABSTRACT

In 1992, Judith Herman published her seminal work, *Trauma and Recovery*, which outlined new concepts for understanding, defining, and treating posttraumatic stress disorder (PTSD). Although written over two decades ago, Herman's work is still considered an essential work in the field of traumatology. This article links Herman's central concepts of terror, hyperarousal, constriction, and intrusion with neurobiology of trauma. Her triphasic model of treatment will be discussed with linkages to the neuroscience that shape intersubjective relational-right brain interventions. Finally, practical applications of current neurobiologically informed trauma therapies based on Herman's central concepts are examined.

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In 1992, Judith Herman published her seminal work, *Trauma and Recovery*, which outlined new concepts for understanding, defining, and treating posttraumatic stress disorder (PTSD). Herman's theory was based on years of working with individuals who had suffered from trauma, including survivors of sexual assault, interfamily violence, natural disasters, and military combat (Herman, 1992a). Judith Herman has been described as a “pioneering clinician in the field and a major player in the theoretical debate,” and although her book was written over two decades ago, Herman's work is still considered an essential theory in the field of traumatology (Suleiman, 2008, p. 285).

The period immediately following publication of Herman's 1992 work is often called “the decade of the brain” because of the manifold increase in the amount of neurobiological research on trauma. Herman's theories were generally consistent with, and often elegantly illustrated, many of the scientific findings that this research later established. However, no specific linkage has been made thus far to showcase how Herman's work also falls in line with neurobiology and modern PTSD treatment.

This article links Herman's 20-year-old conceptualizations with present-day understanding of trauma and its impact on the body as well as the psyche. This article also establishes the strong bonds between modern neuroscience and Herman's triphasic model. The authors will create a bridge between today's scientific research and Herman's theory, which was born out of research from best practices dating back to the era of Sigmund Freud and Pierre Janet, for two reasons. First, this discussion will provide the current generation of therapists with the confidence to embrace Herman's model. Second, the authors wish to encourage other clinicians to fold the evidence-informed practices of neuroscience into their trauma work. Herman's triphasic model of treatment will be discussed at the end of this article, along with linkages to the modern neuroscience that has so profoundly shaped relational-right brain interventions for trauma interventions.

Brief overview of Herman's theory of PTSD

Judith Herman's book argued that the experiences of survivors of military, political, sexual, and interpersonal violence had common threads in their clinical trauma symptoms. Herman (1992a) also asserted that psychological trauma, and the likely outcome for a survivor, is often influenced by the society in which such trauma occurred. Her findings, along with this powerful argument in favor of contextualizing the environment and a person's reaction to overwhelming life experiences, had the important effect of shifting blame away from survivors, who previously were often viewed as weak and defective for their suffering. Neuroscience in the context of traumatology does the same, as it speaks to biological reactions to trauma, not symptoms as a personal deficit. Herman divided her book into two parts the first part related to history, qualitative differences in trauma, and the symptoms of PTSD and the second part to the treatment of PTSD. The following discussion will be divided into two parts as per Herman's design.

Terror

Herman's work defined PTSD as the direct result of an encounter with an event that overwhelms one's adaptive responses to life coupled with helplessness and terror (Herman, 1992a). Yet Herman postulates that helplessness and terror are not sufficient to explain the individual's reaction to a traumatic event. Response to threat and danger is an inherent part of the human condition, and each individual has his or her own process of resistance against a threat (Herman, 1992a). Therefore, Herman believed that hopelessness was not defined by just the inability to act, but, when acting, there is no hope for change. As stated by Herman (1992a):

Traumatic reactions occur when action is of no avail. When neither resistance nor escape is possible, the human system of self-defense becomes overwhelmed and disorganized. Each component of the ordinary response to danger, having lost its utility, tends to persist in an altered and exaggerated state long after the actual danger is over (p. 34).

Therefore, Herman contended that many of the symptoms of PTSD were not born of hopelessness, but rather of the individual's futile efforts to protect himself or herself against the trauma (Herman, 1992a). She outlined the attempts to reconcile the trauma in three dialectical concepts: hyperarousal, intrusion, and constriction (Herman, 1992a).

