

Trauma-related dissociation: conceptual clarity lost and found

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Objective: Imprecise conceptualizations of dissociation hinder understanding of trauma-related dissociation. An heuristic resolution for research and clinical practice is proposed.

Method: Current conceptualizations of dissociation are critically examined. They are compared with a new theory that incorporates classical views on dissociation with other contemporary theories related to traumatization, viewing dissociation as a lack of integration among psychobiological systems that constitute personality, that is, as a structural dissociation of the personality.

Results: Most current views of dissociation are overinclusive and underinclusive. They embrace non-dissociative phenomena – rigid alterations in the level and field of consciousness – prevalent in non-traumatized populations, and which do not require structural dissociation. These views also largely disregard somatoform and positive symptoms of dissociation and underestimate integrative deficiencies, while emphasizing the psychological defensive function of dissociation. They do not offer a common psychobiological pathway for the spectrum of trauma-related disorders. Structural dissociation of the personality likely involves divisions among at least two psychobiological systems, each including a more or less distinct apperceptive centre, that is, a dissociative part of the personality. Three prototypical levels of structural dissociation are postulated to correlate with particular trauma-related disorders.

Conclusions: Limitation of the concept of dissociation to structural dividedness of the personality sets it apart from related but non-dissociative phenomena and provides a taxonomy of dissociative symptoms. It postulates a common psychobiological pathway for all trauma-related disorders. Trauma-related dissociation is maintained by integrative deficits and phobic avoidance. This conceptualization advances diagnosis, classification, treatment and research of trauma-related disorders.

Key words: dissociation, psychoform dissociation, somatoform dissociation, theory, trauma.

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Conceptual clarity regarding trauma-related dissociation is urgently needed. There is pervasive misunderstanding of the nature of dissociation. It precludes consensus as to which phenomena, symptoms and disorders belong to the domain of trauma-related dissociation [e.g. 1–3]. The term dissociation is used not only to indicate ‘true’ dissociative symptoms, such as dissociative amnesia, but also non-dissociative phenomena, such as absorption. Moreover, some important categories of dissociative symptoms are generally not recognized.

Many authors indiscriminately use the term dissociation to denote processes that generate and maintain integrative failure, the result of these processes and symptoms of dissociation. Finally, there is lack of consensus regarding what extent dissociation serves defensive purposes or constitutes integrative failure. Some have suggested that the term be discarded, but this does not resolve conceptual ambiguity.

The first set of questions that need to be addressed pertain to ‘overinclusiveness’ [4]. Does dissociation encompass absorption, imaginative involvement and daydreaming? Does ‘normal dissociation’ exist as opposed to ‘pathological dissociation’ [e.g. 5–7]? Are depersonalization and derealization dissociative phenomena? The second set of questions address ‘underinclusiveness’. Does dissociation only consist of negative symptoms of functional loss such as amnesia, or does it also include positive symptoms, such as intrusions? Furthermore, does dissociation pertain only to so-called psychoform (i.e. mental) symptoms, or does it also manifest in the body, that is as somatoform dissociative symptoms [8,9]? Are conversion symptoms different from somatoform dissociative symptoms? Is a distinction between conversion disorder and dissociative disorders justified? Are acute stress disorder and posttraumatic stress disorder (PTSD) basically anxiety disorders or do they primarily involve dissociation [10–12]? Can a spectrum of trauma-related disorders that have a common psychobiological pathway be postulated? Finally, is dissociation a deficit [13], a defense [2,14] or both?

