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Chapter · December 2020

DOI: 10.1007/978-3-030-49414-8_16

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CHILDHOOD TRAUMA AND DISSOCIATIVE DISORDERS

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Abstract

Dissociative disorders constitute an exemplary disease model of the biopsychosocial paradigm in psychiatry. Being a post-traumatic condition related to developmental adversities, both biological underpinnings, as well as the neurobiological consequences of chronic stress, and the social context where the traumatic experiences occur, influence the pathogenesis, expression, and treatment of dissociative disorders. The central dimension of dissociative psychopathology is a disturbance of sense of self and/or agency which may be accompanied by amnesias, due to altered metamemory processes. Such dissociation is a consequence of the disturbed mutuality between external realities and the internal world (psychological realities) which require synchronization. This disorganization may lead to alterations of consciousness, which may interfere with cognitive abilities, vigilance, and awareness of the individual. As one of these disturbances may predominate in a particular patient or for a period of time, the therapeutic intervention requires flexibility both within an ongoing treatment as well as between different patients. The trimodal model of complex trauma and dissociation provides a basis to understand this spectrum of psychopathology which is in analogy with the response of the body to an injury or the components of a bodily disease.

Introduction

Dissociation is characterized by a disruption or discontinuity in usually integrated psychological functions such as memory, consciousness, perception, sense of self and agency, or sensori-motor abilities (American Psychiatric Association, 2013). Thus, dissociation may affect any psychological faculty, albeit reversibly. In its most dramatic and chronic form, such discontinuity takes the form of marked identity disruptions typically observed in dissociative identity disorder (DID). Other types of dissociative disorders represent either partial representations of chronic dissociation (i.e. limited to a smaller number of symptoms), or an acute and/or transient dissociative reaction to a stressful event (either of the mono- and poly-symptomatic type).

Epidemiology of Dissociative Disorders

Studies conducted in various countries led to a consensus about the prevalence of dissociative disorders which is slightly over 10% in clinical settings, where relatively severe types of the disorders predominate (Şar, 2011a). The prevalence rates seem to be higher in the general population due to the preponderance of milder or partial types of dissociative disorders (Johnson, Cohen, Kasen, & Brook, 2006; Şar, Akyüz, & Dogan, 2007). There are special populations where the prevalence of dissociative disorders exceed these rates; i.e. adolescent psychiatric outpatients, patients who are admitted to psychiatric emergency ward, and dependents of chemical drugs (Table 1).

While women predominate in clinical settings (Şar, Tutkun, Alyanak, Bakım, & Baral, 2000; Tutkun, Şar, Yargıç, Özpulat, Yanık, & Kızıltan, 1998), one study in the general population (Johnson, et al, 2006) based on a standardized diagnostic clinical interview yielded no significant difference in gender distribution of dissociative disorders. A further study in the general population based on self-report evaluation documented that twice women as much as men had a dissociative experiences score above the cutoff level although there was no significant difference on average scores (Akyüz, Doğan, Şar, Yargıç, & Tutkun, 1999). Apparently, women seem to be more vulnerable in development of a relatively severe clinical condition; i.e. they are overrepresented in clinical settings and among groups with more symptoms. This may be due to the differences in traumatic antecedents, gender role characteristics, help-seeking behavior, and last but not least, ways of expressing distress. For example, men with dissociative disorders are known to hide their symptoms more readily.

A study among adolescent psychiatric outpatients (Şar, Önder, Kılınçaslan, Zoroğlu, & Alyanak, 2014), however, which was based on a standardized clinical diagnostic interview did not yield a gender difference in the prevalence of dissociative disorders. It is possible that the dissociative disorders of adolescence may improve or may turn to another diagnosis in a less vulnerable subgroup of the cases over time which could explain the change in gender distribution toward adulthood. Study characteristics including differences in assessment instruments may also affect the reported prevalence rates (Friedl, Draijer, & de Jonge, 2000). For example, differences in self-report and clinical interview may have systematic reasons (Şar, Alioğlu, & Akyüz, 2017; Şar, Alioğlu, Akyüz, & Karabulut, 2014; Şar, Alioğlu, Akyüz, Tayakısı, Öğülmüş, & Sönmez, 2017). Diminished self-awareness about dissociative experiences may possibly occur due to amnesias which may interfere with self-report in particular. Fear and shame, on the other hand, may interfere with reporting in an interpersonal setting.

Table 1: Prevalence of dissociative disorders in various settings (adapted from Şar, 2011a)

Setting	Country	n	All dissociative disorders (%)	Dissociative identity disorder (%)
<i>Psychiatric inpatient unit</i>				
Tutkun, et al, (1998)	Turkey	166	5.4	10.2
Modestin, et al, (1996)	Switzerland	207	0.4	5.0
Gast, et al, (2001)	Germany	115	0.9	4.3
Friedl, et al, (2000)	Netherlands	122	2.0	8.0
Ginzburg, et al, (2010)	Israel	120	0.8	12.0
Saxe, et al, (1993)	Germany	172	4.0	13.0
Ross, et al, (1991)	USA	484	5.4	20.7
Lipsanen, et al, (2004)	Norway	39	--	21.0
Ross, et al, (2002)	USA	407	7.5	40.8
<i>Psychiatric outpatient unit</i>				
Şar, et al, (2000)	Turkey	150	2.0	12.0
Şar, et al, (2003)	Turkey	240	2.5	13.8
Foote, et al, (2008)	USA	82	6.0	29.0
Lipsanen, et al, (2004)	Norway	39	--	14.0
<i>Emergency psychiatric ward</i>				
Şar, et al, (2007)	Turkey	43	14.0	34.9
<i>General population</i>				
Şar, et al, (2007), women	Turkey	628	1.1	18.3
Johnson, et al, (2006)	USA	658	1.5	8.6
Ross (1991)	USA	454	3.1	11.2
<i>Substance dependents (chemical)</i>				
Tamar-Gürol, et al, (2008)	Turkey	104	26.0	5.8
Ross, et al, (1992)	USA	100	--	39.0
Dunn, et al, (1995)	USA	100	--	15.0
<i>Substance dependents (alcohol)</i>				
Evren, et al, (2007)	Turkey	54	9.0	0.0
<i>Women in prostitution</i>				
Yargic, et al, (2000)	Turkey	50	18.0	--
Ross, et al, (2004)	USA	20	5.0	55.0
<i>Exotic dancers</i>				
Ross, et al, (1990)	USA	20	35.0	80.0

Both clinical as well as general population studies screen rather chronic dissociative disorders. Recently, the DSM-5 (American Psychiatric Association, 2013) introduced acute dissociative reaction to a stressful event as a new diagnostic category which is listed among other specific dissociative disorders. Per definition, this category covers conditions less than one month duration. There is surprisingly little information about prevalence of such reactions which cover a large spectrum of severity reaching even the scope of a brief psychotic disorder in its most extreme form. Acute reactions may also be superposed to a chronic dissociative disorder such as DID or its partial

forms which makes an additional diagnosis redundant (Şar and Öztürk, 2019). Applications to the emergency psychiatric ward due to such acute transient conditions (“nervous breakdown”) usually serve as a diagnostic window to the clinician when core symptoms of a chronic dissociative disorder remain dormant until a stressful event triggers a more prominent manifestation (Şar, Koyuncu, Öztürk, Yargic, Kundakci, Yazici, et al, 2007).

Childhood Trauma: The Evidence

Among all psychiatric conditions, dissociative disorders are the diagnostic group which is associated with the highest frequencies of childhood trauma reports (Dorahy, Brand, Şar, Kruger, Stavropoulos, & Martinez-Taboas, et al, 2014). DID is the most studied type of dissociative disorders regarding a traumatic etiology. Namely, clinical studies in the United States, Australia, Turkey, Puerto Rico, the Netherlands, Germany, and Canada have consistently found that DID is linked to chronic abusive experiences in childhood, typically at the hands of an attachment figure (Boon & Draijer, 1993; Dorahy, Middleton, Seager, Williams, & Chambers, 2016; Martinez-Taboas, 1991; Middleton & Butler, 1998; Ross, Norton, & Wozney, 1989).

By using corroborating documentation from hospital, police and child protection agencies or witnesses, several studies have confirmed histories of severe abuse in DID (Coons, 1994; Lewis, Yeager, Swica, Pincus, & Lewis, 1997; Martinez-Taboas, 1991). There are patients who remember certain traumatic memories during treatment which were previously covered by dissociative amnesia. However, such “repressed” or “recovered memories” do not have any effect on the prevalence rates of traumatic life histories. Namely, in most clinical series, childhood abuse and/or neglect is reported by 90-100% of the patients during the study examination (Şar, Yargıç, & Tutkun, 1996; Krüger & Fletcher, 2017); i.e. before any specific treatment intervention.

