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Karl Yngvar Dale

Traumatic stress, personality  
and psychobiological health :  
conceptualizations and  
research findings



Høgskolen i Molde  
Vitenskapelig høgskole i logistikk



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- conceptualizations and research findings.**

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## Introduction

You can hardly develop as a person without going through some hardships, and as the saying goes: what doesn't break you makes you stronger. But on the other hand, how much can you take before you break? And what is it that breaks you? And how does it affect you, biologically, psychologically, socially, and as a person? Lastly, what are the chances of being repaired?

According to attachment theory and various developmental perspectives (Robrecht, 1994; Jackson, Born, & Jacob, 1997) it is necessary to be exposed to psychological, social and physical hardships throughout life in order to develop emotionally and cognitively as an individual. However, it is essential that the changes we endure, the challenges we meet, and the stress-experiences we are exposed to, are continuously processed and integrated. In this manner we can keep the balance and experience ourselves in the centre of circumstances.

Our development may be critically disrupted because of psychological trauma. This is a type of damage to the psyche that occurs as a result of a traumatic event. A traumatic event involves an event that completely overwhelms the individual's ability to cope or integrate the ideas and emotions involved. Trauma can be caused by a wide variety of events, but there are a few common aspects. There is frequently a violation of the person's assumptions about how the world works and about how people act. In other words, the traumatized person is set in a state of extreme confusion, insecurity and disbelief.

Psychological trauma may accompany physical trauma or exist independently of it. Typical causes

of psychological trauma are sexual abuse, violence, the threat of either, or the witnessing of either, particularly in childhood. Catastrophic events such as earthquakes and volcanic eruptions, or war can also cause psychological trauma (Weiseth, & Mehlum, 1993).

Different people will react differently to similar events. One person may experience an event as traumatic while another person would not suffer the full spectrum of trauma related symptoms as a result of the same event. This implies that people are different in terms of how they tackle stress and overwhelming experiences – they are differently equipped, both emotionally and cognitively, and they have different coping strategies during stress, as well as having different resources to bear on after traumatic stress incidents have occurred (van der Kolk, McFarlane, & Weisaet, 1996).

Individuals who have had the opportunity to develop wholly through a diverse life, are characterized by experiences of being in control and of being in balance with their environment and their own body and emotions. Traumatized individuals, on the other hand, are characterized with partly, or totally, lacking these qualities:

- they experience to be out of balance with themselves (who am I; what do I want)
- they are out of balance with their unconscious mind (as seen in obsessive-compulsiveness and derealisation,
- they have problems with remembering their past (e.g. what happened during an abuse episode or at their first day at school)
- they endure that their body “works against them” or follows its own rules, and
- they endure all sorts of physical pain and paralyses that cannot be explained medically (van der Kolk, 1997).

In addition they have great problems in adjusting to the life rhythms and needs of others, for example their needs for emotional contact. These problems can be categorized as *posttraumatic stress* and reflect both an alienation from self, others and bodily functions and fragmentations in consciousness. Higher degrees of growth inhibiting emo-

tional distress, resulting from childhood abuse, combat trauma or torture, are associated with higher degrees of posttraumatic stress. In the following it will be explored how this cluster of symptoms has been conceptualized throughout history. Furthermore, it will be outlined a comprehensive overview of research aiming to capture the connections between traumatic stress, personality and psychobiological health.

### Early conceptualizations of trauma

By the end of the 19<sup>th</sup> century a series of clinicians and theoreticians, like Charcot, Janet, and James, argued that serious psychological instability during adulthood could be traced back to different forms of traumatization in childhood. So called “hysterical” conditions inspired the great theoreticians of the epoch to elaborate on models in which so-called mental and somatic factors were intimately connected, or conceptualized as different aspects of a unit (see e.g. Spitzer, Freyberger, & Kessler, 1996).