Hyperarousal

Herman noted that, after a traumatic event, an individual's sense of self-preservation seemed to be in a state of perpetual high alert, a state defined by a high startle response, intense responses of anger and irritability that are brought on with minimal provocation, and deprived sleep (Herman, 1992a). Herman's findings arose from her early work with soldiers from the Second World War, where she noted that the veterans seemed to suffer from "chronic stimulation of the sympathetic nervous system and those traumatic events seem to recondition the human nervous system" (Herman, 1992a, p. 36). Herman believed that this was caused by the shattering of the normal "baseline" level of "alert but relaxed attention" and the establishment of a new, elevated "baseline of arousal" where the individual constantly perceived danger (Herman, 1992a, p. 36). This state of hyperarousal can be witnessed in trauma victims who exhibit a low frustration tolerance, are quick to anger, or find themselves waking in the middle of the night at the slightest sound in their environment.

Intrusion

The second defining concept of terror is intrusion, or the reliving of events with the same vividness and emotional force as if they were happening in the present and are potentially caused by seemingly insignificant reminders (Herman, 1992a). Herman considered several theories to explain the cause of intrusion and, ultimately, sided with the belief that it is the brain's futile attempt to make sense of, or master, the memory. However, she considered these intrusions to be unwelcomed and that they caused the individual to be constantly "buffeted by terror and rage" (Herman, 1992a, p. 42). As a result, many trauma victims experience feelings of helplessness and sadness that do not dissipate over time.

Constriction

The third defining reaction to terror is avoidance, which is a maladaptive attempt to cope with traumatic environments or stimuli. This behavior is demonstrated by attempts to withdraw from others, a narrowing of perception, and an impoverished life (Herman, 1992a). For some, this constrictive state begins at the time of the trauma through dissociation or numbing of the self so as to separate from intolerable pain, uncontrollable rage, or intense terror. Herman claimed that dissociation, constriction, and numbing are all altered states that assist in keeping the experience "walled off from ordinary consciousness" (Herman, 1992a, p. 45). Therein key characteristics of constriction include the

avoidance of emotion, failure to plan for the future, and that the failed or maladaptive coping is part of PTSD and not a result of PTSD (Herman, 1992a).

Seating Herman's theory into a neurobiological framework

To place Herman's theory in a neurobiological context, it is important to first understand that fear, terror, and the ability to react to such are formed within the amygdala. The home of the brain's earliest form of memory, the amygdala is operational at birth and creates unconscious mental models or representations of safety and danger within the brain (Badenoch, 2008). These unconscious mental models are used to react favorably to a warm greeting and smile or to the danger of a snake by initiating the body's fight, flight, or freeze mechanisms and the body's sympathetic nervous system (Badenoch, 2008; Cozolino, 2010).

Herman's remarks on terror are neurobiologically demonstrated through the amygdala's unconscious scanning of external cues appraising for signals of previously threatening stimuli to prepare the body to fight, flight, or freeze (Badenoch, 2008; Cozolino, 2010). Porges (2009) noted this unconscious scanning as "neuroception" (p. 5). That is, the potential for threat is primed in the amygdala, and it results in the client experiencing hyperawareness and heightened startle responses. A perceived threat results in the unconscious brain's flight response, activating the sympathetic nervous systems, which triggers increased heart rate, blood pressure, and oxygen levels while heightening senses and increasing reaction times so as to prepare the body to flee from danger (Applegate & Shapiro, 2005; Cozolino, 2010; Van Der Kolk, 2014).

Similarly, if the danger is unconsciously perceived as overwhelming and a freeze response is initiated, the sympathetic nervous system will activate the dorsal vagal parasympathetic response (Applegate & Shapiro, 2005; Badenoch, 2008; Cozolino, 2010; Van Der Kolk, 2014). Herman's theory contained elements of this neurobiological finding, as she argued that the freeze response's lasting effects as caused by terror manifested in behaviors such as constriction of affect, dissociation, and numbing after the traumatic event.

LeDoux (1996) is credited with discovering that fear-evoking stimuli can alert the amygdala via either a "high road" or a "low road." The "low road" uses the brain's thalamus to communicate with the amygdala in an almost-immediate response, thus eliciting fear and increased arousal from the nervous system (also known as sympathetic nervous system response). The "high road" uses the neocortex (or "human" brain), to first understand the stimuli, then alert the amygdala after an appraisal has been made whether the stimulus deserves to be feared (LeDoux, 1996). The "high road" process begins in the thalamus and moves through the cerebral cortex and then the hippocampus, where the executive processes of the brain more carefully assess, compare the stimulus with prior memories, place the memory within an autobiographical context, and, finally, attempt to make sense of the situation (LeDoux, 1996).