For example, to eliminate any specific treatment effect and to demonstrate the accuracy of trauma reports, a screening study was conducted in a rather uninformed population of an Anatolian town (Turkey) in 1990’s (Akyüz, et al, 1999). A large representative sample of women from the general population (N=994) was evaluated in three stages: completion of a self-report measure of dissociation, administration of a standardized diagnostic interview, and clinical evaluation by a study psychiatrist. Namely, two groups of participants with high and low dissociative scores in the first stage of the study were evaluated using a structured diagnostic clinical interview by a researcher blind to the dissociation scores. Those participants who got the diagnosis of a dissociative disorder and another group of non-dissociative controls were evaluated by a study psychiatrist blind to the diagnoses and group membership. There was 100% agreement between clinicians of the second and third step in dissociative disorder diagnoses. Four cases of DID were identified and all of them reported childhood abuse and/or neglect.

Nevertheless, beside developmental traumatization, socio-cognitive sequelae, trauma-generated neurobiological responses, biologically-derived traits, and epigenetic mechanisms may also contribute to the emergence of dissociative psychopathology (Şar, Dorahy, & Krüger, 2017). There are also genetic links to dissociation in general, and in relation to childhood adversity (Lochner, Seedat, Hemmings, Kinnear, Corfield, Niehaus, et al, 2014; Wolf, Rasmusson, Mitchell, Logue, Baldwin, & Miller, 2014). High hypnotizability - itself a non-pathological, genetically derived capacity- has also been proposed to be a necessary diathesis for dissociative disorders (Dell, 2017).

Although patients with dissociative disorders have higher hypnotizability than those with other mental disorders, higher hypnotizability is also found in patients with chronic refractory posttraumatic states in general (Frischholz, Lipman, Braun, & Sachs, 1992; Spiegel, Hunt, & Dondershine, 1988; Stutman, & Bliss, 1985). In conclusion, dissociative disorders may be seen as an exemplary disease model of the *biopsychosocial paradigm* in psychiatry (Şar, Dorahy, & Krüger, 2017).

Psychopathogenesis of Mental Fragmentation

To go beyond limitations of prevalence studies, the association between childhood trauma and dissociative disorders needs to be elaborated in terms of overall conceptualization and psychopathogenesis as well. First of all, rather than being merely an anxiety-dominated response to a single traumatic event, the body of evidence drives clinicians and researchers to conceptualize trauma-related disorders also in terms of a long-lasting and multi-dimensional consequence of chronic, early, and interpersonal (developmental) traumatization (Şar, 2011b). Developmental trauma refers to a type of stressful event that occurs repeatedly and cumulatively, usually over a period of time, and within specific relationships and contexts (Courtois, 2004). Childhood abuse (sexual, emotional, and physical) and neglect (physical and emotional) constitute typical forms of chronic traumatization. The distinction between acute and chronic stress has neurobiological repercussions as well. For example, unlike claims about consequences of chronic traumatization, a recent meta-analysis on “simplex” PTSD revealed no significant changes in grey matter volume (Tench, Tanasescu, Jethwa, & Constantinescu, 2018).

Dissociative disorders are currently understood as post-traumatic developmental conditions where adverse experiences usually begin in early childhood; i.e., before puberty. For example, the identity alterations observed in DID and its subthreshold forms may be considered as an elaborated version of trauma-related mental *intrusions* and *avoidance* which corresponds to the basic mechanism of PTSD (Şar, 2017, 2018; Şar, Alioğlu, Akyüz, Tayakısı, et al, 2017). While the dynamics are similar, there are discrete identities with their own first person perspective in DID, as well as breaks in consciousness between these identities, which does not occur in PTSD.

Nevertheless, these discrete identities are usually linked to certain traumatic experiences (i.e., they may carry memories, cognitions, and emotions associated with the experience). However, such relationship may also occur in a disguised form: i.e. a distinct personality state may carry compensatory cognitive schemas or psychological defenses such as denial, projection, or rationalization to cope with traumatic experience. The mental organization on the basis of discrete identities allows long-term maintenance of an internal system which is composed of incompatible pieces of mental content. Distinct identities may also be formed by narcissistic-identificatory-fusionary processes; i.e., through copying or imitation of “others” including creation of new and modified versions of pre-existing distinct entities of the internal system upon further stressful experiences (Öztürk & Şar, 2016a). Growing up in a neglectful environment and the already started dissociative psychopathology increases such tendencies. The trauma-related interpersonal relationship pattern of “attachment to the perpetrator” (also known as “identification with the aggressor” or “Stockholm Syndrome”) is an attempt to cope with the abuse through such fusionary tendencies.

On the other hand, developmental trauma may start even in disturbances of early interpersonal attachment with caregivers. Deficiencies in mirroring is one example

of the mismatch between the infant and the caregiver (Fonagy & Allison, 2012). Bowlby (1969/1982) proposed that such experiences lead the infant to develop multiple internal representations of self and attachment figures which he called Internal Working Models (IWM). One IWM becomes dominant in regulating interpersonal relationships in a certain context, while the other IWM's remain separated from mainstream conscious experience. The latter surface in stressful situations to regulate emotions and cognitions in a way that may be perceived as alien to the person's usual sense of self. Thus, later traumatizations such as abuse and neglect or being exposed to an overtly or covertly dysfunctional family may further accentuate such fragmentation. Sense of self and agency is influenced by these alterations.

Inspired by Janet, the model of structural dissociation of personality (Van der Hart, Nijenhuis, & Steele, 2006) is based on the idea of an underlying division of personality, in which each dissociative subsystem has its own first-person perspective. While the "apparently normal" part is oriented in daily functions and avoids the traumatic mental content, the "emotional" part of personality is fixed in traumatic experiences. Traumatized individuals alternate between these different parts which may be activated in a sequence or in parallel. Each part of personality is composed of multiple actions systems devoted to survival of the individual (e.g. fight-flight, submission, freezing, cry for help) or the species.

Psychosomatic Implications of Dissociation

Putnam (1997) proposes that trauma-related discrete behavioral states do not only differ in their manifest behaviour (e.g., sleeping, feeding, socialising, escaping danger), but also in all other psychophysiological dimensions, including arousal level, heart rate, motivation, affective tone, thought patterns and content, appraisals, and brain areas activation. Conversely, among infants and young children, such psychophysiological differences may constitute the precursors of later pathological dissociative symptoms, and in the most extreme case, dissociative identities. Namely, he proposes that, initially through biological decrees (need to eat, sleep) and then through experience (e.g., exposure to traumatic stress), different behavioral states emerge to support survival and promote adaptation to the environment (Putnam, 2016). Instead of providing the origin of an integrated self-identity, emerging discrete behavioral states may be elaborated over time while being further utilized as coping mechanisms during subsequent traumatic experiences

Although bodily aspects of dissociation may be subsumed under the rubric of "somatoform dissociation" (Nijenhuis, 1998), a particular type of manifestations should be differentiated from other somatic symptoms in this spectrum: conversion (functional neurological) symptoms (Şar, Akyüz, Doğan, & Öztürk, 2009). Per definition, conversion symptoms affect voluntary organ systems (eg, vomiting, blindness, paralysis of the limbs, fainting, pseudoseizure). While chronic somatoform dissociation may point to a hidden or difficult to recognize trauma history such as childhood neglect (Kılıç, Şar, Taycan, Aksoy-Poyraz, Erol, Tecer, et al, 2014; Taycan, Şar, Çelik, & Erdoğan-Taycan, 2014), conversion symptoms usually have an acute quality which constitutes a medical emergency (Şar, Koyuncu, et al, 2007). Acute and transient conversion symptoms may be accompanied by clear-cut dissociative symptoms (e.g. depersonalization, amnesia). In particular, severe and persistent conversion symptoms may be an indicator of an unrecognized chronic dissociative disorder or PTSD.

In conclusion, dissociative disorders are composed of both negative (e.g. amnesia, loss of sensorimotor functions such as anesthesia) and positive (e.g. hallucinations, flashbacks, pseudoseizures) symptoms; i.e. symptom clusters of either the intrusion or the omission type. Those symptoms which affect sensorimotor functions (e.g. functional neurological symptoms such as pseudoseizure, dissociative blindness) may appear as presentation of a bodily (i.e. usually neurological) illness, which require general medical attention.

Consideration of the autonomous nervous system functions may be helpful in understanding these psychosomatic repercussions of dissociative disorders. Given the insights of the polyvagal theory (Porges, 2011) and of the empirical research on heart rate variability in PTSD, the sympathetic and parasympathetic response types to threat and the role of the nervous vagus in connecting “higher” mental functions with organs as well as psychobiological action systems (i.e. fight-flight, submission, freezing) serving survival in front of threat places the autonomous nervous system at the center of psychosomatic phenomena related to dissociation.

Dissociation in Trauma: Confounder or Common Denominator?

As a way of coping with unbearable pain, dissociation is increasingly recognized as a common feature of trauma-related conditions (Şar, 2011; Schimmenti, & Caretti, 2016). For example, both peritraumatic and persistent dissociation have been considered as components of PTSD with variability between individuals (Briere, Scott, & Weathers, 2005). There are ongoing debates on whether dissociation is the common denominator (Nijenhuis, 2017) or a confounder of the entire trauma-spectrum (Şar, 2011b). The latter stance is represented by the newly introduced dissociative subtype of PTSD (American Psychiatric Association, 2013) which is a construct defined solely by negative symptoms of dissociation: depersonalization and derealization (Table 2).