In *L'Automatisme Psychologique* from 1889, Janet maintained that dissociative symptoms are often induced by psychological trauma, severe illness, or fatigue. Subjects who are exposed to these events may fail to integrate their experiences and reactions, which are instead stored as dissociated “systems of ideas and functions.” These systems are totally or partially inaccessible to normal awareness, operate independently of voluntary control, and may include somatoform components of experience, reactions and functions. Janet observed that the capacity to integrate was severely diminished among patients suffering from hysteria. He also discovered that most of them suffered from unresolved and therefore, dissociated traumatic memories. Janet stated that these cases reflected what he labeled *psychological automatism* – a state where consciousness did not belong to the personal consciousness, and was not connected to the personal perception, or sense of self. The dissociated consciousness existed rather at a subconscious level.

Psychological automatism could manifest itself either totally or partially. In both total and partial automatism there exist subconscious psychological subsystems of fixed ideas and functions which have escaped personal control and perception. These dissociated systems are isolated from the personal consciousness.

In his early years, Sigmund Freud shared the traumatological perspective advocated by Charcot and Janet, but for different reasons he changed his position on these issues in 1897 (Ellenberge, 1970; Brown, Macmillan, Meares, & Van der Hart, 1996). He refuted the so-called “seduction”-theory and introduced a new theory where sexual fantasies were regarded as the cause of neuroticism. This might be considered as one of the most fatal shifts in perspective in modern psychiatry since the place of trauma was not re-conceptualized in Freud's new theory; it remained without articulation. Hence, trauma was marginalized as a phenomenon in psychoanalyses because of this change in perspective, and due to the rising popularity of psychoanalyses throughout the twentieth century, the significance of sexual abuse was given little attention in clinical practice. Some might say that the trauma-perspective went into a near fifty year hibernation (Ross, 1989).

### Trauma revisited: PTSD and dissociation

In the aftermath of the world wars, and not at least the Vietnam war, there has been a growing focus on the psychological consequences of experiencing extreme events, such as natural disasters, warfare and serious accidents (Kardiner, 1941; APA, 1994; van der Kolk, Herron, & Hostetler, 1994). Furthermore, clinical observations within a series of populations, both civilian and military, have eventually been comprised in the diagnosis of posttraumatic stress disorder, or PTSD (APA, 1994).

A clearer understanding of how adults handle traumatizing events, evidently paved the way for the rediscovery of childhood trauma. Through the

sixties and seventies it became more legitimate to deal with these issues, both in the therapy room and as societal phenomena (van der Kolk, Herron, & Hostetler, 1994).

Throughout the twentieth century trauma-related phenomena have been dealt with along separate lines. On the one hand, we find the tradition which deals in general with traumatic stress and stress-reactions within the realm of posttraumatic stress disorder (van der Kolk, McFarlane, & Weisaet, 1996). On the other, there has emerged a tradition which focuses mainly on the dissociative symptoms of PTSD (Chu & Dill, 1990; Putnam, 1995; Ross, 1989; Schumaker, 1991; Vanderlinden, Van Dyck, Vendereyken, & Vertommen, 1991). Only in the past two decades there has emerged a tradition which seeks to integrate all aspects of traumatic stress - that is bodily, cognitive, behavioral and emotional symptoms - into a comprehensive model (van der Kolk, Herron, & Hostetler, 1994).

PTSD is an anxiety disorder that has been estimated to affect between 15 to 24 percent of individuals who are exposed to traumatic events. It is significant that (a) not all individuals exposed to traumatic events develop PTSD symptoms and (b) women are twice as likely as men to develop PTSD. For PTSD to occur, an individual must have experienced the traumatic event in a way that involves “intense fear, helplessness or horror”.

PTSD is the psychological and psychophysiological reaction to experiencing events that are outside the range of usual human experiences. Such events may include accidents, natural disasters, man-made disasters, military combat, war, motor vehicle accidents, violent crime, rape, sexual assault, and/or any other unusually violent event.