Herman's concept of "terror" can now be described as the nervous system's reaction to trauma. In the divided right and left hemispheres of the brain, terror sits in the right hemisphere, which is more dominant during autonomic or unconscious processing (Gainotti, 2012). Fear stimuli evoke the "low road" to activate the sympathetic nervous system. Additionally, the student of neurobiology can observe how Herman's work laid the groundwork that described how PTSD activates the hypothalamic-pituitary-adrenocortical (HPA)-axis's response to trauma. The HPA-axis is responsible for the "physiological homeostasis" and can be activated by extreme high levels of stress (Siegel, 1999). A severely traumatized client has become calibrated to sustain high levels of HPA-axis activation and sympathetic nervous system arousal. The autonomic nervous system (which regulates the parasympathetic and sympathetic responses) and the HPA-axis are unconscious processes or, to be put into neurobiological language, they are not something the client's mind can understand or control very well. These systems operate from a bottom-up (amygdala-controlled) "low road" circuitry instead of being cognitively assessed (or "high road"), where the person has conscious control in making the decision as to whether he or she wants to be stressed.

If an initial fast assessment is made to activate the HPA-axis but the slow memory perceives the situation as nonthreatening, the brain will disengage the HPA mechanism to inhibit sympathetic nervous system (the gas) and engage the parasympathetic (the brakes). When the system becomes dysregulated, as caused by trauma, the feedback loop between fast and slow can be interrupted, which can result in a continual loop of hyperactivity, intrusions (flashbacks), and prolonged constriction (dissociation).

Herman's understanding of constriction also meshes well with what modern neurobiology has found. Polyvagal theory understands the "constriction" observed by Herman to be a function of the social engagement system that has evolutionarily evolved over thousands of years (Porges, 2001). Porges describes how the vagus nerve, in essence, is responsible for the muscles in a primate's face and head that show the feeling state of that animal. The muscles are controlled by the cranial nerves that develop in utero and respond to the emotional complexities that a person experiences. Herman was observing the constricted affect that many trauma survivors will exhibit, something that is often evidenced by the reports of trauma victims who say they have "changed" in pictures of themselves or from family members who sense trauma on the victim's face even when the victim has not disclosed the traumatic incident.

Porges (2001) describes the vagus nerve as the "global social nervous system" (p. 124) that shows the world how the person feels inside. Porges (2001) states, "The social engagement system not only provides direct social contact with others, but also modulates physiological state to support positive social behavior by exerting an inhibitory effect on the sympathetic nervous system" (p. 144). This "inhibitory effect" is the concept that Herman was probably referring to in her "reconnection" stage of her triphasic model and will be described next in much more detail.

Table 1. Theory.

Herman's Language	Neurobiology
<i>Terror: When neither resistance nor escape is possible, the human system of self-defense becomes overwhelmed and disorganized. Each component of the ordinary response to danger, having lost its utility, tends to persist in an altered and exaggerated state long after the actual danger is over (Herman, 1992a, p. 92).</i>	Freeze response. Dissociation. Extreme parasympathetic response to danger and threat.
Hyperarousal: A state of perpetual high alert, high startle response, intense responses of anger and irritability that are brought on with minimal provocation, and deprived sleep (Herman, 1992a).	Elevation in the sympathetic nervous system arousal resulting in increased heart rate, blood pressure, and oxygen levels while heightening senses, and increasing reaction times (Applegate & Shapiro, 2005; Cozolino, 2010; Van Der Kolk, 2014).
Intrusion: The reliving of events with the same vividness and emotional force as if they were happening in the present and are potentially caused by seemingly insignificant reminders (Herman, 1992a).	Limbic system positive feedback loop: where intrusive memory or flashback produces a stress hormone that acts to strengthen the memory, thus increasing the likelihood of its continuation (Cahill, 1997).
Constriction: Withdrawal from others, numbing of the self so as to separate from intolerable pain, uncontrollable rage, or intense terror, a narrowing of perception, and an impoverished life (Herman, 1992a).	Polyvagal theory: disruption of the dorsal vagus system or the brain's unconscious method of social engagement (Porges, 2001).