Specifically, while providing neurobiological underpinnings of a dissociative subtype of PTSD, a group of researchers (Lanius, Vermetten, Loewenstein, Brand, Schmahl, Bremner, et al, 2010) described two types of reaction to traumatic stress: overmodulation (inhibition) and undermodulation (arousal) of emotions. The former response types were taken as the basis of dissociation. This view is challenged by supporters of the structural dissociation theory (Van der Hart, Nijenhuis, & Steele, 2006) which proposes that dissociation also appears in positive symptoms (e.g. flashbacks, intrusive memories). While assuming dissociation as the central mechanism rather than a marginal feature of PTSD, these authors propose that Complex PTSD involves a more complex structural dissociation than Simplex PTSD (Van der Hart, Nijenhuis, & Steele, 2005).

From a clinical point of view, dissociation covers a diagnostic spectrum from the mildest to the most severe, covering acute dissociative reactions to stressful events, acute stress disorder, Simplex PTSD, dissociative subtype of PTSD, Complex PTSD, and chronic dissociative disorders such as DID, respectively (Şar, 2011). Besides constituting a disorder on its own, dissociation may accompany several other psychiatric disorders which are known to have etiologies other than psychological trauma; e.g. schizophrenic disorder (Lyssenko, Schmahl, Bockhacker, Vonderlin, Bohus, & Kleindienst, 2018; Şar, Taycan, Bolat, Özmen, Duran, Öztürk, et al, 2010). When it does, concurrent dissociation is usually linked to a history of chronic developmental trauma, independent from the accompanying psychiatric disorder (Şar, & Ross, 2006).

Table 2: Symptoms of Complex Posttraumatic Stress Disorder (PTSD) and Dissociative Subtype of PTSD (Şar, 2011)

Features	Complex PTSD	Dissociative subtype of PTSD
<i>General characteristics</i>		
Core symptoms	“Simplex” PTSD	“Simplex” PTSD
Traumatic stress	Cumulative trauma	Developmental trauma
Psychiatric comorbidity	Almost always	Less common
<i>Specific characteristics</i>		
Additional symptoms	Affect dysregulation, somatization, dissociation (disturbances of sense of self), impulsive and/or self-destructive behavior.	Depersonalization and/or derealization
Dissociation	Not required	Required
“Borderline” features	Common	Less common
<i>Potential correlates</i>		
Sense of agency	Identity confusion and/or alteration	Possession
Sensorimotor dissociation	Somatoform dissociation	Functional neurological symptoms

Conversely, such “true” comorbidity should be differentiated from “syndromal façades” of dissociative disorders on the clinical surface (Şar, 2014,2016). Namely, the clinical surface may imitate or dissimulate such comorbidity through a “phenocopy” created by the symptoms which are common to both dissociative and other psychiatric disorders; e.g. hallucinations, passive-influence experiences, “borderline” features, and mood disturbances. “True” comorbidity requires specific treatment which can not be addressed by solely the treatment of dissociation. Syndromal “façades”, on the other hand, can only be treated by addressing the dissociative disorder. One of these conditions is the “dissociative depression” (Şar, 2011) which is usually resistant to “treatment-as-usual” of depressive disorders (Şar, 2016). The latter is an intermediate condition between true comorbidity and façade (Table 3).

Table 3: Clinical features of “dissociative depression” (Şar,2011; Şar et al., 2013)

Depressive symptoms	Overall condition	Identity fragmentation
Suicidal ideas	Suicide attempts	Associated symptoms of DID (voices hearing etc)
Appetite and weight changes	More severe depression, more psychiatric comorbidity	Borderline personality disorder criteria
Thoughts of guilt and worthlessness	Younger age	Experiences of possession and extrasensory perception
Diminished concentration and indecisiveness	Polytraumatization in childhood	Schneiderian symptoms

The recently proposed “*trimodal model*” of trauma and dissociation (Mutluer, Şar, Kose-Demiray, Arslan, Tamer, Ünal, et al, 2018; Şar, 2019) provides an integrative solution between the “structural theory” and the conceptualizing of the dissociative subtype of PTSD as a condition characterized by overmodulation of emotions only. Actually, the trimodal model assumes that each of the three modes (i.e. acute reaction, chronic trauma illness, and alienation) of response to trauma operates between *two poles*. That is, each mode is characterized by an interaction between trauma-related *intrusions* and processes of *controlling* the psychological pain initiated by the former, in order to keep the tension inside a “window of tolerance” (Siegel, 1999). Dissociative amnesia may operate within all modes (Mutluer et al., 2018; Şar, 2019; see also Schimmenti & Şar, 2019). In addition to amnesia, denial, avoidance, and alienation are phenomena which dampen the pain of mental intrusions. Each of these experiences of omission represent overmodulation of emotions in context of one of the three modes: Denial is covered by the first mode only, avoidance by the second mode, and alienation is considered as the main feature of the third mode. This understanding of coping assumes that amnesia, denial, avoidance, and alienation (the “four horsemen”) are different mechanisms despite their resemblance in the surface. The main difference between them seems to be in “realization” (in fact, “non-realization”) of the experience by modified “ownership” (personalization) and deficient presentification (detemporalization) (Table 4)

Table 4: The “Trimodal Response” to trauma (Şar, 2019)

Components of psychopathology	Mode 1 “Acute Inflammation”	Mode 2 “The Trauma Illness”	Mode 3 “Alienation”
Undermodulation			
Cognition (Knowing and not knowing)	Current and/or lifetime reexperiencing	--	--
Hyperarousal	Lifetime hyperarousal	Current hyperarousal	--
Impaired sense of agency (intruding entities)	--	Passive influence, possession, “borderline” phenomena	Dissociative identities (switching)
Overmodulation			
Cognition (Knowing and not knowing)	Denial, Dissociative amnesia	Lifetime and current avoidance, Dissociative amnesia	“Not me” experience, Dissociative amnesia
Hypoarousal	--	(Dissociative) depression	Depersonalization, Derealization
Impaired sense of agency (avoidant entities)	--	Absorption trance	Dissociative identities (switching)

The tertiary mode (alienation) may represent both state and trait dissociation. In a recent study (Kleindienst, Priebe, Görg, Dyer, Steil, Lyssenko, et al, 2016), state dissociation during psychotherapy sessions predicted improvement after dialectical behavior therapy (DBT) for PTSD: patients with a low dissociative state during treatment had a higher chance to show substantial improvement. This relation consistently emerged across subgroups of PTSD patients with and without borderline personality disorder (BPD). Trait dissociation was not a significant predictor in either direction. Probably, state dissociation more readily interferes with interpersonal communication due to its impact on cognitive abilities. DBT, on the other hand, may have addressed trait dissociation rather successfully. However, the latter requires to be shown empirically.

Alienation as the Basis of Dissociation

Alienation (estrangement to oneself and/or the environment) is the core of dissociation. This is represented in the clinical phenomenon of depersonalization which connotes an impairment of personalization (Jaspers, 2013); i.e. the experience that all psychological faculties (perception, memory, imagination, thought, feeling etc) belong to oneself. This is the basis of the sense of self and agency. Loss of time perception (detemporalization) may also accompany such depersonalization. Janet considered both depersonalization and detemporalization as the core impairment which undermines the experience of realization (Van der Kolk & Van der Hart, 1991); i.e. the true understanding of the meaning of an experience which is necessary for integration.

While alienation in the form of depersonalization is common to all dissociative disorders, switching to or co-existence of alternate personality states is more typical for cases with identity fragmentation. On the other hand, a clinical condition predominantly characterized by or limited to depersonalization and derealization may turn to one of identity fragmentation over time. This usually occurs due to better expression of previously suppressed structural dissociation.

In an empirical study (DePrince, Huntjens, & Dorahy, 2015), alienation was the only cognitive appraisal variable to differentiate DID from PTSD. While the groups had similar appraisals of shame, betrayal, self-blame, anger, and fear, the DID participants had higher appraisal of themselves as experiencing alienation. Indeed, these patients experience depersonalization and derealization which may go back to their childhood (Şar, Alioğlu, & Akyüz, 2017). Put it in simple words, they feel alone, disconnected, and different. They often feel very isolated/lonely experiencing themselves as the only one in the universe who is “different” from others. Even they have difficulties in understanding themselves.

This condition affects the individual two-fold. First of all, abuse and neglect may activate feelings of alienation, isolation, and aloneness. On the other hand, relational support is necessary to constructive processing of specific abuse. If this is not available, the child can not make sense of this experience through narrative that the related affective states are contained. This hinders the integration of the abuse with other autobiographical experiences. In fact, such integrative “metabolization” of the traumatic experience has an interpersonal aspect as psychosocial validation to achieve meaning. Consequently, the representations of abuse/neglect experiences remain mentally isolated. With further incidences and isolation, the child’s ability to develop an ordinary sense of self-in-relation-to-others, based on a coherent narrative which

includes the abuse experiences, is impeded and dissociative identities may begin to form (Şar, Dorahy, & Krüger, 2017). This is the “downward spiral” of trauma.