We propose that the search for conceptual clarity begins by revisiting Pierre Janet’s view of dissociation [13,15]. Based on astute clinical observation and theoretical analysis, Janet and his contemporaries postulated that dissociation denotes an organized ‘division of the personality’ [13,16], in our terms, a structural dissociation of the personality. This division involves insufficient integration among two or more ‘systems of ideas and functions that constitute personality’ [15, p. 332]. These systems do not exist in a vacuum but encompass a sense of self, no matter how rudimentary or vastly developed [e.g. 16–18]. The notion of dissociation as a structural dissociation of the personality gained more clarity in the work of Charles Myers [19]. Based on observations of acutely traumatized soldiers in World War I, he proposed that trauma-related dissociation involves a division into two parts, that is, a so-called ‘apparently normal’ personality and a so-called ‘emotional’ personality. For reasons explained below, we use the terms ‘apparently normal *part* of the personality’ (ANP) and ‘emotional *part* of the personality’ (EP) – a modification of Myers’ terminology that emphasizes that there is only

a single personality that is insufficiently integrated. ANP is dedicated to functioning in daily life in the wake of trauma, and EP to responding to (perceived) threat while being fixated in past traumatic experiences. In sum, during the 19th and early 20th centuries, dissociation unequivocally pertained to a structural division of the personality. This conceptual clarity has been lost, but can be found again and can serve as the basis for further development of the field.

We first analyze how the concept of dissociation is currently used in overinclusive and underinclusive ways. Next we outline the theory of structural dissociation of the personality that proposes three prototypical levels of complexity of structural dissociation. Finally, we discuss the theory’s strengths and limitations with regard to research and clinical practice.

Conceptual overinclusiveness

Dissociative symptoms versus alterations of level and field of consciousness

Phenomena such as absorption, spaciness, daydreaming, imaginative involvement, altered time sense and trance-like behaviour represent alterations in consciousness. These alterations can occur both in quality, that is, the level of consciousness, and in quantity, the field of consciousness. Level of consciousness pertains to the qualitative degree of conscious awareness, while field of consciousness involves the quantity of internal and external stimuli, or the classes of stimuli that are available to conscious awareness at a given time. Thus, field of consciousness may range from narrow (retracted) to wide and level-ranges from low to high. All of these alterations can be adaptive or maladaptive. For example, during threat, a high level of consciousness and retraction of the field of consciousness to threat cues are adaptive, but become maladaptive when hypervigilance and exclusive focus on perceived danger occur in the absence of actual threat. It may be adaptive to enter trance states for healthy relaxation (low level), whereas spaciness (low level) and lack of focus (unduly wide field) during therapy are maladaptive.

Maladaptive alterations in consciousness are not only pervasive in trauma-related disorders, but also in many other mental disorders [20]. However, most authors regard these alterations as dissociative phenomena [21,22] when they are related to traumatization, but they are not considered dissociative in other mental disorders. Milder forms are referred to as ‘normal dissociation’ (as in temporary loss of concentration while driving) and extreme forms as ‘pathological dissociation’. Manifestations of retraction of the field and lowering of the level of consciousness have been defined as ‘dissociation of context’ [23] or ‘dissociative detachment’ [24]. However, temporary loss of concentration, shifts in attentional focus and other alterations of consciousness, do not in themselves imply the existence of dissociative parts of the personality, that is, structural dissociation [9,15,19,25]. Dissociated experience and knowledge is memorized, thus retrievable in principle, but stimuli excluded from attention (from any part of the personality) are not. The range of levels and fields of consciousness experienced by different dissociative parts of one individual typically vary, but none

has the width of consciousness that can exist in the fully integrated individual. Alterations in consciousness, particularly those that are rigid and pathological, typically accompany structural dissociation, but involve conceptually different phenomena. The former involves failure to attend to particular stimuli, such that they are never encoded, while the latter involves memorization of particular stimuli in a dissociative part of the personality, making these stimuli potentially retrievable.

In theory it is relatively simple to distinguish between dissociative symptoms and alterations in consciousness. However, in practice this can be difficult because some forms of alteration have phenomenological overlap with dissociative symptoms and, as will be discussed later, some depersonalization symptoms are dissociative, while others involve only alterations in consciousness.

