

A Description of the Six Stages of the Shutdown Dissociation Continuum Associated with Complex Trauma. Introduction of a Novel Model of Dissociation to Assist with Treatment Planning. Use of Sensorimotor-Focused EMDR to Achieve Resolution of Symptoms of Dissociation Associated with Hyper and Hypoarousal

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Abstract

This article explains the six stages of the shutdown dissociation continuum that involves progressive activation of the sympathetic and parasympathetic system. To explain this process the analogy of an attack by a safari lion is used. The Shut-D dissociation scale has been developed based on the defence cascade model. The stages include: avoidance, attentive immobility, flight, fight, tonic immobility and feigned death from vasovagal collapse. The Shut-D questionnaire is included for use by practitioners who are dealing with patients with dissociative symptoms of complex Post-Traumatic Stress Disorder or PTSD. This is important in terms of treatment planning. Dr O'Malley reintroduces readers to his model of dissociation from O'Malley 2016 which is supplemented with the use of a three dimensional model of dissociation. This is particularly useful to explain this symptom constellation to children and adolescents and patients on the autism spectrum.

Introduction to the Shutdown Dissociation Continuum

The Shutdown Dissociation Scale (Shut-D) was first developed by Schaer and Elbert [1] in an effort to allow documentation of the symptoms of derealisation and depersonalization associated with patients with dissociative symptoms. It is assumed that the survival advantage of the shutdown continuum is to inhibit actions, which may threaten survival and stimulate actions that promote survival when in a life threatening situation. Its use was reported by Schalinski.

These symptoms arise from the shutting down of emotional, cognitive, sensory and other behavioural responses that would otherwise lessen the survival prospect in the face of overwhelming threat. The following are the 6 stages of dissociative shutdown:

1. Avoidance

The first response to threat is avoidance in the first place. However in situations of sexual abuse, war, torture or terrorist attacks this is rarely possible.

2. Freeze

Secondly Freeze occurs due to sympathetic stimulation and attentive immobility.

The person is Immobile but attentive (Initial orienting response to danger). The client/patient is silent, paralyzed with frozen defensive responses. Their heart

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rate, pulse and blood pressure are increased so that they are in a state of readiness to act.

Analogy

Dr. Chris Gantor [2] an Australian psychiatrist describes an evolutionary perspective on trauma. His view is that humans deploy mammalian defence strategies when faced with unsafe and life threatening situations. For example if on a safari and you see a lion 200 meters away, you carefully take backward steps to return to your vehicle or jeep or attempt to blend in with the surroundings. These are attempts to remain as motionless as an inanimate object. This shifts the lion's attention to other moving or noisy stimuli. Of note this often is the beginning of speechless terror, which can become a feature of unresolved trauma. At the point of heightened awareness the blood flow is diverted away from the left cerebral cortex and prefrontal cortex and towards the major organs i.e. guts heart and lungs.

A patient described how his heart rate increased as he started to remember the events of years ago in relation to his pet dog. A car had hit the dog and he was powerless to help. This was a natural first part of the survival response. This memory became reactivated during the therapeutic session and needed to be reprocessed. His initially speechless terror was resolved as the traumatic memory was resolved.

Another patient described an encounter with a frog, pet cat and dog on the stairs of her family home. At the time she experienced overwhelming anxiety and increased heart rate when confronted by the conflicting demands of holding onto her dog at the bottom of the stairs, being frozen to the spot with the thought that the cat might attack the frog and finally being repulsed by the sight of the frog which appeared to be watching her. This was linked to her unconscious memories of running into a flock of frogs crossing the road and possibly related to memories of her former cat being killed by a car. She described how previously 'Kamikaze sheep' jumped onto the bonnet of her car. These previous memories emerged by floating back to a first or worst time when she felt in a similar life threatening experience. This was dealt with using the three stages of trauma recovery:

1. Safety and stabilization: overcoming dysregulation.
2. Coming to terms with traumatic memories.
3. Integrated understanding of self, which can move on around a healthy present and healed self.

The Next Stages of the Shutdown Dissociation Response are:

3. Flight

This involves escaping from the dangerous situation. During the 9:11 attack in September 2001 survivors talked about running for miles and miles without any conscious awareness of where they were going until exhaustion brought them to a halt. In such a life threatening situation the body will mobilise all available resources such as adrenaline cortisol enkephalins and endorphins to inhibit pain and initiate muscle contractility to put as much distance between the person and the apparent threat.

