

## Chapter 2

# Mind in Conflict and Unity

According to Freud's (1895) psychodynamic concept, the 'free' energy of mind is related to certain unconditioned drives that tend to create certain kinds of thinking, feelings and behavioral patterns that are experienced as 'mental images' and 'internal goals'. The 'free' energy is projected to the outside world through wishes and imagination linked to the process of 'projection' or 'transference' that temporarily identifies—unconscious and implicit—"internal" intentional energy with real events and processes in the external world. The terms of projection or transference are specifically linked to a direction or redirection of feelings and desires to targets in the external world that exist as representations of the internal space of potentialities—goals, wishes and intentions—that have energy that can be bound into these intentions and create mental representational maps.

In close similarity to thermodynamics where free energy can be bound, the process of projection or transference enables that the free psychic energy is 'bound' to a target and transformed into mental and behavioral activities. These include momentarily activities and future plans that create space of meanings in the space and time. In the case that energy is bound to two "mental" objects related to events and objects in the outside worlds experienced as conflicting then it may lead to dissociative state in which mind is splitted into contradictory tendencies. The event related to intrapsychic conflict leads to increased psychological tension, stress and mental disorganization, in which an amount of energy cannot be bound. In this context, the dissociative states are related to mental events that bind free energy into two or more conflicting mental states and behavioral patterns.

Recent ethological and other scientific findings indicate that the human mind contains specific innate patterns of behavior spontaneously generating 'free energy' that tends to be focused and 'bound' to significant and specific mental images, identity, self-representation and neurobehavioral patterns. Based on these innate structural preferences of 'mental association patterns', similarly as in chemical thermodynamics where atoms create preferred forms (or patterns) of 'molecular structures' with lowest levels of energy, also mental structures likely may be created on thermodynamic principles. In this context, by similar way as we study structural

determination of various forms in scientific disciplines like physics or chemistry, likely using basic principles of thermodynamics may be possible to find the basic structural processes for description of mental processing.

Based on these general thermodynamic principles there is likely a similar tendency to create dynamic patterns of the mind with lowest possible level of free energy reflecting feelings of ‘satisfaction’ and balance that likely also define preferred patterns of the brain states. In this context, it is possible to assume that mental integration and unity existing as a mental potentiality related to ‘hope’ and ‘meaning’, could represent ‘balanced’ state of the mind that focuses its free energy to the external world without a conflict, which as Freud suggested in principle might be linked to ‘neural unity’.

## 2.1 Conflict and Energy of the Mind

According to Freud’s psychodynamic concept the ‘free’ energy of mind is related to certain unconditioned —innate or instinctual—drives that tend to create certain kinds of thinking, feelings and behavioral patterns that are experienced as ‘mental images’ corresponding and representing ‘internal goals’ and the ‘free’ energy creates its representation in the outside world through patterns of behavior that temporarily identify the internal energy with real events and processes in the external world.

In this context, recent ethological and other scientific findings indicate that the human mind contains specific innate patterns of behavior spontaneously generating ‘free energy’ that tends to be focused and ‘bound’ to significant and specific mental images and “objects” based on innate “fixed action patterns” representing underlying predispositions to learn with relatively stereotyped behavioral elements that are very similar in various populations of animals and humans, similarly as anatomical and physiological properties (Lorenz 1950). These innate patterns of behaviour are related to specific neural activities in multiple specialized memory systems that define recognition patterns (Freeman 1991, 2000, 2001; Fell et al. 2003; Womelsdorf and Fries 2006, 2007; Jensen et al. 2007; Sauseng and Klimesch 2008; Fries 2009). These specifically different patterns of neural activity enable to distinguish among various outside stimuli and create specific memories for various specific behavioral patterns and are modified through conditioned stimuli and learning (Sherry and Schacter 1987; Goldsmith 1991; Sherry et al. 1992; Cosmides and Tooby 1995; Shettleworth 2000, 2009). Current research in comparative psychology also shows that this innate ability of recognize is not linked to just simple patterns of recognition but include also highly abstract forms like numerical cognition (Brannon 2006; Shettleworth 2009). These data provide evidence that human infants and nonhuman primates have innate sophisticated systems representing numbers as language-independent mental recognition of visually presented mathematical objects (Pepperberg 1994; Hauser et al. 1996; Brannon 2006; Shettleworth 2009) that have an ontoge-

netic origin and a neural basis independent of language (Gallistel and Gelman 1992; Gelman and Butterworth 2005).

