Abstract  Conceptually, the term dissociation means alteration of subjective experiences in perceptual, affective, memory, and identity functions in response to stress. The presentations of dissociative disorders may include distorted sensory perceptions, altered time perception, amnesia, conversion symptoms, derealization, depersonalization, fugue states, and multiple personality disorder, in isolation or in combination. Dissociation has also shown to serve major defensive roles; has psychoanalytic and neurobiological underpinnings. It has been shown that dissociation has a developmental basis beginning right from infancy (as seen in relation to attachment theory). Until recently there has been little research in this area. In this chapter we shall focus on how the concept of dissociation has evolved, addressing the defensive functions of dissociation, neurobiological characteristics particularly the developmental basis of dissociation.

Keywords  Dissociative Disorder · Defense mechanisms · Neurobiology · Development · Attachment Disorders
Abbreviations

DID  Dissociative Identity Disorder
MPD  Multiple Personality Disorder
ICD  The International Classification of Diseases
DSM  Diagnostic and Statistical Manual of Mental Disorders
MRI  Magnetic Resonance Imaging
FDG-PET  Fluorodeoxyglucose-Positron Emission Tomography
PTSD  Posttraumatic Stress Disorder

2.1 Introduction

In a normal child, the consciousness, memory, identity, emotion, perception, body representation, motor control and behavior are integrately organized; there is a considerable degree of conscious control over the memories and sensations that can be selected for immediate attention and the movements to be carried out. However, in a child with dissociative disorders is a partial or complete loss of integration between memories of the past, awareness of identity, immediate sensations, and control of bodily movements; and ability to exercise a conscious and selective control is impaired, to a degree that can vary from day-to-day or even hour-to-hour (ICD 10). When memories are poorly integrated, the resulting disorder is dissociative amnesia; fragmentation of identity results in dissociative identity disorder; disordered perception yields depersonalization/derealization disorder.

Dissociative disorders represent more disturbances in the organization or structure of mental contents than a disturbance in the contents themselves. Memories in dissociative amnesia are not so much distorted as they are segregated from one another; the aspects of the self that are fragmented in Dissociative Identity Disorder (DID) are two-dimensional aspects of an overall personality structure. The problem is the failure of integration of information, rather than the contents of the fragments. Hence, all types of dissociative disorders have in common a lack of immediate access to the personality structure or mental content in one form or another. As neuropsychiatric disorders, they have much to teach us about the way humans adapt to traumatic stress and about information processing in the brain. In this chapter we will discuss how dissociation has evolved as a concept to serve certain functions, with associated neurobiological underpinnings and developmental dimensions.

2.2 The Evolution of a Diagnosis

The dissociative disorders were classified as Psychoneurotic Disorders in DSM-I, which described that anxiety either “directly felt and expressed or unconsciously and automatically controlled by various defense mechanisms”. This was, to a large extent, influenced by the psychoanalytic theory.
DSM-II (1968) classified these disorders as Hysterical Neurosis, with two subtypes, i.e., conversion type and dissociative type. In conversion type, the special senses were described to get affected, causing symptoms such as blindness, deafness, anaesthesia, paraesthesia, ataxia, and dyskinesias. In the dissociative subtype, alteration was described to occur in patient’s state of consciousness or in his identity, to produce symptoms such as amnesia, somnambulism, fugue, and multiple personality.

DSM-III (1980) and its revision DSM-III-R (1987) included it under the diagnostic categories of psychogenic amnesia, psychogenic fugue, multiple personality disorder (MPD), depersonalization disorder, and atypical dissociative disorder. DSM-III-R stated that the essential feature of the dissociative disorders was “a disturbance in the normally integrative functions of identity, memory, or consciousness.” in the absence of brain insult, injury, or disease.

DSM-IV (1994) and DSM IV-TR (2000) included under the dissociative disorders: the categories of dissociative amnesia, dissociative fugue, dissociative identity disorder, depersonalization disorder, and dissociative disorder NOS. Cases resembling DID, but without amnesia, was moved to the new category of “Dissociative Disorder Not Otherwise Specified” (DDNOS).