4. Fight

This involves an aggressive response to stay put and prepare to defend oneself. This response is most likely when the person is cornered and all escape routes are blocked.

The person initiates their active defensive response by activation of the sympathetic branch of the autonomic nervous system, causing a range of flight and fight responses. Both these stages can occur simultaneously and may involve the following:

a) An increase in heart rate, blood pressure increases and deeper breathing.

b) Sweating which cools the body and leads to moist palms. This improves the grip if the person decides to flee through the undergrowth and lessens the chance of injury from twigs and branches etc.

c) The thalamus acts as a sensory gateway after a traumatic event deciding what information is eventually transferred to the cerebral cortex. As it becomes activated in this role, resources are diverted away from the cerebral cortex so that the hypothalamus can act on the pituitary, which stimulates the adrenal glands to release adrenaline into the bloodstream. This explains why Cognitive Behavior Therapy or CBT is unable to access thalamically stored information in the immediate aftermath of a potentially life threatening traumatic experience. It provides evidence for the effect of buzzers placed on the abdomen, renal and other affected body areas during Sensorimotor Focused EMDR: A New Paradigm for Psychotherapy and Peak Performance [3].

d) The heart and musculoskeletal system become energized via increased blood flow for the person to make a snap

decision to take flight or to fight the oncoming danger. Delaying for enough time to think about a response (500 ms) could mean being devoured by the lion. Thus the prefrontal cortex goes off line to allow more rapid brainstem reflexes to become recruited. This involves the hardwired part of our primitive reptilian brain. Reptilio is derived from the Latin meaning, 'To crawl'.

e) The peripheral vascular system (i.e., peripheral blood vessels) constricts to reduce potential blood loss in event of an injury from the marauding lion. This can lead to the person entering the FROZEN in FEAR state of hypoaousal described below.

f) If the person is injured by the lion the peripheral pain receptors (responsible for nociception) shut down. This prevents the person from engaging in premature recuperative behaviour, which could impede healing, and recovery. Any effort at this stage by the person to resist the lion's clutches could lead to death from the lion's instinctive attack.

g) Thinking is limited during this stage of the dissociative process. Any delay in the person's instinctive reaction could be fatal. It takes 40 ms for the muscles to be activated by brainstem control or synaptic reflexes. It takes 500 ms for a thought to be generated in the cerebral cortex. Thus to delay ½ sec or 500 ms to make a decision consciously could be fatal in the scenario outlined. This physiological response explains why at the point of overwhelming trauma the information is stored primarily in the body and brainstem as discussed by Dr Bessel van der Kolk in his seminal work, "The body keeps the score", from 1994.

h) I have described a novel way to titrate this information into the Ventromedial Prefrontal Cortex or VMPFC and onto the Prefrontal Cortex (PFC) where the patient can think about and learn from the event. In my clinical experience it is only at this stage of trauma recovery that a trauma focused cognitive approach can be most effective.

i) RAPIDS: reactive or racing thoughts, affective dysregulation, partitioned personality, intrusive imagery, impulsive or high-risk behaviour, dissociative, self-harm and suicidal ideation. My symbolism of the RAPIDS acronym represents Hyperarousal with dissociation.

Analogy

During this split or half second the person may have become the lion's lunch. This has happened in a recent safari in South Africa. The victim was photographed seconds before death. They were attempting to take a picture of the lion from the open window of their vehicle when the lion pounced on what would have seemed to be prey. As the victim delayed taking the picture the lion pounced and the lion driven by its predatory instincts killed the tourist.

5. Tonic Immobility is a Further Stage in the Dissociative Spectrum of Symptoms

The person is unable to move or respond. This increases their survival chances even when the lion has attacked. Any movements made now could act as a stimulus for the lion to continue their attack more ferociously. The lion could perceive this movement as a threat to their own survival. Thus it is very dangerous if the prey or victim fights back. This stage of the autonomic response involves the activation of the parasympathetic system and especially the dorsal vagal nerve, causing a range of instinctive responses.

a) Immobility of the victim helps avoid tissue damage when threatened with sharp objects or when penetrated. This has relevance for a victim raped at knife or gunpoint.