Although neuroscience was largely still in its infancy during the writing of Herman's theories, she was a keen observer into how our bodies respond to trauma and many of her theories complement the field's later scientific findings. In summary, Herman's trauma theory, as illustrated in Table 1, described HPA activation, the sympathetic nervous system's response to trauma, and how the vagus nerve plays into the social interactions of a traumatized person. Herman observed the consequences of how our amygdala and hippocampus protect us from extreme forms of captivity and terror and postulated a trauma psychotherapy that could assist the trauma survivor with coming out of the dissociated responses from terror.

For treatment, Herman outlined a triphasic understanding of how to heal trauma, which we can now see addresses the hyperarousal (physiological response to trauma) before the orbitofrontal is accessible and able to process trauma memory. Herman describes her treatment phases as safety, remembrance and mourning, and reconnection.

Treatment: Brief overview of Herman's triphasic model of recovery from PTSD

In the second half of Herman's book, she discussed a common pattern of recovery seen in the trauma survivor. She introduced a model of recovery that has three parts: safety, remembrance and mourning, and reconnection. To extend this into neurobiological language, Herman showed trauma therapists

how to focus on the nervous system: agitation (safety) first, before processing the hippocampal memory and neocortex assimilation of the trauma (remembrance and mourning), and finally, she encourages therapists to help the trauma survivor reengage with life and downregulate nervous system agitation with social interactions (reconnection). Her treatment model is based on reestablishing the clients' sense of empowerment and connection to themselves and to those around them. The model is client focused and places a great emphasis on what Herman defined as the healing relationship between the therapist and the client. It is a trauma psychotherapy that is relational or, to use neurobiological language, uses regulation theory to assist the client in learning affect regulation within the therapist–client dyad (Schore & Schore, 2014).

This section will showcase the linkage of Herman's treatment concepts, along with neurobiologically informed interventions, through the case of Rachel.

When Rachel, a 27-year-old Asian American graduate student, entered therapy, she felt like her mind and body were betraying her. Her mind raced with scenarios of how she might be harmed, her body was tense and constricted, and she startled at things that she might normally scarcely notice. She was referred to therapy by her supervisor and mentor who had recently written her up for poor performance, citing unprofessional behavior, noting that she is often irritable and has been submitting her work past deadlines.

At the time Rachel began treatment, she had not connected her current mood and behaviors with an event from the prior semester, when she had experienced a loss of consciousness and awoke naked in a male student's bedroom. While colleagues seemed to laugh the event off as “a drunken night,” Rachel was left deeply unsettled and noticed that she “zoned out” soon thereafter, almost forgetting it had ever happened.

While Rachel did not realize it, her symptoms represented hallmark posttrauma reactions. For instance, her irritability was related to hyperarousal, scanning for danger and being in a constant state of alertness. She slept very little, drinking coffee late in the night, not feeling safe to sleep. Intrusions arose with unwanted thoughts of the morning she awoke feeling alone and helpless. Constriction was at play, as Rachel tried to lose herself in her work as a means of avoiding others because she just wanted to be alone. She felt numb, in a fog, and isolative behavior helped her feel safer until inevitably she would feel suddenly terrified, rageful, and hopeless. As deadlines loomed and then passed, Rachel felt shame and a sense of failure. “I always had my mind, and now I don't have that anymore.”

Herman's concept of safety

Herman described the first stage of trauma treatment as beginning the healing process where safety and trust are developed within the therapy room. Herman stated therapy should focus initially on “control of the

body, restoration of the biological rhythms of eating and sleep, and reduction in hyper arousal and intrusive symptoms” (p. 161). Using neurobiological language, “safety” could now be summarized as focusing on the survivor’s ability to autoregulate and begin to control the autonomic nervous system’s response to danger and trauma. Once this has been managed, many biological symptoms caused by autonomic arousal such as sleeping disturbances, eating disturbances, concentration difficulties, and other extreme forms of being overwhelmed can be contained.

In the case of Rachel, these symptoms can be seen as the hypervigilance and agitation symptoms that cause her to feel tense throughout the day. These symptoms are preventing Rachel from being successful in her work and from engaging normally in her life. This has made her say, “I don’t have my mind anymore” as a way to showcase how out of control the hyperarousal is causing her to feel. Engaging a client in therapy at this time is dependent on their new ability to trust the therapist and to begin to learn skills that that help her body feel more in control. Giving the client tangible strategies to downregulate their sympathetic arousal and help them feel more in control is an important first step to feeling “safe” again in her life.