Major changes in dissociative disorders from DSM IV-TR to DSM-5 include the following: (1) derealization has been included in the name and symptom structure of what previously was called depersonalization disorder and is now called depersonalization/derealization disorder, (2) dissociative fugue is now a specifier of dissociative amnesia rather than a separate diagnosis, and (3) the criteria for dissociative identity disorder have been changed to indicate that symptoms of disruption of identity may be reported, as well as, observed, and those gaps in the recall of events may occur for everyday and not just traumatic events. Also, experiences of pathological possession in some cultures are included in the description of identity disruption.

2.3 Dimensions of Dissociation

Dissociation is a complex process composed of a number of related domains. In addition to the disruptions of memory and identity that are a core feature of dissociative disorders, dissociation involves experiences of intense absorption (Bernstein and Putnam 1986). Measures of absorption such as the Tellegen Absorption Scale (Tellegen and Atkinson 1974) correlate significantly with measures of hypnotizability and with measures of pathological dissociation (Nash et al. 1993).

Dissociation is often discussed from another perspective, that of entry into a specific state of consciousness, the dissociative state. The concept of dissociative state of consciousness was present in the earliest writings of hypnosis and dissociative disorders. Dissociative states were a core feature of Janet’s thinking about dissociative disorders and continue to be routinely invoked in discussions of hypnosis and the dissociative disorders today (Putnam 1991). From this perspective, an individual experiencing dissociation enters into a unique state of
consciousness—the dissociative state that has certain specific features—(a) isolation of memory and affect from normal states of consciousness (b) disturbance in sense of identity or sense of self (c) intense absorption of focused concentration and in the case of hypnotic state and increased suggestibility.

Dissociation is thus conceptualized as a specific state of consciousness with certain properties that individuals enter into with different frequencies and/or for different lengths of time, thereby creating a continuum distribution of the degree of dissociation (Saxe et al. 1993). Those individuals who enter into a dissociative state more often and/or for longer periods, experience significantly more dissociative phenomena. An individuals’ dissociativity can be defined as a function of the frequency and duration with which the individual spontaneously enters into a dissociative state of consciousness in naturally occurring situations (Putnam 1991).

2.3.1 The Defensive Mechanisms of Dissociation

Dissociation is widely regarded as a defensive operation invoked by individuals caught in situations they wish to escape or avoid. From Janet (1920) onward, it has been recognized that dissociation serves to defend an individual against unacceptable psychological or physical experiences. Ludwig (1983) proposed a set of adaptive and defensive functions performed by dissociation including automatization of certain behaviors, efficiency, and economy of effort, escape from the constraints of reality and isolation of catastrophic experiences and cathartic discharge of feelings. Additional defensive operations such as analgesia and detachment from the self have been identified by others (Putnam 1991).

These aforementioned defense functions can be broadly classified into four defensive operations: (a) automatization, (b) compartmentalization, (c) alteration of identity, (d) protection from unbearable pain. These dissociative subprocesses work independently and in combination to produce the psychological and clinical phenomena identified as dissociative behavior. It should be kept in mind that dissociation is commonly present in a variety of minor forms in everyday life and it is in many respects a last effort psychological defense response.

2.3.1.1 Automatization

Many of the examples of “everyday” normal dissociative behaviors involve automatization of complex actions such as driving a car in high-speed traffic. Automatization involves a redirection of conscious awareness away from an activity. Usually attention is withdrawn from a repetitive or procedural activity that can be done by rote. Conscious awareness is frequently redirected from external activities to internal preoccupations. The ability to divide attention, particularly in situations where the individual is facing a boring but potentially demanding task, increases the ability to accomplish necessary mental chores such as planning and problem solving.
Automatization may occur in varying degrees, with a dynamic waxing and waning of conscious awareness of the activity depending on changing circumstances. Automatized activities may range from complex tasks like driving an automobile to minor mental overflow activities like doodling while talking on the telephone. Return of conscious awareness to the automatized task may be rapid and abrupt.