b) If the victim signals to the attacker, "I surrender" this may prevent any cues for counter aggression by the assailant.

c) Anger is suppressed and the victim experiences emotional numbness. This is a parasympathetic response mediated by the dorsal branch of the vagus nerve. In my three dimensional model below I describe this as: Freeze Reaction, Oblivious, Zonked out, Emotions Numbed, Feigned death, Entrapped, Anguish and Rigidity (using the acronym FROZEN in FEAR).

d) There is an increase in the production of endorphins and enkephalins by the victim to diminish the physical pain. Aggressive and defensive reactions are also inhibited.

e) Blood flow is directed away from Broca's and Wernicke's areas in the Left cerebral cortex. Thus the patient often can't speak about the experience either at the time or subsequently. This is an adaptive survival strategy as any noise could threaten survival chances. Following the

trauma the patient may be unable to speak about the event and in my clinical experience describe feeling a lump in their throat. This has been described as speechless terror and is maladaptive and counterproductive in achieving recovery from the trauma. In therapeutic sessions using Sensorimotor Focused Eye Movement Desensitization Reprocessing or EMDR [3] when this occurs the buzzers are placed either side of the throat until the blood flow is encouraged to flow along the neck, veins and arteries. Invariably this allows the muscles of the vocal chords to function and for speech to return. In my clinical experience of over 200 patients they report that the lump in their throat has disappeared.

Assessing the Level of Dissociation in your Patient or Client and Deciding on a Therapeutic Approach

The Dissociative Experiences Scale or DES [4] was developed as a tool to assess dissociative symptoms in the general population. It doesn't allow for interaction with the client by the therapist, as it is a self-rating scale. The scale illustrated below is much more interactive and helps to pick up dissociative disorders such as nonepileptic attack disorder and other types of conversion disorders. The patient can experience either predominantly hyperarousal or hypoarousal symptoms associated with their dissociative experiences.

There is now widespread acknowledgement that dissociation with predominance of hyperarousal or hypoarousal symptoms require different therapeutic approaches. In my opinion treatment approaches and case formulation should be discussed in clinical supervision with a psychotherapist experienced in the clinical management of primary secondary and tertiary dissociation as outlined by Van der Hart Nijenhuis and Steele.

The Shut-D scale below has proved to be a satisfactory way to quantify dissociative symptoms in patients. There were 4 different samples recruited for this study:

1. The subjects recruited for the study were female refugees with multiple traumatic experiences from the University refugee clinic.
2. This included German psychiatric patients and healthy controls.
3. Another 130 patients were recruited from inpatients at a psychiatric hospital in Germany.

4. Additionally 15 female patients with Dissociative Identity Disorder (DID) were recruited from psychiatric outpatient departments and from private practitioners.

Results

All items on the Shut-D scale were found to be significantly correlated with dissociative symptoms.

This scale applies to multicultural populations of differing education and income including migrants and populations with various psychiatric disorders including;

Acute and complex PTSD, Developmental Trauma disorder, Depression, Psychosis, Borderline and other Personality Disorders and Dissociative Identity Disorder. The authors of the article on development of the Shut-D questionnaire state that,

“First, disruption of the person's normal on-going perceptual and behavioural processes provides the basis for the Shutdown Dissociation response and this interferes with an integrative representation of the environment and the self. It is likely that this on-going disruption of integrative processes would play a key role in the development and maintenance of PTSD.”

6. Collapse, fall and Feigned Death are the Final Stages or End Points of the Dissociative Continuum

The sixth and final part of the shutdown continuum involves feigned death, fall, faint, vaso vagal collapse, Non-Epileptic Attack Disorder (NEAD or pseudo seizures) and fawn or an excessive desire to please. This involves some or all of the following:

a) Repeated activation of the parasympathetic system activates the dorsal part of the vagus in the reptilian brain. This comes from the Latin 'Reptilio' which means to crawl. Blood pressure is lowered in case the victim's skin and muscle tissue are damaged. This is a good survival strategy as potential blood loss is minimized. There is recent evidence that reptiles like the Bearded Dragon are capable of imitative behaviour [5]. This offers new potential for helping patients to reprocess brainstem-based behaviour during Sensorimotor Focused EMDR for psychotherapy, which focuses on brainstem responses linking somatic experience with thoughts, feelings, sensations and emotions.