Depersonalization and derealization

Depersonalization and derealization occur in normal subjects under mild stress and in many other psychiatric disorders [20,26]. Depersonalization has been described as: (i) the result of a precipitating event; (ii) detachment of consciousness from the self or body, including feelings of strangeness or unfamiliarity with self and out-of-body experiences; (iii) detachment from affect, that is, numbness; (iv) a sense of unreality, such as being in a dream; and (v) perceptual alterations or hallucinations regarding the body [26,27]. Derealization involves a sense of unreality and unfamiliarity with one's environment and distortions of space and time [26]. Both phenomena occur with intact reality-testing.

The literature has long held that depersonalization and derealization are dissociative symptoms. To an extent, there again seems to be confusion between structural dissociation of the personality and alterations in consciousness. Depersonalization evoked by conditions such as sleep deprivation, illness, substance abuse, sensory deprivation and mild to modest stress usually reflects alterations in consciousness, not structural dissociation. Steinberg [26] has noted that the distinguishing feature of 'pathological' depersonalization is a dissociation between an observing and experiencing ego, that is, a particular form of structural dissociation of the personality. This is a common experience reported by victims of childhood sexual abuse [28], motor vehicle accident victims [29] and soldiers in combat [30]. Putnam [31] also proposed that dissociation between an observing and experiencing ego is to be distinguished from other symptoms of depersonalization.

Non-dissociative depersonalization and derealization may accompany structural dissociation as manifestations of alterations of consciousness and may be severe [26]. Dissociative parts of the personality may often experience such alterations [32].

Conceptual underinclusiveness

Negative and positive dissociative symptoms

The presence of both negative and positive dissociative symptoms has long been observed in psychiatry [9,15,19,33–35]. Negative dissociative symptoms refer to apparent losses, for example, of memory, motor control, skills and somatosensory awareness. Such losses are only 'apparent' because experience that tends not to be available to one dissociative part of the personality may actually be available to another part. Positive dissociative symptoms represent dissociative intrusions. These intrusions occur when particular 'ideas and functions' involving

one dissociative part of the personality temporarily enter the psychological domain of another part. Examples include hypermnnesia (including intrusion of traumatic memories) [36] and a host of somatoform dissociative symptoms described later.

Contemporary literature has recognized only a limited number of dissociative negative symptoms, for example amnesia and dissociative depersonalization [21,27]. A few authors have identified their counterparts, that is, positive dissociative symptoms [9,24,36,37], but most have not [3,38,39].

Schneiderian first-rank symptoms characteristic of schizophrenia are commonly found in cases of dissociative identity disorder (DID) and complex PTSD [40–42], but are also noted in other trauma-related disorders. These phenomena (with the exception of thought broadcasting) can all represent intrusion of dissociative experiences, thus can be considered positive dissociative symptoms. Intrusion is an essential diagnostic feature of PTSD in DSM-IV but has often not been understood as dissociative. However, intrusions imply a lack of integration of the part(s) of the personality that remain fixated in traumatic events, thus a lack of integration of the personality. Positive dissociative symptoms, including intrusions, are common in trauma-related disorders.

Psychoform and somatoform dissociative symptoms

Most contemporary views of dissociative symptoms only recognize psychoform dissociation [9], that is, dissociation of mental functions pertaining to memory, consciousness, and identity (as found in DSM-IV). The fact that dissociative symptoms also pertain to functions of movement, sensation, and perception, that is, somatoform dissociation [8,33,43,44], has been largely overlooked for long periods of time. This oversight is remarkable, since somatoform dissociative symptoms were regarded as major symptoms of hysteria [15] and later, of shellshock in World War I [9,19]. During the last decade there has been growing acknowledgement of somatoform dissociation. A number of proposals have been made to change the name of conversion symptoms and disorders to somatoform dissociative symptoms and disorders, though language variations occur among various authors for the proposed name change [9,22,33,43–46]. This acknowledgement is corroborated by empirical evidence [8,47–49].

Negative somatoform dissociative symptoms involve apparent losses of sensory, perceptual, affective or motor functions. Positive somatoform dissociative symptoms include sensorimotor and affective aspects of traumatic re-experiences such as sensory distortions, pain, tics and panic associated with one dissociative part that one or more other parts have not integrated [9,15,23,33]. Some of the negative somatoform dissociative symptoms can be found in the ICD-10 diagnostic category of dissociative disorders of movement and sensation [45]. However, the ICD-10 omits positive somatoform dissociation.