2.3.1.2 Compartmentalization

A second, critical component of defensive dissociation is compartmentalization, the partitioning off of areas of conscious experiences from each other. Defensively, compartmentalization permits the isolation of catastrophic experiences. Overwhelming perceptions, sensations, affects and ideation can be walled off from everyday waking consciousness, allowing the individual to function in other areas of life. The dissociation of traumatic experiences from normal consciousness, however, impedes their psychological resolution so that walled-off trauma remains “raw” and psychologically fresh despite the passage of time. Dissociated traumatic material often seems to have a life of its own, periodically intruding into awareness through dreams and nightmares, flashbacks, intrusive images, affects, and memories. The induction of altered states of consciousness by alcohol, drugs, hypnosis, or other procedures frequently increases the leakage of dissociated material into conscious awareness (Ludwig 1983). In addition to sequestering traumatic material, compartmentalization can act to preserve sensitive psychological functions and capacities by rigidly isolating them from disruptive and intrusive material.

2.3.1.3 Alterations and Estrangements of Self

Dissociative defensive alterations of identity take a variety of forms. In psychogenic amnesia, the individual may “forget” who and what he is in a global and selective way as necessary to protect himself from the effects of a traumatic event. While in a psychogenic fugue, an individual may elaborate another identity, remaining largely amnesic for his original identity and its problems. In multiple personality disorder, the individual switches among a series of alter identities that personify specific functions, capacities or experiences. In depersonalization, the individual experiences a loss of or a distortion in his or her sense of reality of self, often accompanied by feelings of detachment and “numbness”.

Profound alterations of identity in concert with compartmentalization, can effectively, if only transiently, isolate catastrophic psychological experiences. The withdrawal of investment in self that accompanies traumatically induced depersonalization acts to protect the individual from the loss or annihilation of self in the face of death.
The alter personalities of MPD represent complex disturbances of identity and self that contain conflicts, preserve functions, and express forbidden impulses. The partial or complete obliteration of identity in psychogenic amnesia often serves to “stop time” until the individual can safely process the overwhelming event. Dissociative alterations in self and identity transform the denial process from “its not happening” to “its not happening to me”.

2.3.1.4 Protection from Unbearable Pain

Most of the defensive operations of dissociation act to spare the individual from overwhelming psychological and physical pain. Analgesia or even complete anaesthesia for pain is commonly reported during traumatically induced dissociative reactions. Protection from physical pain, together with depersonalization of self, permits some individuals to endure horrible experiences such as rape or torture in a detached manner (Nash et al. 1993).

2.3.2 Neurobiology of Dissociation

2.3.2.1 Neurobiology of Amnesia

Less is known about the neurobiology of amnestic states, as these are often difficult to capture as they are occurring, and their dissociative nature may not be firmly established before they resolve. Nonetheless, fMRI has been used to study laboratory paradigms of memory suppression or repression using nonpsychiatric participants instructed to either think or not think of the second member of a pair of words previously seen (Shmuelof and Zohary 2005). Subsequent cued recall of suppressed words was inferior to recall of baseline words. This suppression response perhaps involved the circuits involving prefrontal cortex, paralimbic, subcortical, and parietal integration areas accompanied by bilateral reduced activation of hippocampal areas (Milner 1959; Shmuelof and Zohary 2005). However, hippocampal activation patterns differed between individuals with ordinary forgetting versus suppression-induced forgetting. Moreover, there is suggestion of involvement of dorsolateral prefrontal cortex, hippocampus, anterior cingulate cortex, medial temporal lobe, dorsal pre-motor cortex, presupplementary motor area, and intraparietal areas which might support a neurobiological model for memory control in response to trauma, and the duration of amnesia.

There are very few neurobiological studies of individuals with dissociative amnesia. In a paper in which glucose-PET data from 14 patients with dissociative amnesia and severe episodic-autobiographical memory deficits were analyzed in combination, it was found that again the right temporo-frontal region was hypometabolic in a significant number of patients, with a significant reduction in the right infero-lateral prefrontal cortex (Brand et al. 2009). This finding has possible
therapeutic implications. It suggests that if the brain regions of the right temporo-frontal cortex, which are interconnected by the uncinate fascicle, were brought to normal metabolic activity via environmental manipulations, the patients’ ability to recollect personal events from the past might be reinstated. A kind of confirmation and extension of these results came in the same year from the work of Tramoni et al. (2009), who in a patient with dissociative (“functional”) amnesia performed magnetization transfer ratio measurement and MR spectroscopic imaging—methods sensitive to microstructural and metabolic brain changes. They found evidence of significant metabolic changes and subtle structural alterations of the white matter in the right prefrontal region. A recent review of these studies (Staniloiu et al. 2012) suggested that disruptions or functional disconnections between major neural networks might be etiological in dissociative amnesia syndromes.