b) When the victim is crawling or prostrate, like a reptile, oxygen and essential nutrients are carried by the circulatory system to the essential organs namely Gutbrain,

Table 1: Shut-D Dissociation Scale

| Items in Shutdown dissociation scale (score) | Zero | One | Two | Three |
|--|-----------------------|-----------------------|----------------------------|-------|
| Not at all | </ = Once per week | 2-4 times per week | ➤ Or = 5 times per week | |
| 1. Have you fainted or been passing out? | | | | |
| 2. Have you felt dizzy Has your vision gone black. Have you felt dizzy and couldn't see anymore as if you had gone blind? | | | | |
| 3. Have you felt as though you couldn't hear for a while as though you were deaf? When people were talking to you, did they sound far away? | | | | |
| 4. Have you had an experience of not being able to properly see things around you? (e.g. Blurred vision) | | | | |
| 5. Have you felt as though your body or a part of your body has gone numb? | | | | |
| 6. Have you felt as though you couldn't move for a while, as though you were paralyzed? | | | | |
| 7. Have you felt as though your body or a part of it was insensitive to pain? (analgesia) | | | | |
| 8. Have you ever been in a state in which your body suddenly felt heavy and tired? | | | | |
| 9. Have you ever experienced your body becoming tense or rigid for a while? | | | | |
| 10. Have you felt sick or nauseous? Have you felt as though you were about to throw up or vomit? Have you felt yourself break out in a cold sweat? | | | | |
| 11. Have you ever had an out-of-body sensation? Have you ever felt as though you were outside of your body? | | | | |
| 12. Have you had moments when you have found yourself unable to speak? Have there been occasions when you could only speak with great effort? Have there been occasions when you could only speak in a whisper for a period of time/ | | | | |
| 13. Have you ever suddenly felt weak and warm? | | | | |
| Total score Max 39 around 20 implies highly significant symptoms of dissociation to be considered in planning treatment | | | | |

Heartbrain and Headbrain. Sensorimotor Focused EMDR for psychotherapy is uniquely placed as an integrative approach to allow reprocessing at all these levels.

c) The vagal stimulation of the heart reduces heart rate. Circulation and metabolism is maintained. This is again an instinctive survival strategy. When age 9 I was standing at an open kitchen door leading to a hallway. In an instant I was prostate with hands outstretched to break my fall. I

adopted a reptilian or crawling posture instinctively. A split second later there was a massive explosion from a rocket attack launched by the Irish Republican Army (IRA) at the joint British Army Royal Ulster Constabulary (RUC) military base in my hometown of Newtownhamilton South Armagh, Northern Ireland. This was 100 m away from our family home. Reflecting on this event over the years since I studied medicine and neuroanatomy in particular I came to the following conclusion. The sound wave of

the explosion was initially processed by my autonomic nervous system probably by peripheral proprioceptors. All my sensory receptors conveyed information to the brainstem and thalamus and this was interpreted as life threatening. Within milliseconds the thalamus sent effector responses to my musculature activating the reptilian posture response. Between 100 and 500 ms later my auditory (eighth cranial) nerve processed the sound of the explosion namely breaking glass and falling masonry. Only then did I become consciously aware of my environment. My key organs of the heart lungs and gastrointestinal system had been instinctively protected by my instinctive brainstem call to action of the skeletomusculature. As I was only 9 my Default Mode Network (DMN) was in the early stages of development. It is following life threatening traumatic experiences like this that your destiny and fate can be decided. Thankfully neither I nor any members of my family were physically injured by this explosion, which took place in Newtownhamilton Co Armagh Northern Ireland in 1971. However our town in what was known at the time as 'Bandit country' went on to experience over 40 more terrorist incidents in the conflict known as "The Troubles." It is for this reason I left Northern Ireland to study medicine in Trinity College Dublin and my interest in the neurobiology of trauma was kindled.

d) If the assailant tortures the victim with e.g. water boarding or contamination such as cyanide or radiation poisoning, cortisol is released as adreno corticoid and mineralo corticoid. This can help to protect the heart and any subsequent stress reaction.

e) The victim releases their own analgesia in the form of endogenous opioids to aid survival until hopefully help arrives.

f) All emotions are numbed (FROZEN in FEAR). This helps to inhibit an emotional reaction, which may threaten survival. In particular a person being raped at gunpoint could be killed if they called out for help. Thus 'speechless terror' has evolved as an evolutionary survival strategy preserving the transmission of genes to the next generation.

g) An excessive frozen reaction can lead to dissociative subtype PTSD if not adequately addressed.

h) To aid survival all physiological arousal mechanism and memories of the incident can be repressed. In therapy the goal is to bring these unconscious memories back

into conscious awareness. This can be achieved using SF-EMDR as outlined in my book to be published by Routledge in Dec 2018.