Connection of these highly evolutionary developed innate internal patterns with objects in the external world is based on hierarchical scales of less or more general specific qualities and signs contained in processed sensory information that enables recognition. During recognition and selective attention processing, dynamical interactions enable to compare sensory information with information encoded in memory and distinguish differences using neural “recognition patterns”. These mental structures enable to distinguish and create relationship between mental intention related to the recognition pattern and its form in the external world. This process likely is based on repeated comparisons of various competitive neural patterns representing possible interpretations of the received information during selective attentional processing (Desimone and Duncan 1995; Baars 1988, 2002; Kanwisher 2001). Selected interpretation from this competition and its neural pattern represent the output of the recognition process, which is subjectively experienced as mental representation of the interpretation.

With respect to the current evidence about attentional processing it is likely that these complex dynamical interconnections forming various neural patterns and also comparisons among them produce “differences” which define basic “codes” for recognition. These differences are likely encoded through specific dependencies or independencies among the neural patterns which define hierarchical scales of identities and differences that are interpreted in the “theatre” of mind as different mutually dependent or independent objects. The brain mechanisms that enable multilevel information processing are regulated within the framework of contextual understanding which strictly determines what details are important for the whole coherent context. This hierarchical processing may provide feedback to lower levels and may initiate reprocessing of any information that enable its reintegration in contexts of various schemes and concepts (Mesulam 1998; Nadel and Jacobs 1998; Lavenex and Amaral 2000). For example, in processes of visual cognition this hierarchical contextual structures have been found in frontal and temporal regions that provide inhibitory feedback to the initial processing in primary visual areas V1 and V2 (Hupe et al. 1998; Bullier 2006; Fabricius 2010).

These findings suggest that the multilevel information processing of perceptual information might be related to executive signals that in the framework of required context determine sensitivity to various details needed for contextual processing and significantly influence processing through various feedback interactions (Gilbert and Wiesel 1990; Francis et al. 1994; Gove et al. 1995; Gray 1999; Grossberg and Grunewald 1997; Ito and Gilbert 1999; Raizada and Grossberg 2001; Kang et al. 2005).

In this sense contextual processing may determine what details of the processed information will actually be presented in conscious awareness and there is evidence that transient synchronized oscillations dynamically linking neurons into assemblies through the process of “binding” mainly at gamma frequencies (30–100 Hz) are closely associated with sensory processing, attentional selection, effective sensory-motor integration and also play an important role in working and long-term

memory (Fell et al. 2003; Womelsdorf and Fries 2006, 2007; Jensen et al. 2007; Sauseng and Klimesch 2008; Fries 2009).

The recognition process within various contextual frameworks is determined by hierarchically defined differences that are basically dependent on signal spread to sensory cortices and other structures participating in signal processing that enable to create “neural information patterns”. In this context Shanon’s principle of communication implicates that any event of information propagation and its processing leads to the information loss and produces the information entropy, which defines “uncertainty” of the signal for its receiver. This uncertainty in information processing specifically influences recognition process and increases probability of the recognition error. The information loss produces “uncertainty” or “ambiguity” and negatively influences possibility to recognize. For example, the loss of information during propagation may cause difficulties to distinguish between two similar persons during getting dark and may lead to perceptual ambiguity.

But on the other hand the same effect of uncertainty may be caused by two well perceived conflicting stimuli as for example during the Stroop color-word interference task (is this color “**white**”?) and other experiments related to processing of incongruent and conflicting information (Kanwisher 2001). This relationship between the information loss and possibility to recognize implicates that the main feature of recognition is clear definition of the recognition pattern which clearly defines the difference between the objects. The “difference” may be significantly decreased or lost due to signal propagation or during perceptual processing leading to conflict.