Not only the perception of the subject about the trauma experience but also the perception of the subject about oneself is affected by this process. The traumatized subject evaluates oneself from the perspective of multiple versions of reality (Bromberg, 1998). The experience may differ after each repetition such that the affected person develops *isolated subjectivities* (Chefet, & Bromberg, 2004). With contribution of dissociative amnesias, such perceptual fragmentations lead to depersonalization, derealization, and identity alterations (Şar, Alioğlu, & Akyüz, 2017; Şar, Alioğlu, Akyüz, & Karabulut, 2014; Şar, Alioğlu, Akyüz, Tayakısı, et al, 2017) because multiple perceptions of reality may destroy personalization, i.e., one’s experience that all psychological faculties (perception, body perception, memory retrieval, imagination, thought, feeling, etc.) belong to oneself (Jaspers, 1913). Depersonalization is the core element of clinical categories which are considered to be trauma-related conditions, e.g., dissociative, borderline personality, conversion, and certain types of depressive disorders (Şar, Alioğlu, & Akyüz, 2017; Şar, Akyüz, Kuğu, Oztürk, & Ertem-Vehid, 2006; Şar, Akyüz, Kundakçı, Kızıltan, & Dogan, 2004; Şar, Akyüz, Öztürk, & Alioğlu, 2013).

Thus, dissociation is a non-interactive solution (Crandell, Morrison, & Willis, 2002) and, as such, may lead to biased processing of social inclusion (Weinbrecht, Niedeggen, Roepke, & Renneberg, 2018). The development of an internal “ghetto” (Frankel, & O’Hearn, 1996) of “alternate identities” leads to the emergence and dominance of relationships in the individual’s internal world. Interpersonal and internal phobias (e.g., phobias of other dissociative identities) then interfere with change, integration and growth (Steele, van der Hart, & Nijenhuis, 2001).

Dissociation and Altered Consciousness

Dissociative individuals may also suffer from alterations of consciousness which are common among patients with trauma histories (Ross & Browning, 2018). Specifically, in their 4-D model of consciousness, Frewen and Lanius (2014) differentiated trauma-related altered state of consciousness (TRASC) from normal waking consciousness (NWC). These two poles of experiencing can be observed in consciousness of time-memory (flashbacks versus intrusive recall & distressful reminders), thought (voice-hearing versus negative self-referential thinking), body (disembodied versus embodied experiences of distress), and emotions (numbing and affective shutdown versus non-dissociative forms of negative emotionality). In fact, all these four dimensions reflect cognitive-emotional and bodily aspects of depersonalization; i.e. alienation, self-detachment, or estrangement (Şar, Alioğlu, & Akyüz, 2017).

Inspired by Pierre Janet, the structural theory of dissociation underlines a “*division of personality*” (“doublement”) or “fragmentation” as the main characteristic of dissociation, while absorption experiences are considered as non-pathological (Nijenhuis, & Van der Hart, 2011; Van der Hart, Nijenhuis, Steele, & Brown, 2004). A recent study by Schimmenti and Sar (2019) proposed that absorption trance was itself also a dissociative phenomenon with strong relationship to hypnotic phenomena (Dell, 2017). In fact, absorption trance is based on the narrowing of consciousness which does not differ from a “division” in the final analysis.

Hence, the definition of “*normative dissociation*” (Şar & Öztürk, 2007; 2013) should be based on lack of “clinical” symptoms rather than on preponderance of certain

allegedly “benign” or “non-pathological” dissociative experiences such as absorption. Moreover, structural theory of dissociation may be applicable to “normative dissociative phenomena” which support the maintenance of the “apparently normal” deficient adjustment to daily life. Indeed, such adjustment may remain unperceived by the subject and his social circle, unless the distinct “action systems” operate in a disorganized or desynchronized manner.

Traumatic Memory as an Internal Driver

The vast proliferation (inflation) of options for mental operations in the aftermath of a traumatic experience facilitates cognitive alienation as well. Such options are usually based on representations of inadequate operations in other past problematical experiences. They are transferred to inactive memory during these repetitions, either partially or totally. From the perspective of time dimension that remain in the past. As perception is embedded in time, while processing the trauma experience, the subject concentrates on the past experience while being in the present (Van der Kolk, & Van der Hart, 1991). This de-doubling of time leads to *detemporalization* (Şar & Öztürk, 2005) because the subject’s contact with the present time weakens.

The repetitions of the representations of these operations in the active memory are attempts to solve the trauma. However, solution scenarios for recurrent traumatic experiences and repeated cognitions detach from each other rather than achieving a convergance. They become autonomous and reveal separate domains. Sar and Ozturk (2005) propose that the excluded operations may lay the foundation for the immediate or future development of *distinct mental states* (Putnam, 1997) or *parallel-distinct mental structures* (Şar, 2017) of dissociative individuals. Mental operations, which are excluded from current processing and are formed to distinct personality states, are then activated as solution in further domains of life problems (Şar & Öztürk, 2005).

The hallmark of trauma resolution is the ability and opportunity of the subject to respond to a traumatic experience adequately. Escape, partial denial, or processing the situation until it is resolved is possible. Inadequate processing of the traumatic experience causes the fact that past trauma is then repeatedly handled in the context of present time in the person’s active memory (Şar & Öztürk, 2005). That’s why, in their “preliminary” publication on traumatized dissociative patients, Breuer and Freud (1893/1999) stated: “*the hysteric suffers mainly from reminiscences*”. The need to match new information with inner models based on older information, and the revision of both until they agree, is called a *completion tendency* (Horowitz, 1986). The completion principle summarizes the human mind’s intrinsic ability to continue to process new information in order to update the inner schemata of the self and the world.

By definition, any change in the perception of traumatic experience leads to the emergence of a new internal and external world; i.e. a change in reality and its perception (Şar & Öztürk, 2005). The organism inquires ways of adaptation to the changes in the real world in the aftermath of the traumatic experience. Trauma is, however and per definition, a threatening experience which turns an adaptive process to a *maladaptive* one (Şar & Öztürk, 2005). This is the condition when upsetting and unpredicted situational and/or enduring factors interrupt the psycho-sociological experiencing significantly, and interfere, for a certain amount of time, with the coping capacity of the person.

Namely, although being disruptive on the perceived continuity of both internal and external “realities”, a traumatic experience is per definition an “event” that contains

a message about the future (Badiou, 2005) on the basis of a new horizon of possibilities generated by the event. Carl Gustav Jung stated once, that the individual is programmed for *uniqueness* in order to perceive oneself as a living entity (Singer, 1994).

Paradoxically, living organisms are also evolved to a capacity of coping by responding to stressors with adaptation (Dhabbar, 2018); i.e. change. Thus, while survival requires a personal update in the aftermath of major changes, it is expected that one keeps his or her unique identity more or less existing (Şar, 2017). This dilemma remains temporarily unresolved in dissociative disorders; i.e. adoption of a new and adapted identity seems to be postponed until a definitive processing of the disruption becomes available (Şar, 2019).

Pain is a signal of the threat to the homeostasis in the context of the supreme mission of survival. Psychological trauma creates *mental pain* which is related to memories, sensations, emotions, and thoughts about the stressful experience. With their painful quality, traumatic memories seem to be the main driver of the “trauma response”. One natural reaction of the organism to pain is avoidance. Hence, the individual is concerned with ways of keeping pain within bearable limits, while preserving its signaling function (Şar, 2019).

The *trimodal response model* (Şar, 2019) is concerned with a proposed model of response to complex psychological trauma and dissociation. Rather than consecutive phases, the response of the individual to developmental trauma is described in three modes which can co-occur: Acute reaction, chronic process, alienation. Each mode operates in a window of overmodulation and undermodulation of emotions. The trimodal model resembles medical conceptualizations of injury, response, and illness as they occur to the body. Psychotherapeutic intervention to trauma-related conditions has to consider the possible co-presence of the three modes. The model tries to cover the mental striving of the traumatized individual to deal with unbearable pain, while fighting for overall survival. Nevertheless, survival has not only physical but also psychological aspects which converge on the maintenance of one’s unique self-identity.

Dissociative Amnesia, Reenactment, and Identity

The concept of identity has a rich history in psychology and social sciences, however, its implications for psychiatry has been relatively little considered. For example, in DSM-5, only two disorders are based on an identity disturbance: DID and borderline personality disorder (BPD). Interestingly, both diagnostic categories are related to childhood adversities (Brand et al., 2016). Moreover, a large descriptive overlap between two disorders has been repeatedly shown (Şar, Akyüz, Kuğu, Ozturk, & Ertem-Vehid, 2006).