2.3.2.2 Neurobiology of Depersonalization

Depersonalization disorder involves a dissociation of perceptions (feeling detached from own body or mental activity, like in a dreaming state or like an outside observer), in the absence of significant impairment of reality testing. It is characterized by an alteration of the subjective experience of self.

While several imaging studies of depersonalization focused on targeting the neural correlates of depersonalization as a symptom of other disorder (Lanius et al. 2005) or a symptom that was induced via various environmental manipulations (Stone et al. 2006; Blanke and Metzinger 2009) only a few studies looked at the neural correlates of depersonalization disorders. Simeon et al. (2000) investigated 8 subjects with depersonalization disorder and 24 healthy matched controls with both structural (MRI) and functional imaging (FDG-PET). During the PET scanning the subjects were given a variant of California Verbal Learning Test modified for use in imaging study. The depersonalization disorder group showed significantly lower metabolic rates in areas belonging to the right superior temporal gyrus and middle temporal gyrus. In addition, they showed higher metabolic rates in parietal lobe in comparison to normal probands. In occipital lobes, left Brodmann area 19 was significantly more active in the depersonalization group. The authors concluded that depersonalization disorder is associated with functional abnormalities in sensory cortex (visual, auditory and somatosensory) as well as areas that are important for body schema (such as parietal cortex).

2.3.2.3 Imaging the Symptom of Dissociation

Various dissociative symptoms can accompany a number of psychiatric diagnostic entities (other than dissociative or conversion disorders) and have been targeted by several functional imaging studies (Kraus et al. 2009; Ludascher et al. 2010). For example dissociative amnesia can occur as a symptom in certain anxiety disorders, such as acute stress disorder and posttraumatic stress disorder (PTSD) or
in the DSM-5 described somatization disorder or in borderline personality disorder (Horowitz 1979; Zanarini et al. 2008). PTSD conditions which are accompanied by “positive” dissociative symptoms such as flashbacks and intrusions seem to engage different neural networks than PTSD conditions that are accompanied by “negative” dissociative symptoms such as amnesia (Oakley 1999). Lanius (2005) found that in general a network of prefronto-temporoparietal are as was engaged in all patients, but that the group with “positive” symptoms had compared to normal subjects—in addition a greater covariation with the right insula and right visual association cortex (compared to the reference in the left ventrolateral thalamus). Between the two groups, that with “negative” symptoms of dissociation showed—compared to the “positive” (flashbacks) group—a more significant covariation in the left inferior frontal gyrus, while vice versa the “positive” symptoms group had more significant covariations with posterior cingulate/precuneus regions, the right middle temporal and the left inferior frontal gyri. In a recent review arguments were made for a mechanism of under modulation of emotion via failure of prefrontal inhibition of limbic regions (such as amygdala) underlying the reexperiencing/hyperarousal PTSD subtype and one of over modulation of the emotional limbic reactions in the (“negative”) dissociative PTSD subtype (Lanius et al. 2010).

2.4 The Developmental Basis of Dissociative Disorders

2.4.1 Normative Dissociation in Children

Very little is known about the developmental basis of dissociation and the dissociative disorders. Potentially relevant domains of knowledge include (a) research on the developmental basis of hypnotizability (b) studies of behavioral states in infants (c) the array of diverse theoretical perspectives and empirical data on the nature and development of imagination and fantasy in children (d) research on attachment and attunement, particularly as it relates to dissociative behavior between the mother and child and, (e) studies of the development and integration of self.

Most authorities believe that children are normatively more dissociative than adults (Kluft and Loewenstein 2007; Putnam 1991). This is based more on clinical experience than on empirical data (Deka et al. 2007). Experimental knowledge about one form of normal dissociation comes from the studies of hypnotizability, a modern correlate of clinical dissociation in adults and only a presumed correlate of clinical dissociation in children. A second and source of data comes from research with the Child Dissociative Checklist (Putnam et al. 1993). In sum, these data lend support to the clinical conceptualization that children are more dissociative than adults. They also indicate that dissociative capacity declines over the course of childhood and adolescence. Beyond these general impressions, however, virtually nothing is known for certain about the developmental trajectory of normative dissociation.
Data on hypnotizability in children show a curvilinear relationship with age, initially rising to a peak at about 9–10 years of age and then declining during adolescence (Putnam 1991). Cross-sectional studies of adults reveal that hypnotizability continues to decline over the life cycle, though the slope becomes more gradual by the third decade (Jans et al. 2008).