Recent research of the neural correlates of perceptual consciousness provides extensive evidence from behavioral studies that perceptual information can be represented in the mind/brain also without the subject’s awareness of that information (Crick and Koch 1995; Kanwisher 2001). These findings suggest that perceptual information may be processed and included in various contextual frameworks and that awareness requires access to that information by other parts of the mind/brain (Baars 1988, 2002). The limits on conscious access to perceptual information may not be immutable and conflicting streams of information as well as pathological brain changes may disrupt neural pathways and as a consequence perceptual information represented in one “contextual” neural pattern is not accessed by other parts of the system (Baars 2002; Kanwisher 2001). Experimental conditions that enable to assess modulatory influences on discriminative processes, attentional filtering and contextual processing have been studied also using various methods of hypnotic suggestion and several data indicate that the threshold of consciousness may change during hypnosis. For example, Stross and Shevrin (1962, 1968, 1969) have found alterations of thought contents under hypnosis in investigation of “freely evoked images” after the subliminal presentation. These and other findings suggest that hypnosis leads to heightened access to subliminal stimuli and that thought organization during hypnosis shares some common elements with thought organization during dreaming (Bob 2004). This finding corresponds to similar reported data when subliminally presented images were found in dreams (Fisher 1954; Pötzl 1960). In this context, seems to be likely that various sensory stimuli that has an importance for cognitive processes and adaptive behavioral responses may be

influenced by various mechanisms of cognitive modulation and that subliminality may present a relative phenomenon characterized by a sensitivity of discriminative responses (Wortman et al. 1992; Erdelyi 2004a, b; Reingold 2004; Kihlstrom 2004).

According to this evidence even a “strong” and “meaningful” neural representation may not be sufficient for awareness and there is behavioral evidence that perceptual awareness involves not only activation of the relevant perceptual properties but also further construction of an organized representation in which these sensory properties are attributed to their sources in external objects and events (Kanwisher 2001; Baars 1988).

On the other hand there is also evidence that only simple focusing of visual attention on different aspects of an unchanging stimulus has a strong effect on the content and intensity of perceptual awareness (Rees et al. 1999). In this context, numerous studies using single-unit recordings, ERPs and brain imaging have shown modulations of sensory responses by attention, even for a constant stimulus (Desimone and Duncan 1995; Luck and Girelli 1998; Goebel et al. 1998; Kanwisher 2001).

Simple examples of these cases provide ambiguous stimuli leading to alterations of perceptual experience between two different states (Fig. 2.1) such as Necker cube, Rubin’s face/vase, moving circle or experiments with binocular rivalry in which different images are projected to each eye (Kanwisher 2001; von Helmholtz 1962). Although the stimulus itself does not change the human observer sees only one of the possible percepts, instead of seeing a mixture of the two possible images. For example, typical experiment with binocular rivalry includes presentation of vertical stripes that are presented to the left eye and horizontal stripes to the right eye. The viewer is likely to see not a superimposition of the two patterns (i.e. a crosshatching plaid pattern), but an alternating sequence in which only vertical stripes will be seen for one moment, and only horizontal stripes the next. Based on research of the binocular rivalry and other competitive phenomena there is evidence that subjective experience alternates in a bistable fashion between being dominated by the one or the second image that results from the interpretation process (Blake et al. 1998; Kanwisher 2001).

Theoretical explanation of the observed phenomena proposed Desimone and Duncan (1995) in the concept of ‘interactive competition’. According to this model, competitive interactions across cortical areas result in domination of perceptual representations by properties of a single object. This competition can be biased by either bottom-up factors (e.g. stimulus salience) or top-down factors (e.g. endog-



**Fig. 2.1** Examples of bisable figures, Necker cube, Rubin’s face/vase, moving circle

enous attention). In either case the result is that the various properties of an object represented in distinct cortical regions enhance each other and suppress the representation of competing objects with periods of dominance with mutual exclusivity (Rubin 2003), which results in multi-stability when the two (or more) percepts alternate in a seemingly random manner that likely has nonlinear dynamic features (Aks and Sprott 2003). In this context, attentional processing and awareness are global properties of the entire perceptual system that are linked to specific forms of contextual connections in multiple cortical areas and these processes likely present a basic mechanisms for perceptual consciousness as well as for dissociative phenomena.