There are three main types of PTSD symptoms: (a) re-experiencing the trauma – for example nightmares or intrusive thoughts, (b) avoidance and numbing, for example memory loss or feeling unable to love, and (c) increased arousal, for example difficulty sleeping or hypervigilance. The most disruptive symptoms of PTSD involve intru-

sive memories of the traumatic event, bad dreams about the traumatic event, flashbacks or a sense of reliving the event, feelings of intense distress when reminded of the trauma, and physiological stress response to reminders of the event (pounding heart, rapid breathing, nausea, muscle tension, sweating)

Dissociation is regarded as a complex psychopathological process that occurs on a continuum ranging from minor normative dissociation, such as e.g. daydreaming, to psychiatric conditions, such as Dissociative Identity Disorder (DID; APA, 1994), which is the most pathological type of dissociation. DID is conceptualized as a disturbance in the integrative functions of identity, memory and consciousness and contains five core symptoms, i.e. 1) amnesia, 2) depersonalization, 3) derealization, 4) identity confusion, and 5) identity alteration. All these five symptoms are required to set the diagnosis of DID, formerly labeled multiple personality disorder. DID is also characterized by the presence of two or more separate identities, each with their own name, behavior pattern and sense of reality.

Concepts within the “dissociation” approach have met a lot of resistance, particularly because of the phenomenon of DID (Cohen, Berzoff, & Elin, 1995). However, allegations of DID not being a real disorder have been refuted through more precise conceptualizations and through more clinical and epidemiological documentation (Lowenstein, 1994).

Gleaves et al. (2001) reviewed the empirical evidence for the diagnostic validity of DID on grounds of research conducted during the past ten years. They concluded that DID appears to meet all of the guidelines for inclusion and none of the exclusion criteria. DID is also one of the few disorders currently supported by taxometric research.

In 1996 Waller et al. identified two types of dissociation, pathological and non-pathological dissociation, by using so called taxometric analyses. Furthermore, the taxometric studies seem to

support the validity of a pathological dissociative disorder whose features are consistent with that of DID.

### **Factors that determine how we cope with trauma**

As a species, humans have developed a wide variety of biopsychological survival mechanisms, or adaptive responses, in face of life-threatening and invading circumstances. Each individual has a unique repertoire of stress responses in relation to different stressors depending on the severity of the stressor and how prepared each individual is, mentally and emotionally, for the exposure. When exposed to threat or pain in the most extreme circumstances, there might be involved defensive responses without conscious processing. These range from “fight or flight”- responses, or hyperarousal - which involves extraordinary bodily activation and arousal, to ”surrender”-responses which are characterized by altered perceptions of the environment, and a seemingly normalized level of bodily activation.

Dissociative mechanisms may be involved in the surrender and freeze responses, but dissociation can also occur without the loss of executive control, and this is referred to as partial dissociation, which might be very useful during combat.

One would then experience to be very much in tune with what is happening on one level, and at the same time, one would be able to disregard physical pain, or be able to disregard otherwise grotesque scenarios.

How each individual reacts is determined by many factors. Men seem to react within the hyperarousal specter and women and children seem to use dissociative responses. Perry & Pollard (1998) have shown how the use of different types of adaptive responses in one given stress-situation, lays the foundation for response-patterns in similar situations – in other words, they describe how state-dependent and situation-dependent responsiveness determine the development of personality – that is, how states become traits. This is observed in

complex disorders such as DID, Borderline personality disorder and Somatization disorder.

Maladaptive patterns caused by overwhelming and life-threatening physical and psychological experiences, or stressors, determine how we develop as persons and how we attach to other people. And the earlier we are exposed to extreme violence and abuse, the more inhibited we become in reaching our full potential, socially, creatively and emotionally. And the more rigid we become when facing new stressors.

In addition, there seems to be a pattern among traumatized individuals that they, for different reasons, engage in activities where their stress-responses are re-released – a phenomenon called re-enactment. Hence, many trauma survivors seem to re-traumatize themselves in the course of engaging destructive repetition patterns.

The concept of schemas is helpful in conceptualizing what happens to people when they experience trauma. People who experience traumatic events draw on their pretrauma schemas in order to process their experience. When confronted with trauma, self-schemas reflecting strong coping abilities, resiliency, trust in others and the environment, and self-efficacy are likely to have a significant positive influence on the individual’s meaning making, peritrauma responses, posttrauma emotional activation and bodily sensations, and posttrauma recovery.