Herman aptly identified that survivors feel a loss of control in the very place that it is most needed, in their bodies. Modern neuroscience has now identified that this process takes place on an autonomic, cellular embodied level, which is not in the mind alone. To this point, Van der Kolk (2009) states:

What most people do not realize is that trauma is not the story of something awful that happened in the past, but the residue of imprints left behind in people’s sensory and hormonal systems. Traumatized people often are terrified of the sensations in their own bodies (p. 24).

Neuroimaging studies of trauma survivors show that “executive functioning” becomes less active. Executive functioning, such as impulse control and inhibiting undesired actions, becomes harder to anticipate (Van der Kolk, 2014). When the survivor is triggered, higher brain functions have less control, and the automatic protective functions of the body mobilize, including the sympathetic arousal response to fight or flee or, conversely, parasympathetic activation for dissociation and numbing.

Herman viewed the primary role of the therapist as “ally and witness,” which is an essential part of the safety process in her triphasic modality (p. 123). The therapist and client must engage in a dance of developing trust and rapport, while simultaneously working toward skill building.

Rachel was first seen by a university counseling center therapist and then referred to a specialized therapist for trauma-focused work. At the outset of therapy, Rachel wanted to feel better but didn’t believe that talk therapy would help her because she was afraid to discuss the details of that night. Understanding that Rachel’s body could not be soothed until her

rational mind (prefrontal cortex) had understood the steps that therapy would take, the therapist created a frame for the work by sharing what to expect from sessions, such as the length of sessions, the benefit of regular meetings, and that they would not be processing the specifics of the trauma until her mind and body had learned to rebalance and could respond to such a stressor. Once Rachel understood that she was not going to be pushed to relive the trauma in that moment, she became more open to body-based relaxation techniques that the therapist introduced. The therapist began to lead Rachel through autoregulation strategies that included breath work and yoga. By learning to monitor her breathing, Rachel was able to downregulate her agitation and feel more in control. The therapist understood that by teaching Rachel to downregulate her anxiety and fear, she was actually helping shift her nervous system to a parasympathetic state. Rachel would feel less tense and more in control of her emotions for the moment.

At the outset of therapy with a traumatized client, the clinician must remain consistently aware that insight alone is not sufficient to diminish the automatic tendencies of the mind and body; the prefrontal part of the brain cannot control emotional arousal and stop trauma-related sensations from arising (van der Kolk, 2009). In practical terms, this phase of treatment is focused on relaxation interventions, teaching the trauma survivor to feel in control of her anxiety symptoms and allow the client to regain control over her biological rhythms. Educating the client on how to dearouse her nervous system through breathing, relaxation, yoga, mindfulness, and emotional ventilation is key to helping the trauma victim move through the activation and into a place where the client can feel more at ease in the world. Once the trauma survivor is beginning to sleep regularly, recover from panic, and feel less reactivity in her startle reactions, the second stage of Herman's conceptualization can begin to evolve.

Remembrance and mourning

Herman (1992a) identifies her second stage of trauma therapy as "remembrance and mourning" of the assault (p. 175). In this stage, the survivor has regained control over her hyperarousal and will begin to tell her story of trauma and "transform the traumatic memory so that it can be integrated into the survivor's life story" (p. 175). Using neurobiological language, this can be understood as the continued work and evolution of the client's impaired autoregulation strategies into a more controlled narrative of the trauma. As the client's initial symptoms of biological arousal diminish, she can begin to systematically arouse herself through her traumatic memories and, with the interactive regulation of the therapist, learn to self-soothe in the wake of her traumatic responses and brief autonomic nervous system responses. As the

client becomes more confident in her ability to self-soothe, she in turn begins to trust herself and increase her sense of safety within the world.

While the client may feel safer in her body after stabilization, until the memory is metabolized it will remain in “unassembled neural disarray” (Siegel, 2010, p. 154). Brain scan research informs us that traumatic memory is encoded primarily as implicit memory: body, sense, and emotional memory. As a result, the survivor must review and process the narrative, thereby linking the sensations, emotions, and memories together to create a coherent whole (Fisher & Ogden, 2009). The work of remembrance and mourning cannot be skipped; there is general agreement in the traumatology community that after safety and stabilization, the trauma itself needs to be confronted (Cloitre et al., 2012). Many trauma therapists describe this phase as exposure treatment or trauma-focused narratives. This can be difficult to help the client engage in, especially for those who are deeply entrenched in the avoidance symptoms of the trauma.