In this context, dissociation presents a mental event in which some contextual element is conflicting and although it is a part of the mental scheme at the same time it does not fit into this contextual framework. The processes of contextual interactive competition suggest that neural entropy and complexity that enables to describe levels of interactions related to order and disorder among neural assemblies involved in cognitive processing in principle could reflect typical attentional changes related to divergent conflicting components in dissociative states (Li and Spiegel 1992; Bob 2003; Bob and Svetlak 2011; Bob et al. 2011). In this sense, the dissociative states are related to mental events that bind free energy into two or more conflicting mental states and behavioral patterns that lead to increased psychological tension and stress.

## 2.2 Conflicting Information and Dissociated Mind

In agreement with the thermodynamic concept of mind proposed by Freud in his “Project”, dissociation or splitting of the mind is typically related to mental divergent components that determine mental and neural disunity. The conflict disables to use the intentional energy which based on thermodynamical principles means that energy that cannot be used for intentional movement and behavior increases entropy that manifests as increased disorder in the system. In this context, typical consequence of a conflict in which an amount of intentional energy cannot be bound to intentional behavior causes dissociation as a defensive response leading to mental disorganization that enables reduction of psychological tension. Dissociation is typically related to long-term or acute stress that significantly disturbs self-concept, identity, memory and perception of the external world. On the level of personal experience dissociation is related to mental fragmentation or splitting due to the conflict and confusion that disturbs meaningful intentional behavior. Consequently these alterations may be linked to great and abrupt changes in patterns of neural activity that may cause dissociation of certain external and internal stimuli out of awareness, and the lack of the self-representation which may lead to a distinct state of dissociated or divided consciousness (Crawford 1994; Rainville et al. 1997, 2002; Villemure and Bushnell 2009; Bob 2007, 2008a; Vermetten and Douglas 2004). These dissociated self-representations have sensory, emotional and cognitive elements that may be misinterpreted and experienced as external reality for example

during projection or transference when inner psychic states are interpreted as external parts of other persons or during hallucinations, when certain internally generated voices or images are interpreted as sensory signals from the external world (Feinberg 1978; Feinberg and Guazzelli 1999; Ford et al. 2001; Tsakiris et al. 2005).

Cognitive and affective representations of one's identity or the subject of experience present a basis for self-recognition as a specific cognitive process typically involving conscious experience and interpretation activity. Disruptions of these self-interpretation processes likely represent a neurophysiological substrate for the process of fragmentation of consciousness because of misattribution of certain inner states that may be interpreted as external objects because they are "disowned" and dissociated from consciousness. Psychological or physical stimuli leading to hopelessness and conflicting situation without known solution that do not fit into current cognitive scheme may lead to dissociation and "depersonalization" of certain perceptions, emotions and cognitive strategies that create discrete "ego-states" [or "alter-personalities" in dissociative identity disorder] which are divided from predominant state of consciousness (Bob 2008). All these processes of disrupted awareness and conscious integrity likely are related and represented by similar disruptions on the brain level, and dissociation, in principle, may be explained by various levels of disturbed binding and brain coherence that may negatively affect usual patterns of connectivity, complexity and synchronous activity constituting adaptive integrative functions of consciousness (Bob 2011).

History of research about dissociated mind started Hughlings Jackson (Ellenberger 1970). Jackson studied the so called "dreamy states" frequently related to temporal lobe seizures. His descriptions of the dreamy states first appeared in 1870s and included their typical symptoms such as hallucinations, strangeness, unreality of things such as derealization or depersonalization, double consciousness (looking at one's self through the eyes of others), *déjà vu* and *jamais vu*, various autobiographical memories including flashbacks and other symptoms currently described in medial temporal lobe epilepsy (Jackson 1931; Meares 1999; Hogan and Kaibori-boon 2003, 2004).