Maladaptive selfschemas that comprise qualities such as intense fear, incompetence, unworthiness, vulnerability, and weakness are far more likely to negatively impact the trauma victim or survivor. Schematic functioning, then, can function as an asset protecting the individual from developing PTSD or as a liability contributing to the development of PTSD.

### Trauma and comorbidity

Sequaele after trauma is detected among all clinical populations, from those enduring anxiety disorders, depressive states, somatization disorders, and eating disorders, to those who suffer fully developed PTSD and DID. Trauma may also lead to a large amount of additional problems, such as self-inflctions, substance abuse, diminished anger and impulse-control and sexual dysfunctions.

Lysaker and colleagues (2005) found higher levels of emotional discomfort and more pronounced positive symptoms in schizophrenia and schizoaf-fective patients with childhood sexual abuse. In relation to psychosis, stress may add to other vulnerability factors by reducing the capacity to cope. This may, again, interact with the progress of psychopathology. Hence, a 'building block' effect has been reported for schizophrenia, indicating that an increasing number of traumatic experiences is related to an increase in the severity of the psychotic symptoms. .

According to Allen & Lauterbach (2007) a number of studies have found that persons who have experienced childhood trauma are more likely to be diagnosed with a personality disorder in adulthood. Borderline personality disorder, in particular, has been studied in depth and appears to be a common disorder among adults with a history of childhood sexual abuse.

### Neurobiological effects of trauma

In 1889, Janet hypothesized that traumatic memories are stored differently in the brain than other types of experiences. He believed that traumatic memories are stored more as emotions and senses than as cognitions. However, there was no technology available to test Janet's beliefs in those days, but due to technological advances in psychobiological research methodology during the past 20 years we are now able to disclose how trauma affects us both on a neurophysiologic and hormonal level.

The function of the human infant's brain is to develop in stepwise sequences, and during some of these steps the brain is extra sensitive during which particular environmental experiences affect the brain maturation. Some experiences are essential, others cause harm. Active processes in this bio-behavioral system are the *mother-infant interaction*, and the development of *self* through self-regulation (Perry et al., 1995; van der Kolk, & Fisler, 1994).

Neurobiological research today suggests that severe trauma may produce a cerebral dysfunction via over-stimulation of the developing limbic and neocortical system (Diseth, 2005). These are the latest mature parts of the brain and therefore the most vulnerable to harmful stress.

Many structural and neurobiological consequences of early stressful experiences in childhood have been identified such as reduced corpus-callosum size, attenuated development of the left neurocortex, hippocampus and amygdale and enhanced electrical irritability in the limbic structures (Diseth, 2005).

Several of these brain changes in traumatized children and adolescents are related to different aspects of stress systems within the brain. During any type of trauma, neurotransmitters in the brain set off the release of a series of chemicals:

- **Catecholamines**, including norepinephrine and epinephrine, which are responsible for the widely known "fight or flight" response and create a state of "hyperstress".
- **Coriticosteriods** are responsible for regulating the amount of catecholamines that are released, providing energy, and assisting immune functions.
- **Oxytocin** is responsible for inhibiting memory consolidation.
- **Vasopressin**, an anti-diuretic hormone, prevents dehydration.
- **Endogenous opioids** control pain and overwhelming emotions.

With "normal" amounts of stress, these chemicals facilitate a process that allows people to function with greater endurance, strength, immunity, and



clarity. In extreme amounts of stress, however these chemicals may often be released in amounts that are damaging to the brain and inhibit memory functions.

Research indicates that high levels of norepinephrine, epinephrine, and endogenous opioids interfere with the storage of explicit (declarative) memory. Therefore, traumatic memories are believed to be stored in the implicit form, as emotions and senses (van der Kolk, van der Hart, & Marmar, 1996).