While the illumination of the true nature of this descriptive overlap requires further studies, the problem has conceptual aspects as well. Namely, the definition of the boundary between a “personality disorder” and a “dissociative disorder”, or even “any psychiatric disorder” needs to be revisited (MacIntosh, Godbout, & Dubash, 2015). According to the DSM-5, diagnosis of personality disorders should not be made if the condition can be better explained by an other disorder. This rule becomes imperative for the “dissociation-borderline” realm; i.e. for patients who demonstrate the phenomenologies of both disorders. However, there are several options to explain this overlap, which is too common to be a coincidence. Both conditions may be two faces of the same coin; i.e. a trauma-based psychopathology or one condition may lead to the other. In any case, the relationship to “personality” remains obscure if there is any.

Among many other aspects, identity confusion and alteration may be represented by the so-called Schneiderian symptoms among non-psychotic individuals. Rather than being delusions, they constitute passive influence experiences in dissociative disorders; i.e. disturbances of sense of self and agency. Notwithstanding the large descriptive overlap between two conditions, Schneiderian experiences represent mainly mental intrusions from “within”, while features of BPD seem to constitute representations of a dissociative “inner space” in the external (i.e. interpersonal) world. Thus, subjects with BPD are known to “divide” external world by “splitting and projective identification” (in fact, they are mechanisms of strong dissociative quality), while dissociative individuals perceive themselves as “divided”. Little is known about the role of absorption trance in these dynamics (Schimmenti & Şar, 2019). A recent study conducted on a Chinese college population demonstrated that dissociative, BPD, and Schneiderian symptoms were different, but highly inter-related dimensions of psychopathology (Fung, Ling, Ross, Tse, & Liu, 2019). Nevertheless, both conditions may still represent two faces of the same coin.

A series of studies conducted in a college population (Şar, Alioğlu, & Akyüz, 2017; Şar, Alioğlu, Akyüz, & Karabulut, 2014; Şar, Alioğlu, Akyüz, Tayakısı, et al, 2017; Şar et al., 2006) propose that both dissociative amnesia and diminished awareness (e.g. denial of the experience or idealization of the perpetrator) about childhood trauma may affect the way patients express their unresolved mental processing on the borderline-dissociation spectrum. In these studies, discrepancies between self-report and clinical assessment led to important insights about relationships between childhood trauma, disturbances of memory, and core dimensions of dissociative psychopathology. Amnesia to symptoms and/or childhood trauma or perceptual alterations seemed to explain these discrepancies. Self-report measures were more sensitive than clinician-assessment except for patients with dissociative disorders who had “amnesia to amnesia” in their self-report assessment. The latter phenomenon describes the lack of awareness of dissociative individuals about their amnesias. Unlike dissociative disorders and alongside clinical assessment, BPD was associated with self-reported amnesia as well (Şar, Alioğlu, Akyüz, & Karabulut, 2014). Thus, the main difference between the two diagnostic categories was in “awareness about amnesia”. (Table 5)

In self-report, both disorders were associated with “cognitive-emotional self-detachment” but only BPD was associated with “detachment from reality” (Şar, Alioğlu, & Akyüz, 2017); i.e. beside awareness of amnesia, and being a dimension of derealization, detachment from reality seemed to discriminate BPD from dissociative disorders. It was correlated with total childhood trauma as well. However, such correlation with childhood trauma was not observed for clinician-assessed derealization. Similar to detachment from reality, self-reported identity alteration was correlated with all childhood trauma types, however, in clinical assessment, it was correlated with childhood sexual abuse only (Şar, Alioğlu, Akyüz, Tayakısı, et al, 2017). Thus, self-report instruments seemed to be more sensitive than clinician administered assessment in demonstrating the relationship between childhood trauma, derealization, and identity alteration. This may be due to the basically subjective quality of experiences of derealization and identity alteration. Additionally, the presence and intervention of an interviewer may blockade the “flow” of expression upon questions due to factors such as shame and basic mistrust. Childhood sexual abuse seemed to be the most harmful type of childhood trauma in terms of its relationship to identity disturbance on BPD-dissociation spectrum (de Aquino Ferreira, Pereira, Benevides, & Melo, 2018).

Table 5: Differences between borderline personality disorder and dissociative disorder in self-report and standardized clinical interview

Components of assessment	Specific to borderline personality disorder	Common to both disorders	Specific to dissociative Disorder
Detachment	Detachment from reality in self-report (correlated with total childhood trauma score)	Cognitive-emotional self-detachment in self-report	
Identity alteration		Present in self-report	Present in clinical assessment (correlated with childhood sexual abuse report)
Amnesia	Present in self-report	Present in clinical assessment	Not present in self report (amnesia to amnesia)

Disturbed Interpersonal Attachment, Betrayal, and Denial

Another study demonstrated that BPD criteria as seen among patients with DID, were culture sensitive. Specifically, in a comparison of Turkish and Dutch patients with DID, large differences existed between the two groups in meeting BPD criteria (Boon & Draijer, 1993; Şar, Yargıç, & Tutkun, 1996). Indeed, Dutch patients reported frequent mood swings, physically self-damaging acts, identity confusion, and impulsive and unpredictable behavior more frequently than Turkish patients. These phenomena pointed to the preponderance of affect dysregulation and disturbances of sense of self and agency, and to a possible role of abusive experiences. In turn, Turkish patients reported intense anger and lack of control of this emotion, chronic feelings of emptiness and boredom, efforts to avoid abandonment, and intense but unstable relationships more frequently than Dutch patients. These differences pointed to the predominance of attachment disturbance among Turkish patients and possible role of childhood neglect (Table 6).

This is why (with its sensitivity to rejection) BPD appears to be an attachment disorder. As much as culture, differences in traumatic antecedents may have also played a role in explaining the different prevalence of these distinct patterns in the two cultures. In another study, and possibly as an indicator of the importance of relational issues in the local culture, Turkish adolescent outpatients with dissociative disorders differed from non-dissociative psychiatric outpatients in respect to the increased prevalence of concurrent separation anxiety disorder (Şar, Önder, Kılınçaslan, Zoroğlu, & Alyanak, 2014).

Table 6: Borderline personality disorder features which dominate the clinical condition of Turkish and Dutch patients with dissociative identity disorder: a comparison (adapted from Şar et al., 1996).

	Turkish	Dutch
Affect	Intense anger and lack of control of anger	Frequent mood swings
Sense of self	Chronic feelings of emptiness and boredom	Identity confusion
Emotion regulation	Efforts to avoid abandonment	Physically self-damaging acts
Behavioral regulation	Intense but unstable relationships	Impulsive or unpredictable behavior

Some data and theories suggest that disorganized attachment style may facilitate the development of dissociative disorders (Barach,1991; Blizard,2003; Byun, Brumariu, Lyons-Ruth, 2016; Liotti, 2004;2006; Lyons-Ruth, Dutra, Schuder, & Bianchi, 2006; Sachs,2019). Bowlby (1969/1982) proposed that inadequate care-seeking interactions with primary caregivers could lead the infant to develop multiple internal representations of the self and attachment figures (which he called Internal Working Models; IWM). Contradictory IWM's develop to represent the caregiver as dangerous and safe at the same time. Early onset abuse and/or neglect by a relational figures is associated with disorganized attachment (Liotti,2004). Main and Hesse (1990) identified disorganized attachment developing from a relational context where the child, who is seeking for safety and comfort, is frightened by the caregiver. The child may also frighten the insecure caregiver which may impede connection.

“Betrayal trauma” (Freyd,1994) is the trauma which is perpetrated by someone the victim relies on, e.g., by a primary caregiver. Betrayal trauma theory suggests that dissociative amnesia is an adaptive response to childhood abuse that allows for survival by enabling the child to maintain attachment to an abusive figure who is also vital to his or her development. A recent study by Kaehler and Freyd (2009) found that higher betrayal traumas are associated with greater “borderline” characteristics which are common in DID as secondary features which do not necessarily point to an underlying personality disorder (Şar, Alioğlu, Akyüz, Tayakısı, et al, 2017; Şar, Alioğlu, & Akyüz,2017; Şar, Alioğlu, Akyüz, & Karabulut, 2014; Şar, et al, 2006). Betrayal trauma is common in family systems which are characterized by secrets and denial (Goldsmith, Freyd, & DePrince, 2012).

Not only the pain related to the traumatic experience itself, but also amnesia for experience or its denial or minimization are also part of the clinical problem. Such diminished awareness, as depicted by the Janetian concept of “lack of realization”, may lead to either “return of the dissociated”, or to diminished sense of self and agency as represented by identity confusion and alteration (e.g. Schneiderian passive influence phenomena), depersonalization-derealization, and absorption trance.

Clinical studies have demonstrated that at least a subgroup of patients tend to minimize the traumatic quality of their childhood (MacDonald et al., 2016). Patients with conversion and dissociative disorders (Şar, Akyüz, Kuğu, Ozturk, & Ertem-Vehid, 2006; Şar, Akyüz, Kundakçı, Kızıltan, & Doğan, 2004), mothers of children with

masturbatory behavior (Mutluer, Necef, Eray, Kaçar, & Şar, submitted), and individuals who report fear of happiness (Şar, Türk, & Öztürk, 2019) are among them. This observation may be related to a relatively blank response (e.g. dissociative amnesia and absorption) due to the “betrayal” (Freyd, 1994) in the ongoing attachment (Freyd, DePrince, & Zurbriggen, 2001).