In his writings Jackson reported numerous cases of the dreamy states and described close association of the dreamy states with immediate onset of the epileptic discharges (Jackson 1931). Recently, similar cases reported Vignal et al. (2007), who studied spontaneous and provoked dreamy states using electrical discharges localized within mesial temporal lobe structures and found that early spread of the discharges to the temporal neocortex prevented the occurrence of the dreamy state. In agreement with further evidence emphasizing the central role of the amygdala and hippocampus (both left and right) in the recall of recent and distant memories they also found, that the pathological activation of the amygdala and hippocampus during seizures may trigger memory recall. Also Penfield found that visual hallucinations were elicited by electrical stimulation in sites widely distributed over the temporal neocortex (Penfield 1967; Penfield and Perot 1963). Penfield reported that these experiential hallucinations replying past experiences reflected a bi-directional activation of temporal neocortex involved in memory storage and also centrencephalic system participating in integration of memories. Further research has shown



that the dreamy states may be elicited by stimulation of the medial temporal lobe structures (Ferguson et al. 1969; Halgren et al. 1978; Gloor et al. 1982; Gloor 1990; Bancaud et al. 1994).

Jackson also proposed interpretation of the dreamy states as a release of lower level of brain functions because of inactivated inhibition of highest functional levels caused by the epileptic discharges and not as a direct consequence of epileptic discharges. For theoretical explanation of his clinical data Jackson used the principle of “dissolution” that causes automatic processes with less voluntary control and less complex mental structure than occurs in a normal state mind because there is a loss of later developed higher nervous functions leading to a dysregulation and exaggeration of more primitive functions (Ellenberger 1970; Meares 1999). This interpretation of the dreamy states is in agreement with findings that functional de-activation of the amygdala and hippocampus by epileptiform activity leads to liberation of neocortical structures (Halgren et al. 1978; Bancaud et al. 1994).

Following these Jackson’s findings Théodule Ribot in his works on diseases of memory introduced an important concept of retrograde amnesia that was later formulated as “Ribot’s Law”. This states that brain damage has greater influence on recent than on remote memories, i.e. that more recent memories disappear before the earlier ones. The Ribot’s Law opened new era in the study of disorders of memory such as amnesia, multiple personality disorder, hysteria and other dissociative phenomena (Ellenberger 1970). He adopted the principle of evolution and dissolution proposed by Jackson (Ellenberger 1970) and applied this principle to the psychopathology of memory and will, which means that similarly like memory also voluntary activities disappear before the earlier ones. This principle is source for the later formulated theory of psychasthenia by Pierre Janet which preceded the formulation of the theory of dissociation (Ellenberger 1970; Meares 1999).

Ribot’s findings developed his follower Pierre Janet, who proposed the concept of dissociation as a specific defensive response leading to memory loss (Ellenberger 1970). Pierre Janet, in his work about psychological automatisms, defined the process of loosening associations using word ‘*désagrégation*’ that was later synonymously used with the term “dissociation” and became known mainly through the works of William James and Morton Prince (Ellenberger 1970). According to this Janet’s description, dissociation means deficit of the associated system that creates the secondary consciousness (Janet 1890; Ellenberger 1970; van der Hart and Friedman 1989; van der Kolk and van der Hart 1989). Following hypnotic experiments with his teacher Charcot, Janet found that people under hypnosis experienced exceptional states of divided consciousness which in some cases manifested as “different personalities” (Janet 1890; Ellenberger 1970). Several later studies reported similar data as Janet described. For example, Bowers and Brecher (1955) reported interesting material involved in the emergence of multiple personality structure under hypnosis. The authors conclude that this structure was not produced by the hypnosis, but preceded the beginning of the hypnotic work. The patient in the case under discussion had not shown the multiple structure in clinical and psychological examinations prior to the hypnosis. In his conscious state the patient was not aware of his three underlying personalities, each of which reported distinctive dream material and Rorschach responses.



Taken together these data suggest that binding between conscious contents and self-function observed in these cases constitutes the self-representational dimension of consciousness which is characterized by interpretation of certain inner states of own body as mental and somatic identity, while other bodily signals are interpreted as perceptions of the external world. Self-representations that are currently not accessible to the dominant interpreter's access are dissociated and may be defined as subliminal self-representations (Bob 2008).