Structural dissociation of the personality

Putnam [31] proposed a trauma-related developmental pathway to structural dissociation via repetitive evocation of 'discrete behavioural states' in the traumatized infant or young child. These states are precursors to a normative cohesive personality. In infants and young children, psychobiological functioning and the sense of self are still highly state-dependent [50]. The child's integrative capacity [51] develops

with psychobiological maturation of brain structures that serve major integrative functions (e.g. hippocampus, prefrontal cortex) and with the acquisition of skills to sustain, modulate and integrate states [31,51]. Cohesion among various discrete behavioural states in infants and children is also promoted by secure attachment that provides physiological and psychological regulatory functions [52,53]. Recurrent traumatization of the child compromises these psychobiological developmental processes, yielding lack of integration among behavioural states [31]. Putnam's theory has met acceptance [54,55] and is supported by findings that the severity of traumatization, as well as disorganized attachment at early developmental levels are major predictors of dissociative symptoms in adolescence [56]. Lack of integration among discrete behavioural states is an antecedent to dissociative parts of the personality.

Further progress in the field requires a detailed theory that predicts what kind of differences exist among what types of dissociative parts of the personality in trauma-related disorders. Although the variety of dissociative parts developed in individuals is unlimited in principle [57], some divisions of the personality in trauma are more probable than others. The existence of evolutionary-prepared emotional operating systems [58], also known as functional systems [59] or action systems, should be taken into account [60] when specifying how the personality tends to divide in trauma. These psychobiological systems are inborn, self-organizing and self-stabilizing within limits of time and homeostasis and open to classical conditioning. They are influenced and shaped by experience and action and engage tendencies toward specific emotions, actions and selective attention for cues that bear relevance to the functions that they serve. They include: (i) a number of action systems specifically dedicated to activities of daily life and to survival of the species, through energy management, sociability, attachment, reproduction, caregiving (child rearing), exploration, and play; and (ii) a defensive action system (including a range of subsystems) dedicated to survival of the individual in the face of threat. Threat of and actual separation from caretakers activates the panic system, and triggers 'attachment cries' and search for caretakers. Predatory threat evokes defensive subsystems, that is, hypervigilance, flight, freeze/analgesia, fight and total submission/anaesthesia. Recuperation is a subsystem closely related to defense. It involves return of pain perception, wound care, isolation from the group and rest. Psychological or emotional threat evokes submissive, aggressive, avoidant and other relational defenses connected to attachment and sociability action systems.

The essential and primary form of trauma-related structural dissociation of the personality is a lack of integration between parts of the personality that are mediated by daily life action systems and defensive action systems as a result of threat to bodily integrity and threat to life. The action tendencies involved in these two sets of action systems tend to inhibit each other once they are strongly evoked, hence are not easily integrated in circumstances of major threat, particularly chronic threat. A number of World War I military physicians observed this primary structural dissociation among acutely traumatized ('shell-shocked') combat soldiers [9,19,61,62]. Myers [19] discussed structural dissociation in terms of alternation between an 'emotional' (part of the) personality (EP) dedicated to defense and an 'apparently normal' (part of the) personality (ANP), dedicated to daily functioning. Both EP and ANP were distinctly different from the pretraumatic personality. EP remains in fixated action (defense, recuperation, attachment behaviours) and in fixated attention to a very limited range of cues (threat,

rest, caretaker need). Thus, the attention of EP is primarily focused on the trauma (re)experienced as a current event. The ANP is phobic of traumatic memories and the EP that encompasses these memories, while the field of consciousness is retracted to matters of daily life. Phobic avoidance may quickly develop [63] but can also be progressively learned and generalized over time. It may contribute to the development of more or less extensive amnesia of the trauma, detachment and numbing in ANP.