In a neuroimaging study conducted on adolescents with PTSD due to childhood sexual abuse (Mutluer et al., 2018), earlier age and a more severe type of childhood sexual abuse (i.e. involving coitus) was associated to a larger left anterior cingulate, while the opposite was observed for sexual abuse by a perpetrator in a closer relationship with the victim. Those adolescents who were sexually abused by their biological father or brother reported more dissociative amnesia and absorption, compared to that of the victims of other perpetrators. However, there was no correlation between specific or total childhood trauma scores and brain volume. An earlier study could not determine the relative importance of specific types of events in neurobiological variables (Cohen, Grieve, Hoth, Paul, Sweet, Tate, et al, 2006). Hence, these neurobiological and psychological phenomena may serve for stress alleviation by facilitating the “attachment to the perpetrator” who was also a “caretaker” (Ross, 1997). However, such alterations in perception of trauma lead to ponder on principles of reality regulation in stressful conditions.

Earliest Developmental Traumatization

Regulation of reality perception requires consideration of the mutuality between the internal and the external world (Şar, 2017). Childhood abuse, neglect, and insecure attachment disrupt this balance such that internal reality becomes more compelling. From a developmental point of view, in order to establish a balance between the external and the internal world, the caregiver’s adequate *mirroring* is necessary. That means, the caregiver’s responses should accurately match the infant’s mental state (Table 7).

The equation of internal and external world which typifies toddlers’ and preschoolers’ way of thinking is called *psychic equivalence* (Fonagy, Gergely, Jurist, & Target, 2002). This mode does not allow consideration of alternative perspectives on reality. Hence, a fantasy may be experienced as potentially real. This is why the acquisition of a sense of pretend in relation to mental states is essential. In *pretend mode*, thoughts and feelings can be envisioned and talked about, but they do not correspond to real. Otherwise, the subject is bound with a black and white type of perception of reality as observed in teleological mode. This restricts the symbolic-associative thinking and even undermines sense of humor in certain conditions. Namely, the *teleological mode* (i.e. the opposite of the pretend mode) is based on imputing intention from what is physically apparent.

Experiencing internal reality both in psychic equivalent and pretend modes is typical for dissociation as seen in all types of dialectical mental operations; e.g. the “dissociation paradox” (Şar, et al, 2012). Namely, compared to other non-psychotic psychiatric disorders, individuals with a dissociative disorder have elevated self-certainty which is a reason of delusional thinking in psychotic disorders if combined with diminished self-reflection. As the latter is not disturbed in dissociative disorders, the increased self-certainty does not lead to loss of cognitive insight which is empirically defined as the difference between self-reflection and self-certainty.

Mentalization is a construct which provides hints about the developmental and interpersonal origins of perception of reality (Fonagy, & Allison, 2012). It is defined as the ability to understand the mental state of oneself or others, that underlies overt behavior. There is a relationship between development of mentalization capacity and experiences of mirroring with the caregiver. For example, if the caregiver is not able to express an affect while indicating she is not expressing her own feelings (*unmarked* mirroring), the child would perceive the response of the caregiver as the mirroring of his or her (i.e. the child's) affect. This would mean that the caregiver's expression may seem to externalize the infant's experience and may overwhelm the infant. Such a breach of the window of tolerance would make the response of the caregiver contagious and would lead to escalation of the affect rather than to regulate the child's state (Gergely, & Watson, 1999). Moreover, a predisposition of experiencing emotions through other people might be established by this early interpersonal template (Fonagy, Gergely, Jurist, & Target, 2002). This is the first step leading to emotional dysregulation which further affects perception of reality.

In a recent study (Ensink, Bégin, Normandin, Godbout, & Fonagy, 2017), child mentalization partially mediated the relationship between childhood sexual abuse and depressive symptoms. The effects of childhood sexual abuse on externalizing symptoms and sexualized behaviour difficulties were sequentially mediated through mentalization and dissociation. Not rarely, families with dysfunctionalities such as, for instance, affect dysregulation among family members, may also be developmentally traumatizing for the offsprings (Öztürk & Şar, 2005). Based on the assumption that very early traumatization has a critical role in dissociative disorders, a prospective study documented that childhood neglect is a significant predictor of dissociation in early adulthood (Ogawa, Sroufe, Weinfield, Carlson, & Egeland, 1997).

Table 7: Types of developmental traumatization

Years of age	Intrusion	Omission	Psychopathology
Cognitive-emotional trauma			
0-2	Unmarked mirroring	Lack of mirroring	Isolation, insecure attachment, cognitive-emotional depersonalization
2-10	Emotional abuse	Emotional neglect	Disorganized attachment
Bodily trauma			
0-2	Embodied intrusion	Embodied detachment	Bodily depersonalization
2-10	Sexual and physical abuse	Physical neglect	Somatic dissociation

Covert Trauma and “Apparently Normal” Families

Recent research underlines the importance of the context (e.g. family) where specific types of abuse and neglect occur (Öztürk & Şar, 2005). Moreover, dissociative disorders may be associated with traumatization that is covert, such as enduring dysfunctional communication and relationship styles in family members, including subtle forms of emotional neglect. Krüger and Fletcher (2017) demonstrated that self-

reported emotional neglect by biological parents or siblings in childhood was the strongest individual predictor of an adult diagnosis of a dissociative disorder in psychiatric patients (out of all other combinations of abuse type and abuser-abused relational bonds).

Dysfunctions in the family may partly originate from parents' own traumatic antecedents which lead to inter-generational transmission of developmental stress as reported in the context of the "apparently normal (dissociative) family" by Öztürk and Şar (2005). In their empirical study, family members of patients with DID and related dissociative disorders reported frequent mood swings, intense anger and inability to control anger, transient dissociative experiences or paranoid ideas, and identity confusion more frequently than controls. Some of these features were correlated with certain types of childhood trauma in this group. For example, frequent mood swings were associated with all types of childhood trauma except sexual abuse (probable role of dissociative amnesia to the latter?) and identity confusion was correlated with emotional abuse.

A study conducted on a large group of college students (Şar, et al, 2006) demonstrated that, not only emotional neglect but also *minimization (denial) of childhood trauma* predicted a dissociative disorder diagnosis. Systemic denial of multigenerational childhood trauma and betrayal may be an important characteristics of "apparently normal" families. One type of hidden childhood trauma is overcontrol which may be disguised by the "overprotection" type of parenting (Hernandez, Gallardo-Pujol, Pereda, Arntz, Bernstein, Gaviria, et al, 2013). While some of the children and adolescents are capable to escape from such oppressive practices, the seemingly positive (i.e. "excess" of love, the intention of protection against perceived "threats") motivation behind this attitude may make the realization of the "danger" by the offspring rather difficult. Additionally, such "intrusive" practices usually lead to "overcontrol" which is sometimes combined with omissions (i.e. neglect) in other contexts which is perceived as inconsistency (i.e. betrayal) by the offspring. Undermining the development of a healthy psychological autonomy and growth, a symbiotic coupling between generations may settle over time which may extend to the adulthood of the offspring. Such developments may be built on attachment disturbances.

In such families with subclinical dissociative characteristics, individuals can interchange their social roles over time, alternating between being a victim, the abuser, and the rescuer (Ross, 1997). Depending on their own traumatic past, or on their current interaction between each other and with their children, the parents may maintain trust and present themselves in a positive role ('angelic', affectionate/compassionate parent), but they can turn to an abusive parenting style (angry, aggressive, insistent) at any time. The changing attitudes of their parents and the marital discord will often cause contradictory feelings within the children. Family members often feel trapped, first being unable to leave in the midst of a crisis as it is not safe. Then, they do not leave the family when the crisis is over and the need to escape has vanished, as the atmosphere becomes less threatening and more settled. Third, in an environment of neglect, chaos may be an opportunity for making contact with others in the unit (Öztürk & Şar, 2005). Upon direct traumatization early in life, the ever-changing roles in an enduring family system continue to push children and adolescents towards a dissociative adaptation style in a period sensitive to the establishment of a stable identity.

Dissociation in Childhood and Adolescence

Adolescents are known to be dissociation-prone as children are. Moreover, they are directly faced with the developmental task of solving their normative identity crisis through integration (Alexander & Schaeffer, 1994; Allen, Fultz, Huntoon, & Brethour, 2002; Carlson, Dalenberg, Armstrong, Daniels, Loewenstein, & Roth, 2001; Dalenberg, Brand, Gleaves, Dorahy, & Loewenstein, 2012; Howell & Blizard, 2009; Putnam, 2006, 2016). Ironically, studies on dissociative disorders in children and adolescents are in their infancy; i.e. they lag behind those on adult survivors of childhood adversities (Putnam, 1997). In fact, one of the rare diagnostic screening studies shows that the highest prevalence of dissociative disorders is seen among adolescents (Şar, Önder, et al, 2014). Another Turkish study on adolescents showed that each type of trauma and dissociation contributed to suicide attempts and self-mutilation (Zoroğlu, Tüzün, Şar, Tutkun, Savaş, Öztürk, et al, 2003). Dissociation was the most powerful predictor. A recent metaanalysis documented that childhood maltreatment - except for emotional neglect- predicted self-mutilative behavior (Liu, Scopelliti, Pittman, & Zamora, 2018).