My model of this spectrum of autonomic arousal in the wake of trauma is designed to embody these dissociative emotional states and contain them initially in the prism of the NARROW WATER CASTLE. The next step is converting them from gutbrain to heartbrain reprocessing. Finally activation at a gamma wave frequency of 40 Hertz can help to reverse thalamic activation so that thalamocortical binding can occur. Further activation into the headbrain allows computing at the level of the cerebral cortex and specifically the prefrontal cortex. This stabilizes the client or patient's level of arousal. Once in their optimal arousal zone, they can tolerate feelings and associated reactions. They can start to reflect and learn from previous experiences. They can think and feel integratively and their reactions adaptively fit the imagined or recalled situation. Dissociative responses help the victim to survive during their life threatening event but if continued lead to inability to reintegrate past memories and fragmentation of future experiences which are not adequately stored in long term memory. It is as if the thalamus as our sensory gateway is on high alert. It keeps triggering a survival response and no information enters the cerebrum. This would take 500 ms: time the thalamus believes it doesn't have. The patient or client is unable to think due to dissociation. They have disabled defensive responses and collapse physically and mentally into a helpless and hopeless state. It is difficult to tolerate this affect and the client or patient may engage in self-harm to attempt to feel normal again. Instead of reaching a sense of CALM WATERS (Consciously aware, Level-headed, Mindful Window of affect tolerance and emotional regulation and stability), they are likely to overshoot their window of tolerance or optimal arousal zone. This brings them into the RAPIDS as described below.

The NARROW WATER CASTLE can become a metaphor for containing difficult emotions and feelings until they are tolerated and the client or patient is aware of a sense of calm and a burden being lifted from their shoulders.

For patients especially children who have difficulty with this two dimensional concept of dissociation, I have developed a three-dimensional model based on the Narrow Water Castle built in Elizabethan times at the Burren outside Warrenpoint Co. Down Northern Ireland. Figure 2

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Figure 1: Dissociation model of RAPIDS, CALM WATERS and FROZEN emotional states by O'Malley Revised in 2018 from original in 2011
RAPIDS Racing thoughts Affective dysregulation Partitioned personality Impulsivity Distress Suicidality

A. Hyperarousal and Dissociation



CALM WATERS Consciously Aware Level headed Mindful Window of Affect Tolerance Emotions Regulated and Stabilised

B. Integration of Affective States



FROZEN in FEAR Freeze Reaction Oblivious to the outside world Zoned out Emotionally Numb Feigned death Entrapped Anguish Rigidity

C. Hypoarousal and Dissociation



Figure 2: Sign for the actual Narrow Water Castle built in Elizabethan times



I have developed the following acronym to explain to patients the goals and processes involved in SENSORIMOTOR FOCUSED EMDR for psychotherapy.

Nerves
 Are activated
 Repeatedly
 Rewiring and
 Opening the
 Width of the
 Window of
 Affect
 Tolerance and
 Emotional
 Regulation
 Containing
 Any
 Significant or
 Traumatic
 Life
 Events

In my clinical experience this model works very well with patients with complex trauma such as dissociative identity disorders. Many patients have drawings or soft toys, which they use to represent different aspects of their partitioned personality. When traumatic events happen, the personality fragments in a characteristic way according to Van der Hart, Nijenhuis and Steele [6]. Table 2, Figure 6

Figure 3: This is an overview of the model of the NARROW WATER CASTLE showing the RAPIDS on one side and the FROZEN lake on the other. It is set on the background of garden paving slabs to give a perspective in relation to the actual model size. The model has a customized wooden cover, which locks, into place with clips. This allows for portability and the model is reinforced with metal brackets for durability and protection. I believe this model could be replicated for Practitioners to use with dissociated clients. This would be especially helpful for working with children, adolescents and patients with autism and Asperger's syndrome. In my clinical experience these patients respond well to information that can easily processed visually. The presence of the castle acts both as a safe place and as an area where conflicts can be resolved. It is also possible to use this structure to reintegrate compartmentalized aspects of the patient's dissociated personality. In my clinical practice the emphasis is on reintegration of parts to the state that existed in the pretraumatic personality. It is important to do this in the context of a secure therapist - patient relationship