Avoidance of EP and its traumatic memories is adaptive to the extent that accessing traumatic memories would compromise ongoing functioning of ANP in daily life. In this sense, dissociation serves a defensive function. However, authors who propose that dissociation is primarily a psychological defense against overwhelming fear, pain, grief, and helplessness [2,14,64] usually only describe negative psychoform dissociative symptoms. Positive psychoform dissociation (such as flashbacks) as well as positive somatoform dissociation (such as trauma-related pain) can hardly be described as defensive phenomena. Thus, trauma-related structural dissociation is more aptly considered a deficit, that is, a lack of integrative capacity [13]. One current view states that dissociation is both a deficiency and a defense [65–67]. It is only in the context of insufficient integrative capacity that trauma-related structural dissociation of the personality can serve a defensive function, in that it allows ongoing functioning of ANP in daily life. Structural dissociation starts to outlive its usefulness as a psychological defense when the integrative capacity of the patient increases.

The characteristics of EP and ANP can be described largely in terms of negative and positive, and psychoform and somatoform dissociative symptoms. ANP is primarily characterized by symptoms related to loss or inhibition, that is, negative dissociative symptoms such as amnesia, anaesthesia and paralysis. EP's symptoms typically manifest as acute, transient dissociative intrusions into ANP, or a complete re-experiencing of the trauma. These include positive psychoform and somatoform dissociative symptoms. However, EP may also experience negative symptoms such as freezing, analgesia and anaesthesia, which are directly connected to the traumatic experience, lack of orientation to present (time, place), and insufficient connectivity with other parts of the personality.

Both ANP and EP display DSM-IV personality traits, that is, 'enduring patterns of perceiving, relating to, and thinking about the environment and [them]selves' [67, p. 630]. In the case of ANPs, these patterns 'are exhibited in a wide range of social and personal contexts' (p. 630). In the case of EPs, which generally do not appear in a wide range of contexts, such patterns are exhibited consistently upon their reactivation. However, to call these dissociative parts 'personalities', as Myers did, suggests an undue reification of separateness. It is the patient's single personality that is divided into two or more parts, or psychobiological systems. Still, as a general rule ANPs especially, but also EPs, consist of a range of states rather than a single one. For example, ANP may have various emotions (e.g. sadness, joy, irritation), as well as a range of behaviours, sensations and mental activities. EPs' possible states are also varied and complex at least some of the time, also including various affects such as terror, rage or panic, and behaviours and sensations related to the trauma. As Braude [57] noted, dissociative parts of the personality tend to be 'apperceptive centres', that is, are self-conscious to a greater or lesser degree and believe that a range of mental states are their own, while other states are not.

The degree of dissociation among ANP and EP varies. They do share at least some personified experiences and procedural, semantic

and episodic memories. Strictly speaking, there is not a part of the personality that can be described as non-dissociated once the personality is structurally divided, an understanding that runs contrary to most of the literature. For example, Spiegel and Cardena state that 'dissociated behaviours and cognitions [EP] may exert an influence on non-dissociated components of behaviour and experience [ANP]' [27, p. 367]. The domain of ANP is far larger than that of EP in simple cases of structural dissociation and limited forms of traumatization, but this difference is smaller or nonexistent in more complex forms related to chronic traumatization.

Although structural dissociation should be regarded as a dimensional construct, for heuristic purposes three prototypical levels can be distinguished [37,60,68,69]. Within each level, dissociative parts of the personality can be more or less complex and lead a more or less autonomous existence. Secondary elaboration of dissociative parts may occur over time, with conditioned exposure to the present, and may be influenced by sociocultural factors.

Primary structural dissociation

Primary structural dissociation involves a single ANP, associated with detachment, numbing and partial or complete amnesia of the trauma, and a single EP (usually rather limited in scope), associated with hypermnnesia and re-experiencing of the trauma. Uncomplicated forms of trauma-related disorders such as basic acute stress disorder, simple PTSD, simple dissociative amnesia, and simple somatoform dissociative disorders (i.e. DSM-IV conversion disorders or ICD-10 dissociative disorders of movement and sensation) probably could be characterized by this primary structural dissociation.