### Detecting trauma

There has emerged a vast amount of trauma-oriented and dissociation related assessment-instruments. For assessing PTSD one might use the CAPS (*Clinician administered PTSD scale for DSM-IV*; Blake et al, 1997), which taps all the symptoms of PTSD, both lifetime and current, and indicates the severity in the disorder. Dissociative disorders can be assessed with the SCID-D (Steinberger, 1995), a structured clinical interview developed for making DSM-IV diagnosis, or by using self-report devices, such as the DES (*Dissociative experience scale*; Dubester & Braun, 1995) and the DIS-Q (*Dissociation questionnaire*; Vanderlinden et al, 1991). Somatoform dissociative symptoms, can be assessed with the SDQ-20 (Nijenhuis et al, 1996).

In the search of valid trauma-measures, a series of investigations have compared traumatized and non-traumatized populations with regard to hypnotizability and specific psychophysiological reaction patterns. Although trauma mediates dissociation, and there is evidently a close relationship between dissociation and hypnotizability, a history of trauma does not alter hypnotizability in most individuals. Putnam, Helmers, Horowitz, and Trickett (1995) found that hypnotizability was not more predominant among abuse victims compared to non-abuse controls. However, highly hypnotizable subjects in the abuse group were significantly more dissociative than low hypnotizable subjects.

In line with this, Dale and colleagues (2009) found that persons with DID were significantly more hypnotizable than persons with other dissociative diagnosis and non-clinical controls, suggesting that that hypnotizability is one of the most central clinical features in DID. This implies that a standard hypnosis test can be used as a differential diagnostic tool.

PTSD patients have been reported to differ from normal survivors by poor habituation of skin conductance to a repetition of loud startling noises. Davidson and colleagues (2004) suggested that this tendency to continue to identify and classify the loud tones as threatening may represent a primary defect among persons with PTSD. Due to this defect, PTSD-patients are likely to continue to react to noises rather than rejecting them as redundant information. It has also been suggested by Orr et al (2002) that individuals with PTSD have an increased tendency for vigilance, i.e., they monitor the environment for potentially threatening stimuli. Davidson et al. suggested that this tendency to continue to identify and classify the loud tones as threatening may represent a primary defect among persons with PTSD.

Among persons with DID the picture seems to be somewhat different. As shown in a study by Dale and colleagues (2008), persons with DID are characterized by involving a controlled voluntary process (as opposed to an automatic) to inhibit the effect of intrusive stressors. Thus, it is presumed that persons with DID, at least under non-life-threatening circumstances, are able to consciously redefine their perceptions of the environment when this environment starts to become unpleasant and intrusive. In this process it is quite possible that they reroute the perception of the stimuli observed and alter their experience of the situation.

Functional neuroimaging opens a wide range of possibilities in decomposing the psychophysiological mechanisms of PTSD and complex dissociation. This has been demonstrated in an experiment by Reinders et al. (2003), who used functional neuro-imaging within a group of 11 persons with DID in order to investigate the anatomical locali-

zation of self-awareness and the brain mechanisms involved in consciousness. They tested the hypothesis that different "action systems" (see p. 11 for more details) have different psychological, physiologic and neural reactivity to conditioned threat cues. These assumptions have to some extent been supported. It was demonstrated specific changes in brain activity consistent with the ability among participants to generate at least two distinct mental states of self-awareness. The findings also revealed the existence of different regional cerebral blood flow patterns for different senses of self.

### Recovery and treatment

Much of the research into PTSD risk-factors shows that both social support and life stress play a role in the individual's ability to a) process through the experience (i.e., go through expected nonpathologic reactions to traumatic events) and b) resume daily functions.

Survivors from traumatic incidents are also recommended to do the following in order to promote their own recovery process:

- Exercise vigorously within 24-48 hours after the trauma (or after a flashback). This can help flush the toxic chemicals from their systems. Exercise also emits endorphines which helps to alleviate symptoms of depression and builds the immune system.
- Write about their experiences of victimization. This helps to integrate the implicit and explicit memory functions.
- Engage in memory building exercises. Every time people learn, they strengthen their dendrites which transmit and categorize information in their brains.
- Try biofeedback or relaxation techniques. Biofeedback teaches people to control biological functions. This can help to alleviate states of chronic stress that have been caused by the catecholamines.