Rachel regained a basic ability to sleep consistently, manage her anxiety with several weeks absent of panic attacks, and a foundational sense of being able to protect herself from internal and external cues of danger. It was time to engage in remembrance and mourning by having Rachel slowly talk through and experience the trauma memory. The plan to process the trauma narrative was explored for several weeks before the work began. Eventually, Rachel made the decision to process the narrative when she was ready.

As the narrative work progressed, Rachel experienced sympathetic arousal, which came in the form of the bodily sensations she had the morning after the rape. Under the guidance of her therapist, Rachel used her safety skills to downregulate her anxiety and engage the parasympathetic branch of her nervous system so as to manage feelings of anxiety. Only when Rachel was safely back in a mind-body level of activation that was tolerable would the narrative progress.

Herman described neural integration as fragmented components that need to be an “organized, detailed, verbal account, oriented in time and historical context” (p. 177). This organized and verbal account allows the survivor to use the left hemisphere of her brain toward logical and linear recall of events, as well as the right side to acknowledge the embodied experience. Additionally, this process permits the lower parts of the brain, including the limbic areas, to move wordless memory toward the frontal executive portion of the brain to make meaning of the event.

If the memory does not include the feelings and sensations of the trauma, then the recollection is “barren and incomplete” (Herman, 1992a, p. 177). Therefore, a client must have the affect tolerance to engage in this kind of therapy (making it imperative for the client to have completed the “safety” portion of Herman’s triphasic model). The client must have a foundational sense of safety and skills to regulate the autonomic nervous system from

sympathetic states of arousal and parasympathetic states of freeze and numbness in response to these implicit memories before engaging in remembrance and mourning.

Using a neurobiological lens, this work can be seen as integrating the explicit self (left hemisphere of the cerebral cortex) with the implicit, bodily based reactions to trauma (right hemisphere of the cerebral cortex). The technique of actually implementing this is different depending on the practitioner's skill set, but examples center around talk therapy, in whatever form feels best for the therapist and client, and is linked with the bodily based therapy that is so common among therapists today. Somatic experiencing (Levin, 1997), the Trauma Resiliency Model (Miller-Karas, 2015), and sensorimotor psychotherapy (Ogden, Minton, & Pain, 2006) are three examples of this kind of intervention.

In recalling the powerlessness, disgust, and terror that accompanied the memories of that night and morning, Rachel began to connect the previously separate and dissociated components of the trauma. Rachel had dismissed the trauma, as had others around her, because she did not have full memory of the events, and yet when she allowed for integration of the wordless components of her experience to integrate with the left brain processes holding the events and timeline of the trauma, she was able to finally understand fully why it had impacted her. As Rachel incorporated her understanding of the trauma, she was then able to release feelings of shame and guilt she had felt for “overreacting” to that night; Rachel understood that it was a human experience she had endured in that her mind and body could not assimilate the events of that night and that she had done her best to cope but needed support and guidance in reassembling the fragmented pieces of the trauma to heal and recover.

It is important to note here that some therapists try to engage the left hemisphere only during this phase. Many common manualized treatment methods that involve cognitively understanding the trauma and the body's reactions are not sufficient to help the traumatized client regain a sense of self. It is the belief of the authors that only treatments that incorporate the dual involvement of the explicit self and the implicit bodily based reactions truly begin to heal the trauma and give the clients the opportunity to rebuild themselves from the outside in. As the survivor constructs the trauma narrative, Herman stated it must become integrated into the survivor's life story. In therapy, this requires an attentive psychotherapist who can observe bodily states while keeping the client's narrative affectively arousing but not to a point of dissociation or flooding the autonomic nervous system. Doing so requires exposing the client to the narrative in a focused way, like a pendulum, moving her away from moments of intense hyperarousal and allowing the client to regulate her affect before returning to the trauma narrative again.