Brett [10] stated two objections to considering PTSD a dissociative disorder. The first objection was confusion about the precise meaning of 'dissociation'. The analysis presented here of positive and negative dissociative symptoms, as well of primary structural dissociation of the personality, supports the notion of PTSD as a dissociative disorder. Brett's second objection is that, although there is overlap in symptoms between (acute stress disorder and) PTSD on the one hand and the DSM-IV dissociative disorders on the other, there are also significant differences in pathology. The increasing complexity of structural dissociation across the trauma-related disorders, along with the mounting elaboration and autonomy of parts and the characterological effects of chronic traumatization, may explain many differences in observed psychopathology.

Secondary structural dissociation

Dissociation of the personality beyond a single ANP and EP (predominantly mediated by daily life action systems and defensive action systems, respectively) may extend to additional dividedness among two or more defensive subsystems, that is, hypervigilance, flight, freeze, fight and total submission, as well as the 'attachment cry' and recuperation. We conceptualize this additional division of EP as secondary structural dissociation. Each of these EPs is characterized by an even more extreme retraction of the field of consciousness than a single EP, largely limiting their experiential world and behavioural repertoire to one or a few particular subsystems of defensive interests. The level of consciousness varies. In hypervigilance and freeze it is high; in total submission it is low.

When these subsystems are evoked in succession across time and progression of threat imminence, we propose to label this phenomenon sequential structural dissociation, or briefly, sequential dissociation [70]. Dividedness may also be manifest within a single moment of time, for example between an observing EP and an experiencing EP (dissociative depersonalization), or between a number of simultaneously active EPs, each serving different physical defensive functions. This is referred to as parallel structural dissociation, or parallel dissociation [70].

Secondary structural dissociation likely manifests in more complex trauma-related disorders, such as complex forms of acute stress disorder, complex PTSD [71,72] (also known as disorders of extreme stress [73]), trauma-related personality disorder [74,75], dissociative disorder not otherwise specified (DDNOS) [68], complex dissociative amnesia and complex somatoform dissociative disorders. Although not included in the DSM-IV, complex PTSD encompasses a range of associated descriptive features listed under the DSM-IV diagnostic category of PTSD that 'may occur and are more commonly seen in association with an interpersonal stressor' (p. 425). These interpersonal stressors usually encompass more than a single traumatic event, thus increasing the probability of a more complex level of structural dissociation and the likelihood that all or most parts will also engage in relational defenses.

Tertiary structural dissociation

Division of ANP in addition to dissociation among EPs is termed tertiary structural dissociation [60,69]. It is limited to dissociative identity disorder (DID), which is often comorbid with complex PTSD or personality disorders. Early and chronic traumatization may prevent the development of a relatively cohesive pretraumatic personality [31]. Thus, childhood trauma may interfere with the normal developmental pathway toward integration of action systems dedicated to functions in daily life, promoting the emergence of more than one ANP. Recurrent childhood traumatization also enhances secondary elaboration of EPs.

Many, if not most DID patients have experienced not only abuse, but considerable neglect and attachment disruption from an earlier age [56,76–79]. When neglect and trauma begin early in life, a disorganized/disoriented style of attachment tends to develop [55,80]. In fact, this type of attachment seems to be organized, characterized by chronic and sometimes rapid alternation of systems of attachment and other daily life action systems (ANP) and systems of defense (EP) [55,81]. Separation from the abusive caregiver activates the attachment system, and proximity, the defensive system. This alternating pattern manifests as a phobia of attachment and detachment. Chronic structural dissociation among attachment and defense may enable children to survive in chronically abusive social environments. However, this dissociation becomes dysfunctional when applied to other relationships that are secure. Structural dissociation of the ANP does not exclusively occur during trauma per se. It may also result when certain inescapable aspects of daily life become associated with past trauma and become conditioned stimuli that tend to reactivate traumatic memories. For example, a DID patient with a history of childhood sexual abuse became pregnant and needed prenatal examinations by an obstetrician. She developed a new ANP which was able to tolerate the physical examinations without intrusion of traumatic memories, since the examinations were stimuli that evoked memories of rape.