2.4.2 Imagination and Fantasy

One of the most important areas in the development of dissociative disorders comes through the study of imagination and fantasy. Much has been learned about the range and course of imagination and fantasy capacities over development. Role playing, fantasy, and other aspects of make-believe have received periodic attention by developmental psychologists (Bretherton 1989). These activities have been studied primarily in play or storytelling contexts with samples of normal children, typically preschoolers. Investigation of pretend play reveals a great deal of complexity and richness in young children. Of particular relevance to the dissociative disorders is the identity shifts that children manifest during pretend play. In addition to being “actors” in their make-believe play, children are also “playwrights” and “stage directors”. Children switch back and forth among these roles so seamlessly and it is only rarely that they become confused about which role they or their partner are in at a given moment. A better understanding of role playing and role exchanging capacities in normal and traumatized children may shed light on dissociative disturbances in the modulation of identity transformation.

A second area of developmental research has focused on the ability of children to distinguish between reality and fantasy. With age, children develop an increasing ability to distinguish between these domains. Even three year olds can reliably differentiate between real and mental representations of same objects (Harris 1991). It has been postulated that children develop the concept of a boundary between fantasy and reality realms that becomes more sophisticated with time. Children appear to have more difficulty making this differentiation in the area of fantasies about monsters, ghosts, and other scary beings. The studies of children’s wary reactions to a box that contain an imagined monster which convincingly demonstrates that even six-year olds can become frightened by their own fantasy creation.

An extension of Harris (1991) hypothesis is that perhaps monsters, ghosts, and scary creatures represent a special class of mental objects that differ from mental representations of common physical objects (cup, toothbrushes, etc.) used in other studies of reality testing. It may be imagined that “living” entities, be they good or evil, are more real for children (and adults) than are imagined physical objects.

A third related area of research concerns the nature of imaginary companion-ship. Most developmental studies use definition of an imaginary companion as
“an invisible character, named and referred to in conversation with other persons or played with directly for a period of time, having an air of reality for the child but no apparent objective basis”. Imaginary companionship is relatively common normative phenomena, beginning about the age of four. Parents are often unaware of the existence of number of imaginary companions their child have. A variety of purposes have been proposed for imaginary companions. Psychoanalytic writings concentrate on association with stress, loneliness, or discharge of forbidden impulses, the developmental literature emphasizes on socialization. Firstborn and only children are more likely to have imaginary companions, and children with imaginary companions are more adept at talking and interacting with adults and score higher on measures of socialization (Manosevitz 1973).

Imaginary companionship has been identified as a possible developmental substrate for the creation of alter personalities in MPD patients (Hilgard 1977; Lynn 1988). Many adult MPD patients report that their alter personalities first existed as externalized imaginary companions created for companionship during times of loneliness or physical confinement. Congruent with adult reports, the alter personality in children with MPD are sometimes externalized by the children as vivid imaginary companionship rather than internalized alter personalities (Putnam 1991). Clinical evidence suggests that these externalized alter personalities are later internalized around puberty.

The developmental literature views imagination and fantasy capacities as normative and more likely to be associated with socialization and creativity, whereas, the psychoanalytic literature regards these processes as serving defensive purposes. Among the defensive functions ascribed to fantasy are escape, wish fulfillment, restitution of self-esteem and revenge. It seems reasonable that if adults retreat into imaginary worlds during times of isolation and maltreatment, that traumatized children, with their developmentally heightened imaginary capacities, must also make use of this escape route (Feinstein 2011).