Reconnection

The final stage of Herman's trauma treatment theory is called reconnection. In the stage of reconnection, the survivor reclaims her life and "faces the task of creating a future" (Herman, 1992a, p. 196). Here, the therapist assists the client in learning to notice the ways in which her mind and body have adapted to the trauma and that the old procedural tendencies of safety through extreme biological reactions or maladaptive coping have receded. This can be seen as the final phase of neural integration, now integrating the implicit responses from the trauma to the explicit environment in which the survivor will reengage. By taking risks in the form of new wanted experiences, at a gradual pace that the client feels empowered to control, the client learns that she can tolerate the increase of stress, while simultaneously remaining within her window of tolerance. The therapist supports the client as she "take[s] concrete steps to increase her sense of power and control, to protect herself against future danger, and to deepen her alliances with those whom she has learned to trust" (Herman, 1992a, p. 197).

Rachel returned to work and classes after a leave of absence. While she had accomplished much healing in the first two phases of therapy, reentering her life at the university triggered memories that were previously coupled with the trauma. The smell of her laboratory, the sight of the dorm she awoke in, and interactions with former colleagues evoked autonomic responses that Rachel worked with by using her hard-earned autoregulatory capacities that she had developed throughout treatment. Rachel joined a sexual assault survivor therapy group, and there she took steps to take risks in disclosing her feelings, while simultaneously maintaining an embodied sense of empowerment and control. She also began to experiment with more fluid interpersonal boundaries, while always feeling she had the capacity to protect herself.

During this last phase, the survivor reengages in the external social world and permits others begin to see her, and in turn shape her, into a synthesized being. Herman saw this process beginning in group treatment, but it can also be extended through other social milestones such as dating, reentering the workforce, or other interactive social experiences that were impossible when the client's autonomic nervous system was activated.

Herman's emphasis on integrating the trauma narrative into the context of a survivor's life story is consistent with the field of interpersonal neurobiology and Siegel's (1999) concept of neural integration. That is, the limbic system and prefrontal cortex coordinate to allow the trauma survivor to recreate the trauma narrative that also sheds the autonomic arousal and fear associated with it when it became embedded in the brain (Siegel, 1999). In other words, neural integration is what Siegel refers to as "self-organization" (1999, p. 302) and is essential in creating (or reclaiming) a sense of self after a traumatic

event. “In essence, recovery allows the mind’s self-organizational processes to return the flow of states toward a balance” (Siegel, 2012, p. 288).

Trauma is created in the context of a relationship and must be healed in the context of a relationship. Namely, damage that is done to an individual by another person, such as the assault on Rachel, usually requires a reciprocal healing interaction within another relationship, such as with a therapist. Schore and Schore (2014) describe the healing nature of a therapeutic relationship as “regulated and dysregulated bodily based affects are communicated within an energy-transmitting intersubjective field co-constructed by two individuals that includes not just two minds, but two bodies” (p. 190). Together, in the therapy room, and later in group psychotherapy or reengagement with society, the trauma survivor learns how to trust a relationship again without fearing trauma.

Concluding remarks

Perhaps most striking about Herman’s ideas, and the neurobiological underpinnings that this article has attempted to elucidate, is an emphasis on being human. That is, Herman destigmatized PTSD as a problem with psychological weakness and instead identified it as being “normal” in the wake of terror. The authors believe that adding neurobiology to the understanding of trauma further reduces the stigmatization PTSD for a client who may experience shame over his or her reaction to the trauma. The authors believe adding psychoeducation regarding the neurobiology of trauma humanizes the trauma reaction event more by providing a scientific, etiological, and neurobiological justification of the sequelae. Herman’s triphasic model of healing emphasizes the need for psychotherapy to be trusting and relational, while phasing the therapeutic work so the client can find safety in her body, and incrementally increase the doses of exposure to trauma-related stimuli to gain a sense of mastery and control in her body and to fully transform from the traumatic events.

Implications

To date, there are many different methodologies to treat trauma including, cognitive-behavioral interventions, prolonged exposure therapy, relational psychotherapy, somatically oriented approaches, and psychodynamic treatment. While Herman’s conceptualization of the etiology and symptoms of trauma are generally accepted (Cloitre et al., 2012), treatment interventions vary, and not all are consistent with Herman’s triphasic model. The authors believe that the treatment approaches consistent with Herman’s model and a scientific understanding of autonomic dysregulation offer relational work to stabilize, as well as regulate the implicit, nonverbal right hemisphere reactions to trauma. The

Table 2. Treatment.