Children and adolescents are disadvantaged compared to adults in term of conceiving and reporting their dissociative experiences in an understandable way as they usually lack the required armamentarium of communication. Nowadays, increasing accessibility to internet resources may started to open the ways of correct understanding of their suffering for adolescents. Anecdotal experiences on children and adolescents reveal that certain types of alternate personality states are common which are relatively difficult to detect due to their resemblance to normative behavior of child and adolescent. They may also imitate diagnostic categories which keep dissociative psychopathology hidden behind a clinical surface: e.g. major depressive disorder, disruptive dysphorical mood disorder, attention deficit hyperactivity disorder, reactive attachment disorder, or oppositional defiant disorder (Bozkurt, Düzman-Mutluer, Kose, & Zoroglu, 2014; Fujisawa, Shimada, Takiguchi, Mizushima, Kosaka, Teicher, et al, 2018; Şar, Önder, et al, 2014).

Among such types of alternate personality states, those characterized by an emotion, an experience of possession, personality states with identical age and/or name, or imaginary companion are common among adolescents. Switching experiences of children and adolescents may also remain unrecognized by general label of regressive and angry behavior. Children with alternate personalities which are restricted to certain emotions (e.g. anger) may get the diagnosis of disruptive dysregulated mood disorder or bipolar mood disorder in adolescents which may lead to inaccurate and ineffective pharmacotherapeutic strategies. Upon newly prescribed antidepressant and/or antipsychotic medication, immediate switching to a cheerful personality state may resemble a hypomanic response to pharmacological intervention which may have occurred in the aftermath of a “dissociative depression” (Şar, 2011). Delienation of a new category of “dissociative mood disorder” may be considered for future research among children and adolescents in particular.

As seen in Japanese hikikomori (i.e. apparently a chronic dissociative disorder usually with an onset in adolescence), placement of the dissociative psychopathology in culture-bound domain by rupturing its association with general trauma-related psychopathology may hinder the access to proper treatment (Hattori, 2006). This condition characterized by social withdrawal of the offspring of “apparently normal” middle and middle-upper class families is characterized by a history of emotional neglect. These cases seem to have “dual personality” type of DID covering an

“unemotional” and “apparently normal” host personality state occasionally switching to an “emotional” and “angry” personality state with persecution of the possibly “hard-working” and “neglectful” parents. Childhood sexual abuse histories typical for many other cultures are lacking in these cases which underlines the equal importance of other developmental adversities in dissociative disorders.

Society and Culture as Origin or Context of Trauma

Most clinicians agree on the importance of contextual factors which operate in the environment of the subject exposed to traumatic experiences. Such factors either accentuate the impact of the experience and/or constitute a social network which fails in providing the support the subject needs to overcome the threat. Thus, the controversy between the so-called “socio-cognitive” and “trauma” theories of dissociation is useless because these perspectives are two faces of the same coin. In fact, trauma emerges in the context of socio-cognitive factors (Şar, Krüger, Martinez-Taboas, Middleton, & Dorahy, 2013). One culture-sensitive aspect of dissociation is the dissociative somatic phenomena and indeed their prevalence varies in various parts of the world (Martinez-Taboas, Lewis-Fernandez, & Şar, 2018).

Although childhood abuse and neglect require the presence and actions of “perpetrators”, they can occur only in a suitable environment. This environment is characterized by denial, boundary violations, reality distortions, paranoia, narcissism, and dramatic posturing which usually serve the purpose of maintaining the family structure. These features and dynamics may derive from psychological, relational and economic needs of one or both of the parents, as well as oppressive traditions which do not allow a dissolution of marriage, and other contextual issues in the family (Gold, 2000).

Cultural processes influence the development and phenomenology of dissociative disorders (Dorahy, 2001; Krüger, 2016). The role of culture may be divided in two components: as the origin of trauma and as a modifier of the disorder expression. To explain the interface between society and the individual, Şar and Öztürk proposed the concept of “*sociological self*” (Şar & Öztürk, 2007). Krüger, Sokudela, Motlana, Mataboge, and Dikobe (2007) underlined the inevitability of dissociation to live in an oppressive and constantly traumatizing community. Gold (2004) depicts dissociogenic aspects of contemporary societies and Şar and Öztürk (2013) describe how they are misused as a tool of oppression. These theories and models provide the underpinnings to the concept of “normative dissociation”.

Last but not least, DSM-5 recognizes conditions related to organizational abuse such as consequences of coercive persuasion, cult attendance, terror organizations as identity disturbances. They are listed among other specific dissociative disorders. Empirical research is very limited on this neglected area of dissociation while the sociocultural burden of such aberrations are devastating in many societies. Not only participants of cult-type organizations, but also individuals showing sudden violence (“individual cult”) while living in seemingly good psychosocial adjustment or those who “deliberately” join such malignant organizations (“Stockholm Syndrome”) are suspect of such dissociative psychopathology, although they may not show overt clinical presentations (Şar, 2015). According to the theory of “functional dissociation of the self”, this is an appearance of a malignantly hypertrophied sociological self detached from one’s psychological self which is underdeveloped upon such detachment beginning from early years of life on.

Neurobiology of Dissociation: Orbitofrontal Hypothesis

A structural MRI study established that DID patients have smaller hippocampi and amygdalae compared to normal controls (Vermetten, Schmahl, Lindner, Loewenstein, & Bremner, 2006). Ehling et al. (2007) also found reduced volumes in the parahippocampal gyrus of individuals with DID and strong correlations between reduction of parahippocampal volume (as compared to healthy subjects) and both cognitive-emotional and sensori-motor dissociation. In two SPECT studies, DID patients in “host” identities exhibited orbitofrontal hypoperfusion in comparison to normal controls (Şar, Ünal, Kızıltan, Kundakçı, & Öztürk, 2001; Şar, Ünal, & Öztürk, 2007). There were no significant differences between perfusions obtained when the patient was in control of different alter personality states (Şar et al., 2001). Bilaterally increased perfusion in prefrontal regions and occipital areas was also observed in one of these studies (Şar, Ünal, & Öztürk, 2007). In the other one, increased perfusion in the left (dominant hemisphere) lateral temporal region was shown compared to healthy controls (Şar et al., 2001). This lateralization was not replicated in a follow-up study (Şar et al., 2007).

Notwithstanding the possible effect of psychiatric comorbidity as a confounding factor (hence, it can not be considered as specific to DID), the findings concerning orbitofrontal hypoperfusion do not seem to be at odds with the theoretical understanding of developmental neurobiology. Longitudinal neuroimaging studies suggest that the orbitofrontal cortex is one of the last regions in the brain to fully develop in humans (Shore, 1996). For example, a tensor-based morphometry investigation indicated that orbitofrontal cortex volumes were smaller in children who have suffered early aberrant parental care in the form of physical abuse, and that these volumetric alterations were associated with difficulties children experience in various aspects of their social lives (Hanson, Chung, Avants, Shirtcliff, Gee, Davidson, 2010). The orbitofrontal cortex is a key component of a circuit that facilitates adaptation to changing environmental contingencies and plays an important role in the control of emotion and motivational states. In this regard, Schore (1996) reported that there is a relationship between the development of the orbitofrontal cortex, emotion regulation, and attachment.

In accordance with these observations and based on a neurodevelopmental approach, Forrest (2001) proposed an “*orbitofrontal model*” for DID which integrates and elaborates on theory and research from four domains: the neurobiology of the orbitofrontal cortex and its protective inhibitory role in the temporal organization of the behavior, the development of emotion regulation, the development of the self, and experience-dependent maturation of the orbitofrontal cortex. This model hypothesizes that the orbitofrontal cortex plays a critical role in the development of distinct mental states (i.e., dissociative identities) due to its inhibitory functions.

Lateralization and Connectivity

Possibly in concert with right hippocampus and anterior cingulate in “remembering” traumatic memories, *right* amygdala seems to be the main driver of the post-traumatic process; i.e. re-experiencing, avoidance, and hyperarousal (Table 3). This pattern clearly represents the basic phenomenology of Simplex PTSD. Representing operations of control, denial of trauma was associated with thinner *right* prefrontal cortex and larger *right* thalamus which may dampen the perception of psychological pain (Mutluer, et al, 2018). The size of the *right* amygdala was also

correlated with depression, passive influence experiences, absorption trance, and negative affect intrusions (Mutluer, et al, 2018; DePierro, D'Andrea, Frewen, & Todman, in press) which seemed to represent Complex PTSD and “dissociative depression” (Şar, Akyüz, Öztürk, & Alioğlu, 2013). This pattern suggested the dominant role of *right* hemisphere in post-traumatic process; i.e. the presence of a sort of *lateralization*.