One branch of research on hypnosis has concentrated on the identification and study of “fantasy-prone individuals”. Fantasy prone individuals denote a group of persons who “live much of their time in a world of their own making- a world of imagery, imagination and fantasy”. It is estimated that about 4 % of the population are fantasy prone. These individuals tend to hallucinate vividly, experience fantasy as reality, and to have difficulty in differentiating fantasy events from real experiences. Fantasy prone individuals report a variety of identity alteration processes including, believing that they become someone else while in fantasy and having out of body experiences. Fantasy prone individuals are also highly hypnotizable. Of particular interest is the observation that fantasy prone individuals generally share a childhood background of abuse, neglect, and hardship (James 1984; Lynn 1988). In addition to being highly hypnotizable, fantasy prone individuals are also highly dissociative.

In summary, several lines of evidence connect dissociation with imagination and fantasy capacities.
2.4.3 Dissociation and Attachment Theory

The concept of attachment has proven to be a powerful construct driving much research in the field of developmental psychology and developmental psychopathology. The impact of maltreatment on attachment behavior in children has been investigated. Histories of insecure attachment are significantly related to self-destructive behaviors in adults abused or neglected as children (Van der Kolk 1991). High levels of dissociation were predictive of self-mutilation and suicide attempts in the above study sample. Significant levels of dissociation, on the part of the child and/or caretakers, are likely to influence the display of attachment behaviors in certain contexts and to influence the quality of attachment relationship.

Although no formal studies of attachment behavior exist for dissociative patients, clinicians have invoked attachment theory in explanations of MPD. Barach (1991) equates the detachment phase of separation response described by Bowlby with dissociation in that the abandoned child is sequestering information and behavior related to attachment stimuli. It has been viewed the detachment response as a “deactivation of the attachment behavioral system that excluded from awareness signals, arising from both inside and outside the person, that would activate their attachment behavior and that would enable them both to love and to experience being loved”. The dissociative memory disturbances could serve as a mechanism for screening out attachment cues or for decoupling attachment behavior from attachment stimuli. Clinically, detachment from self and surroundings, usually manifest in depersonalization and derealization, a common feature of dissociative disorder and evoked by overwhelming trauma.

At present, the strongest line of evidence supporting the argument that MPD involves significant disturbances in attachment comes from interpretations of the typical transferential responses of MPD patients in psychotherapy. Early in treatment, MPD patients characteristically “test” their therapists with frequent emergencies, demands for extra sessions and requests for special treatment. At the same time they usually make threats and attempts to leave treatment citing the therapist’s failure to meet their needs as justification. Barach (1991) interprets these behaviors as evidence for the activation/deactivation of attachment behaviors. One of the core principles of treatment for MPD is that the therapist provides a constancy of demeanor and behavior in counterresponse to the perturbations in the therapeutic relationship resulting from alters personalities’ differential transference responses (Lyons-Ruth et al. 2006).

One potential area of investigation is the effects of dissociation on the integration of the internal representational models that are postulated to underlie the meaning and organization of attachment responses. A pathologically dissociating child could be expected to have several different working models of an attachment relationship with his/her abuser—each associated with a specific set of dissociatively compartmentalized memories. The dissociative barriers would act to impede
the integration of different attachment representations. Consequently, the child would show very different attachment behaviors depending on which set of memories and representational model is currently being activated (Spitzer et al. 2006).

In MPD, clinicians often find within the same individual alter personalities that hate the abusing parent, alter personalities that idealize the same parent, and alter personalities that disclaim any relationship, positive or negative, with the parent. The ability of abused children to maintain strong attachments to their abusers may reflect some form of dissociation of their internal representational models.

2.5 Conclusions

After reading the chapter it is evident dissociative disorders constitute a complex manifestation of mental processes of which emotional trauma seems to play a primary role. They have been understood both in terms of psychoanalytic principles and have also been shown to have neurobiological underpinnings. The set of adaptive and defensive functions performed by dissociation include automatization of certain behaviors, efficiency and economy of effort, escape from the constraints of reality and isolation of catastrophic experiences, and cathartic discharge of feelings. It has shown to be related to attachment theory, and has a strong developmental basis in children. Hence, to be able to understand the phenomena, one has to evaluate in detail the history since early childhood and environmental modulators; and the significant interaction between them.

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Child and Adolescent Psychiatry
Asian Perspectives
Malhotra, S.; Santosh, P. (Eds.)
2016, XXIX, 488 p. 10 illus., Hardcover
ISBN: 978-81-322-3617-7