	Phase 1: Safety	Phase 2: Remembrance and Mourning	Phase 3: Reconnection
Herman's language	<i>The therapist and client must engage in a dance of developing trust and rapport while simultaneously working toward skill building. Herman sees the primary role of the therapist as an "ally and witness" in this phase (p. 123).</i>	If the memory does not include the feelings and sensations of the trauma, then the recollection is "barren and incomplete" (Herman, 1992a, p. 177).	The survivor "faces the task of creating a future". (Herman, 1992a, p. 196).
Common interventions	Breath work, mindfulness interventions, yoga, relaxation, and stress reduction strategies that engage the body. Mindfulness modules from dialectical and behavioral therapy (DBT). Somatic experiencing (SE) and sensorimotor psychotherapy (SP) also helpful in this phase.	Trauma narrative work. Some common manual therapies for this phase include prolonged exposure (PI), cognitive processing therapy (CPT), and eye movement and desensitization therapy (EMDR). SE and SP also used in this phase. Trauma resiliencing model (TRM).	Returning to work life; starting to date again; starting group therapy after intensive individual psychotherapy. Reengaging in activities that were "normal" before the trauma.
Neurobiological Conceptualizations	Engaging the parasympathetic branch of the nervous system.	Achieving "neural integration". Linking the trauma's sequential events (left hemisphere) narrative with the embodied (implicit, right hemisphere) limbic memories to make meaning and regain control of the remembered traumatic event.	Achieving neuroplasticity by integrating implicit (nonverbal, amygdala) responses to have prefrontal cortex control and appraisal.

integration of Herman's model and contemporary trauma treatment approaches is illustrated in Table 2. As trauma practitioners look to the future of trauma treatment, the authors are hopeful that teaching new clinicians modern-day regulation theory and the importance of interpersonal neurobiology regardless of theoretical orientation will be embraced. The benefit of engaging the trauma survivor in a dyadic therapeutic relationship that can help her feel safe, remember the trauma, mourn the loss, and reconnect with herself, and the world is great. The authors believe that these tasks take primacy over nonrelational interventions such as homework assignments and treatment manuals. Without these essential ingredients in trauma treatment, eloquently described by Judith Herman, clients may be left in a state of perpetual, dysregulated terror.

Research

The authors would like to acknowledge the body of work of prolonged exposure therapy (Foa, Hembree, & Rothbaum, 2007) and that it continues to be the gold standard for empirically validated treatment of PTSD. Exposure treatment intervention is distinct from the phasic and interpersonally attuned approach submitted by the authors. We hypothesize that clinical research using Herman's model within a neurobiological context would yield strong treatment efficacy with low dropout rates due to incrementally increased exposure to stressors, allowing the client to feel more empowered and in control. Contrasting from a model of fear activation and extinction, this model addresses avoidance and numbing symptoms through interpersonal attunement and education on how to address symptom activation incrementally. Promising areas of research that support incremental trauma treatment coupled with relational psychotherapy include a recent study by Markowitz et al. (2015) on the efficacy of interpersonal psychotherapy on PTSD symptoms as comparable to prolonged exposure therapy.

Recommendations for practitioners

Since her book was published, Herman has been an active contributor to trauma theories and debates and served as a recent and notable voice on the DSM 5's omission of including her theory of complex PTSD to separate traditional PTSD from a diagnosis of survivors who have experienced prolonged and repeated trauma (Herman, 1992b, 2012). Herman argues that every survivor must be treated in the context of their injury and not with an oversimplified view of PTSD. With this in mind, the authors believe no single treatment plan will help all trauma survivors recover in the same way, yet therapists are well advised to consider the following foundational elements of Herman's work as informed by neuroscience:

- Trauma that occurs in relationship must heal in relationship.
 - The consultation room is where safety is gained incrementally and the therapist's task is to attend to safety first and throughout treatment.
- Trauma processing can only occur once basic safety and self-regulatory capacities have been attained.
 - Neurological structures in the brain are impacted by the trauma (i.e., the amygdala is activated for a fight, flight, or freeze response). Processing too soon can flood the client, dysregulating the autonomic nervous system further, and perhaps exacerbate (or reenact) trauma symptomology.

- As the mind and body reregulate, the therapist acts as a bridge, helping the client regain safety in the world, testing each new social situation, with the anchor of safety in the consultation room.
- The final step for trauma treatment is often the reengaging with the outer world that the trauma has incapacitated. This can be in the form of vocational reentry, psychotherapy group treatment, or similar modalities.

No matter what modality the clinician is trained to use during trauma work, Herman's essential concepts provide scaffolding to all trauma interventions.

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