The field of consciousness of various ANPs is more restricted than in a single ANP. Each of these ANPs selectively attends to cues that are pertinent to their limited range of action systems (e.g. caretaking, work). Some ANPs are high-functioning and consciously aware of many issues. Still their field of consciousness can be quite restricted in that they fail to appreciate the importance of other issues. Some dissociative parts of the personality in DID may have characteristics of both ANP and EP, making distinctions among them much more difficult, which is why we have suggested prototypical dissociative parts of the personality.

Maintenance of structural dissociation

Persistence of structural dissociation of the personality is an essential feature of trauma-related disorders that range from PTSD to DID. Since living organisms presumably have a natural tendency toward integration [51], what maintains structural dissociation when traumatization has ceased? One likely candidate is classical trauma-related conditioning. This type of learning involves associating stimuli that saliently signaled or accompanied the overwhelming event or the event itself. When survivors have associated these previously neutral, now conditioned stimuli and unconditioned stimuli (i.e. the traumatizing event), they will tend to respond to the conditioned stimuli with defensive responses that may be similar to the original reactions. For example, the specific mood (e.g. anger) of the caretaker when abusive, as well as the stimuli that apparently tended to elicit this mood, can become conditioned stimuli that trigger defensive reaction patterns such as flight, freeze, fight or submission.

Classical trauma conditioning can generate effects that maintain structural dissociation [60]. Structural dissociation is imperfect and thus intrusions of traumatic memories occur in traumatized individuals. When the integrative capacity of the individual does not suffice for integration, ANP will respond to these positive dissociative symptoms with typical mental avoidance reactions: retraction of the field or lowering of the level of consciousness, and (re)dissociation of EP and the traumatic memories. At the same time, ANP learns to fear and avoid internal and external stimuli that signal or refer to EP. As time progresses, there is an ever-widening range of internal and external conditioned stimuli and contexts that ANP must avoid. Some phobic avoidances may become automatic and be outside of awareness.

In addition to classical fear conditioning, evaluative conditioning [82] of external and internal stimuli may occur. This type of cognitive learning produces robust effects. It involves conjointly presenting two stimuli, a neutral stimulus and a stimulus that the individual affectively evaluates in a negative (or positive) manner. As a result, the previously neutral stimulus adopts a similar negative (or positive) tone. For example, when the traumatizing event was experienced as a shameful event, ANP may learn to be ashamed of EP and to despise it.

In cases of secondary and tertiary dissociation, EPs and ANPs may learn to fear, reject and avoid each other along similar pathways of classical and evaluative conditioning. These conditioned fear and evaluative reactions interfere with normal integrative tendencies. In this way structural dissociation involves self-perpetuating feedback loops that promote chronicity.

Relational factors that maintain structural dissociation

Social learning can also reinforce phobic avoidance and maintain structural dissociation. Social support in the aftermath of trauma buffers negative effects [83,84]. However, when significant others deny trauma instead of assisting in the integration of the painful experience, or prohibit talking about it, dissociative tendencies are enhanced, for example in intrafamilial childhood sexual abuse [85]. Several studies have thus found that dissociative amnesia is most strongly associated with this type of trauma [86,87] and that a cohort of patients with complex dissociative disorders reported total absence of support and consolation following abuse [87]. Furthermore, PTSD has also been associated with lack of support in the aftermath of trauma [88]. Thus, structural dissociation can be partially maintained by lack of immediate and long-term social support and restorative experiences following trauma.

Discussion

The view of dissociation as structural division of the personality resolves the conceptual problems that have impeded the field. It regards alterations of level and field of consciousness as related but non-dissociative phenomena and reintroduces positive and somatoform dissociative symptoms. Negative and positive dissociative symptoms stem from a structural trauma-related dissociation that involves a relative dividedness, not total separation, among parts of the personality mediated by action systems dedicated to defense against bodily threat from others and against attachment loss ('emotional parts of the personality' [EPs]) and to functioning in daily life ('apparently normal parts of the personality' [ANPs]).