The main goal in trauma therapy is to assist the patients to integrate their memory functions so that

they can recall the trauma verbally and lessen the immobilizing emotional/sensory responses. The process of integrating the traumatic event into the schematic structure can be impeded by events following the traumatic experience, therefore causing the schematic structure of the event to be negative. Life stress may, in effect, consume the individual's coping and adaptation resources leaving him or her vulnerable to PTSD.

During the past 30 years, a series of specialized trauma-oriented clinical interventions have been developed, from short term approaches such as psychological debriefing (Dyregrov, 1997) and Eye Movement Desensitization and Reprocessing (Paulsen, 1995), to more comprehensive integrationist techniques applied in relation to persons with DID (Ross, 1989). Hence, there are numerous pathways out of the bad cycle of psychobiological trauma triggers. And as a practitioner one must take into account the documentation from a series of studies that show that hypnosis is an effective tool in the treatment of complex PTSD (Dale, 1996; Spiegel, 1997).

### New perspectives on complex PTSD

In order to develop a comprehensive model of complex PTSD, one must take into account how dissociative symptoms are related to an underlying structural dissociation of the personality. Accordingly, Van der Hart, Nijenhuis, & Steel (2005) have outlined a new system of classification, involving a division between *almost normal personalities* and *emotional personalities*. They have hypothesized that trauma-related dissociation may involve two divided, but not totally separated parts of the personality--each with its own sense of self. These dissociative parts are mediated by different parts of the nervous system and are believed to represent two types of action systems:

- Action systems dedicated to defense against bodily threat from others and against attachment loss, or emotional personalities (EPs), and
- Action systems related to functioning in daily life, or almost normal personalities (ANPs).

In simple trauma disorders, EPs are typically quite rudimentary, not active in daily life, and limited to traumatic re-experiences, while ANPs are quite complex, with multifaceted functioning. In more complex trauma disorders, EPs may be increasingly elaborated and autonomous, while ANPs can be more numerous and restricted to functions within certain daily life action systems.

*Primary structural dissociation* is a basic stress response pattern described as an alternation between a single dissociative part of the personality mediated by action systems of daily life and a second (rather limited and rudimentary) part mediated by defense.

Dissociation of the personality beyond a single ANP and EP may extend to additional dividedness among two or more defensive subsystems. This additional division of EP is conceptualized as *secondary structural dissociation*. Secondary structural dissociation may characterize more complex and chronic trauma-related disorders, such as complex PTSD and DDNOS (APA, 1994)

Additional division of the ANP and elaboration of EPs is called *tertiary structural dissociation*, and this is seen for example in DID. This type of structural dissociation is hypothesized to occur when the integrative capacity of the individual is too low to develop or maintain a single ANP.

In view of a growing body of evidence, they have also included a division between positive and negative dissociative symptoms in PTSD. Negative dissociative symptoms of PTSD and complex PTSD generally relate to the ANP: They constitute losses of function or phenomena. Positive symptoms generally relate to the EP: They constitute intrusion phenomena.

Furthermore it is proposed that dissociative symptoms are manifested either as psychological phenomena, labeled "psychoform" dissociative symptoms, or as bodily phenomena, labeled somatoform dissociative symptoms.

- *Negative psychoform dissociative symptoms* include loss of memory (amnesia); loss of affect, numbing; difficulty thinking things through; loss of needs, wishes, and fantasies; and loss of previously existing skills. These losses are potentially available in another part of the personality.

- *Positive psychoform dissociative symptoms* include traumatic memories and nightmares that have affective, cognitive, and somatosensory components.

### Concluding remarks

Obviously, the trauma perspective should be an integrated part of our clinical orientation, both as practitioners and researchers. And it would be advisable for us, not only to update ourselves on the latest developments in the field of trauma and dissociation, but also to go back to the roots of modern psychology and psychiatry to explore the groundwork laid down by pioneers such as Janet, Charcot and the early, one might say, uninhibited, Freud.

Through the knowledge of these early observations, ideas and conceptualizations, our contemporary research findings and clinical experiences concerning complex PTSD can be fully understood. Without this knowledge, we might only see the tip of the iceberg - and we know how much of the iceberg is hidden beneath the sea.....

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