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Table 2: Model of Fragmenting of Apparently Normal Personality after Repeated Traumatic Events

| | | | |
|--------|-----------------------------|----------------------|--|
| | | Apparently | |
| | | Normal | |
| | | Personality | |
| | Left Brain | | Right Brain stores |
| | carries on with | | traumatic memories & |
| | “Normal Life” | | survival responses |
| | | | elicited at that time |
| | This fragments into further | | Fight |
| | | | |
| | compartments designed to | | Flight |
| | | | |
| | hold resources | | Fright |
| | and can act as | | Freeze |
| | target for building | | Feigned death |
| | resilience | | Fall |
| | | | Submit |
| Worker | Selfcare | Social relationships | Attach |
| | | | These are all different survival strategies needed in a world perceived as dangerous |

Figure 6: This shows a way out from the state of dissociative hypoarousal. Various types of imaginative play can help the child to use their resources such as superheroes to airlift them to the castle as a place of safety. The spirals on the door can also be used to activate a magical kingdom such as that of the wizard Merlin, authors Roald Dahl, Walt Disney, JK Rowling etc



Discussion

There has been an explosion of research into the effects of early trauma and deprivation on human development. Editors Charles Zeanah and Edmund Sonuga-Barke characterize this as a move towards understanding developmental mechanisms. Teicher and Samson [7] suggest that different forms of abuse can affect specific regions of the brain. This has been reported in Kennedy, et al. [8] in a 25-year follow to the English and Romanian Adoptees Study [9]. Impaired Attention Deficit Hyperactivity Disorder or ADHD symptoms persist in this group. fMRI studies are demonstrating under-activation of brain circuits such as the Default Mode Network (DMN). A study of young children exposed to war trauma found high levels of PTSD, anxiety and disruptive behavior disorders and ADHD [10]. To date this research has not yet translated to a change in clinical practice in Child and Mental Health Services (CAMHS) especially in the UK. Here the emphasis is on treating symptoms with medications such as antidepressants and stimulants as the primary intervention. An exploration and focus on the management of traumatic stress and dissociation would dramatically decrease the need for medication.

Mc Gorry, et al. [11] reported on the latest fMRI literature in relation to threat and reward processing, emotional regulation and executive control. The conclusions and implications for clinical practice of this research are profound. They found that maltreatment in childhood led to future mental health problems by altering neurocognitive functioning. These neurocognitive alterations appear to be adaptive at the time of the adversity but contribute to the pathogenesis of mental health disorders in adolescence and adulthood. The mechanism appears to be that latent vulnerability is the neurocognitive phenotype. The child experiences indirect cumulative effects and direct immediate effects. This impact on socio-emotional functioning. Exposure to later stressors then leads to a heightened risk of developing chronic and enduring psychiatric disorders. In my opinion what is needed in CAMHS is a paradigm shift from an emphasis on the treatment of symptom suppression with medication to embrace the emerging field of preventive psychiatry.

Conclusion

Trauma survivors with autonomic shutdown and dissociation symptoms or dissociative identity disorder require different treatment to classical exposure based approaches. The Shut-D scale will enable therapists

to systematically document the impact of traumatic experiences on victims where they have been exposed to a high proximity to danger such as sexual assault. This is especially relevant to the dissociative subtype of PTSD in DSM V. This will also be relevant when ICD 11 is published in 2018. This is expected to incorporate diagnostic criteria for complex PTSD. This research paves the way for innovative treatment strategies for dissociative symptoms in trauma victims. I have introduced a novel model to explain the altered levels of arousal in complex trauma. This can assist with treatment planning in combination with Sensorimotor Focused EMDR: A New Paradigm for Psychotherapy and Peak Performance [3]. The article concludes with reference to the dissociative subtype of PTSD in the Diagnostic and Statistics Manual Version V, DSM V [12]. The outcomes for treatment of dissociation in complex PTSD will be enhanced by explaining this model to patients and clients.

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