This theory serves as a unique heuristic for research because it explains what organizes and links the wide range of trauma-related disorders and it proposes psychobiological differences that might exist for various types of dissociative parts (ANP and EP) [6,89]. We are not aware of any other theories that propose a common psychobiological substrate and treatment approach for the spectrum of trauma-related disorders. At a general level, the theory predicts that ANPs and EPs will have different psychological, physiologic and neural reactivity to conditioned threat cues. EP would be fixed in emotional reactivity, whereas ANP would engage in inhibition of emotivity. These hypotheses are supported in recent research with DID patients [89, Reinders *et al.* unpublished data]. A related hypothesis is that compared to ANP, EP would have lower degrees of integrative capacity, which is consistent with the finding that trauma-fixated dissociative child parts (EP) have less EEG coherence than adult parts exerting functions in daily life (ANP) [90]. Still another hypothesis is that ANP and EP display different neuroendocrine and neural profiles when exposed to conditioned threat cues. Consistent

with this, the cortisol level of PTSD patients depends on engagement (fearful, hyperaroused EPs) or disengagement (ANP or hypoaroused, totally submissive EP) in traumatic memories [91]. Their patterns of brain metabolism depend on whether they re-experience traumatizing event while listening to trauma scripts (hyperaroused EP), or develop a negative dissociative reaction (ANP or hypoaroused EP) [92]. Finally, the theory holds that different types of dissociative parts are mediated by different parts of the nervous system. ANPs would be predominantly associated with the ventral vagal branch of the parasympathetic nervous system; hyperaroused EPs (flight, freeze, fight) with loss of ventral vagal control over the sympathetic nervous system and the sympathetic system itself; and hypoaroused, totally submissive EPs with the dorsal vagal part of the parasympathetic nervous system. These ideas are consistent with Porges' polyvagal theory [93].

Research testing the theory of structural dissociation is complicated when patients have not learned to activate the dissociative parts of interest in a controlled manner, with or without assistance from the therapist, and when they inadvertently and strongly activate other parts than the part of interest during testing. Furthermore, the homogeneity of experimental groups is compromised to the extent that the functioning of the dissociative parts per experimental group is mediated by a complex set of action systems (e.g. play, flight and fight) and these parts engage different action systems during testing.

The distinction between purely dissociative symptoms and alterations of consciousness may be difficult both in research and in clinical practice, as noted earlier. However, it is imperative to observe whether these phenomena accompany structural dissociation or without it, as treatment interventions will be different depending on whether structural dissociation is present or not. The theory of structural dissociation suggests that treatment should aim for the integration of dissociative parts within the confines of a coherent personality, including their mental contents and associated action systems. For this process to succeed, the various phobias that maintain structural dissociation need to be overcome within a psychophysiological window of tolerance for the patient. Thus, the theory of structural dissociation aids in understanding the need for phase-orientated treatment, which is the current standard of care in the treatment of severely traumatized patients [68]. The theory supports the notion that therapy must begin with strengthening the ANP's integrative capacity and ability to function in daily life, including modulating and tolerating psychophysiological states. EPs that are intruding with re-experiences should be contained. Next the integrative capacity of EPs should also be raised so that they can

engage in more complicated actions than in reflexive defense, wordless terror, extremely retracted fields of consciousness and reflexive beliefs and disorientation in time. Communication and co-operation among different parts begins first with a mutual focus on daily life rather than the traumatic past and should replace phobic avoidance and recurrent conflicts among parts of the personality. Only when sufficient progress has been made in these and other areas of functioning, should the treatment of traumatic memories be considered. The treatment reaches completion when the previously dissociative parts merge into one coherent personality and the survivor learns how to adapt to and function in current life in the most effective and efficient way possible. Action systems of daily life become more functional and cohesive, while systems of defense are reserved for genuine threat.

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