Schore (2009) stated that “the right brain is fundamentally involved in an avoidant-defensive mechanism for coping with emotional stress, including the passive survival strategy of dissociation”. Mutluer et al. (2018) pointed to the bilateral but asymmetrical impact of PTSD on the brain with a predominant role of the right hemisphere in primary and secondary modes of post-traumatic reaction; i.e. acute and chronic response of Simplex or Complex PTSD type. Left prefrontal cortex was involved with symptoms representing dissociative subtype of PTSD or DID. Thus, unlike proposed by Shore, *core symptoms of dissociation were proposed to be related to the left brain hemisphere*, and in particular, to the *left prefrontal cortex*. In contrast to the general volume decrease in other brain structures, thickness of the *left prefrontal cortex* was correlated with dissociative phenomena, suggesting a possible neuro-protective phenomenon.

Denial (thinner right prefrontal cortex), *avoidance* (smaller right amygdala), and *alienation* (thicker left prefrontal cortex) seem to have different neurobiological associations (Mutluer, et al, 2018). Representing the distinctness of the components, volumetric abnormalities in these regions were not correlated. Interestingly, both right and left *prefrontal cortex* were involved with *altered awareness* of traumatic experiences but not with symptoms of PTSD (see also Depue, Curran, & Banich, 2007). Subcortical structures seemed to be more involved with re-evaluation of reality as triggers., denial seemed to represent the worst scenario and was related to a thinner right prefrontal cortex.

Some of the studies on neurobiological effects of childhood adversities suggested diminished connectivity between the two hemispheres or different areas of the brain. For example, decreased right/left cortical integration has been proposed as associated with childhood sexual abuse and/or physical abuse (Teicher, Ito, Glod, Schiffer, & Gelbard, 1994). Corpus callosum is the major neural pathway that connects homologous cortical areas of the two cerebral hemispheres both in an excitatory and inhibitory role (Bloom, & Hynd, 2005). The total corpus callosum area of the abused/neglected patients was smaller than in controls and psychiatric patients who had not been abused or neglected (Teicher, Dumont, Ito, Vaituzis, Giedd, & Andersen, 2004). Sexual abuse was the strongest factor associated with reduced corpus callosum size in girls. In a diffusion tensor imaging (DTI) study, adolescents with childhood sexual abuse-related PTSD showed decreased fractional anisotropy (i.e. white matter integrity) in the corpus callosum (Rinne-Albers, Van Der Werff, Van Hoof, Van Lang, Lamers- Winkelman, Rombouts, et al, 2016). Abnormalities in the integrity of the corpus callosum were related to anger. Another DTI study documented significantly decreased fractional anisotropy in right anterior corona radiata of dissociative patients (Basmacı-Kandemir, Bayazıt, Selek, Kılıçaslan, Kandemir, Karababa, et al., 2016). An association between bad paternal relationships and lower fractional anisotropy in the genu of the corpus callosum was shown in female patients who were maltreated by their fathers.

These findings on the neurobiological consequences of childhood trauma may have implications for dissociative disorders. For example, Farina, Speranza, Dittoni, Gnoni, Trentini, Vergano, et al, (2014)) demonstrated that, compared to controls,

dissociative individuals did not show an increase in EEG connectivity after administration of an interview triggering memories of early attachment; i.e. the brain's overall response lacked the integrative reaction shown in healthy controls. Accordingly, a recent study (Soffer-Dudek et al., 2019) also demonstrated decreased EEG connectivity in dissociative absorption, which was considered as a type of trait dissociation.

Considering both findings on lateralization and connectivity, Mutluer et al. (2018) study led to the speculation that diminished connectivity may be part of the “protective” response among traumatized adolescents to “quarantine” the left hemisphere while the right hemisphere was operating in “frontline” (Depue, Curran, & Banich, 2007; Şar, 2019), at least through adolescence. Such lateralization seems also to point to the central role of the “right brain” in processing the interrupted trauma resolution with particular emphasis on memory and emotions. Although thicker left prefrontal cortex is not an absolute neurobiological marker of mental health, the obvious relationship between psychopathology and the downsizing of all evaluated brain regions in PTSD supports this proposal. On the other hand, a particular role of the left brain in dissociation may also point to a difference between PTSD and dissociative disorders in this respect. Namely, lateralization seems to be a phenomenon related to PTSD while dissociative disorders may be accompanied by bilateral response of the brain. Further research would shed light to potential accuracy of these speculations.

Integration as Healing: Conclusive Remarks

Considering the perspective provided by the elaborations in this paper, a definition of dissociation may be as follows: traumatic experiences and consequently altered self-perceptions contribute to the impairment of the mutuality between internal world and external reality (Şar, 2017, 2019). This is accompanied by a renewed perception of the self in the context of a different reality, accompanied by altered vigilance, awareness, control (agency), and concentration. Depersonalization is the core clinical element of this condition.

Understanding the etiology of dissociative disorders requires integration of trauma-exposure, coping, cognitive, neurobiological, systemic, and developmental factors. These include not only traumatic experiences, but also family dynamics, child development, and attachment (Freyd, 1994; Kluft, 1993; Putnam, 2006). Dissociative disorder develops when a child is exposed to chaos, coercion, and overt severe physical and/or sexual abuse, or alternatively, to “apparently normal” dissociative families often with subtle neglect, disorganized attachment to caregivers, emotion dysregulation, and misattuned communication styles (Krüger, 2016). Overwhelmed by intense conflicting needs and emotions, the child is unable to integrate discrete behavioral and emotional states into a coherent or relatively integrated self according to the appropriate socio-cultural construction of self (Putnam, 2006; Schimmenti & Caretti, 2016). While the role of the child's biological capacity to dissociate to an extreme level is yet unclear, there is evidence demonstrating the neurobiological impact of developmental stress. The latter converges around an impairment of connectivity in the central nervous system in affected individuals.

The possibility of successful treatment (“restitutio ad integrum”) of dissociative disorders by means of psychotherapy (Brand, Classen, McNary, & Zaveri, 2009) even at a later time in life, and the probable positive natural course of dissociative disorders in a subgroup of adolescents (Şar, Önder, et al, 2014), support the possible role of

dissociation in mental survival (Şar,2019; Şar &Öztürk,2007; Ross, Goode, &Schroeder,2015). Traumatic memories do not only seem to be drivers in the psychopathogenesis of post-traumatic conditions, but their processing also seem to serve to re-establish the sense of self and agency (Conway, 2005; Öztürk &Şar, 2016a,2016b; Prebble, Addis, &Tippett, 2013). Even disturbances of attachment can not be repaired solely by a good therapist-patient relationship, unless some trauma processing occurs in this context (Schimmenti &Caretti,2016).

Researchers agree on the significant role of connection between amigdalae and the frontal lobes in PTSD (Gard, Waller, Swartz, Shaw, Forbes, & Hyde,2018; Lobo, de Oliveira, David, Pereira,Volchan, Rocha-Rego, et al, 2011). Individuals with childhood trauma have inhibitory failure and frontal lobe dysfunction in regions related to Nogo-P3 in EEG (Kim, Kim, Jin, Im, & Lee, 2017). Hence, interactions between frontal lobe and amygdala seems to be crucial in the establishment of mental integration. However, this connection seems to be more complex than a simple balance between and excitatory and inhibitory functions (Solms, & Panksepp, 2012). For example, with its role as a “hub” embedded in numerous structures of the limbic system alongside its contribution to the integration of emotion, perception and cognition (including memories of past autobiographical events), amygdala does not only play a role in intrusive phenomena, but it also forges the establishment and maintenance of an integrated self (Markowitsch, & Staniloiu,2011).

Both studies on connectivity and lateralization inspire treatment methods such as Eye Movement Desensitization and Reprocessing (EMDR), which covers bilateral stimulation of the brain (Laugharne, Kullack, Lee, McGuire, Brockman, Drummond, et al, 2016) and neurobiologically informed mindfulness therapies adressing inter-hemispheric balance (Siegel,1999). However, those and other methods should always be embedded in the larger context of trauma psychotherapy; e.g. phase-oriented based on stabilization, trauma work, and integration (Van der Hart, Nijenhuis, &Steele, 2006). Maintenance of a good balance between overmodulation and undermodulation of emotions throughout treatment (Lanius et al., 2010), and consideration of alterations of consciousness to manage perceptual alterations (Frewen, & Lanius, 2014) are essential to fit the requirements of an orchestration as proposed by the mode-oriented approach (Şar,2019). Last but not least, the illumination of the role of autonomous nervous system dysfunction in dissociation may open ways to better psychotherapy and even pharmacotherapeutic management of these conditions.

These consideration would not be complete without a renewed definition of integration as ultimate goal of psychotherapy in dissociative disorders. Thus, integration takes place by *letting the individual perceive oneself as oneself in the face of each of the diverse psychological realities, while developing sociopsychological connections between each of these psychological realities and kernels of the self* (Bromberg, 1998; Şar,2017).

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