This line of investigation later appeared also in works of Sigmund Freud and Joseph Breuer who considered secondary consciousness in "Studies in hysteria" (Breuer and Freud 1895). In this study, Breuer and Freud developed concept of splitting as a form of dynamical dissociation that leads to shifts of mind during the time due to a conflict of opposing mental forces (Ellenberger 1970; Breuer and Freud 1895). Based on these principles they conceptualized pathological conditions observed in conversion phenomena as a consequence of repression and according to them "dissociated states" are elicited by the repression of the libido energy. In this context, they also proposed new conceptual framework for understanding of the mind-body problem in which mental and somatic factors are closely connected and understood as different aspects of a unity (Ellenberger 1970; Breuer and Freud 1895; Briquet 1859; Mace 1992; Rofe 2008).

The term repression is historically linked to the term abreaction (van der Hart and Brown 1992) defined as an emotional release or discharge after recalling a traumatic experience that has been repressed because it was consciously intolerable (American Psychiatric Association 1980). Breuer and Freud in their "Studies of Hysteria" proposed the concept of abreaction as an emotional discharge related to release of repressed traumatic memories into conscious awareness (Breuer and Freud 1895; Ellenberger 1970). Later data show that psychotherapeutic work that enables integration of the released traumatic experience into predominant cognitive scheme and contextual framework may have positive effects (Brown and Fromm 1986; Horowitz 1986; Ross 1989; Van Der Hart and Brown 1992; Putnam 1992; Braun 1986).

In the same context, Janet elaborated the concept of dissociated mind in his work *Psychological Automatism* and other works (Havens 1966; Janet 1886, 1890; van der Hart and Friedman 1989). He dealt with psychological phenomena often observable in hysteria, hypnosis and states of suggestion or possession and found that during complete psychological automatism related to psychological regression consciousness is totally dominated by repeating past experiences, such as in somnambulism or hysterical crises (Janet 1890; Ellenberger 1970; van der Hart and Friedman 1989). Janet also described partial automatism in which only a part of consciousness is dominated and proposed that in these states play an important role unconscious mechanisms related to traumatic experiences that repress conscious control and perception and called them subconscious fixed ideas (Janet 1890; Ellenberger 1970). In the recent literature the fixed idea is defined as a formation of new spheres of consciousness around memories of intensely arousing experiences with a high emotional charge, which organize cognitive, affective and visceral elements of the traumatic experience while simultaneously keeping them out of conscious

awareness (van der Hart and Friedman 1989). The fixed ideas may emerge in many forms of psychopathological or somatoform symptoms, which may be understood as a representation of psychological trauma when a fixed idea is transformed into hallucinations and dissociative episodes, for example during paroxysms or hysterical attacks (van der Hart and Friedman 1989). Fixed ideas may be also represented in the form of dreams or during hypnosis as a secondary consciousness. Several later studies reported similar data as Janet described. For example, Salley (1988), who studied his patient Frank with multiple personality and found that his alter personalities emerged on parallel levels on the one hand in dreams and on the other in hypnosis. Frank's multiple organization began at the age of 6 years when he lived with his remained mother who had an alcoholic man, who abused Frank physically and emotionally. In his anamnesis was a wide spectrum of dissociative symptoms such as a history of blackouts, amnesia for certain experiences, fugues, abrupt personality changes and hysterical conversions. Frank had a long history of frequent seizures with amnesia. The memory typically returned within a few days after the seizure. During hypnotherapy suggestive methods aimed to uncover lost memory were used. During hypnotic trance appeared Frank's subpersonality who identified himself as Self, a protector of Frank. Self in somnambulistic trance, explained that the seizures resulted from a struggle between Frank and Self. Self stated that his only line of communication with Frank was through dreams and that he would create a dream that would explain to Frank the functions of the seizures. Out of trance, Frank as was typical, had no memory of what had occurred in hypnosis. That night Frank dreamt that he was standing on a pedestal and two voices were shouting at him: one voice shouting "Yes!" and the other "No!" The vibrations from the shouting were so intense that the pedestal began to shake and split open, whereupon he fell to the ground shaking. Free association to the elements of the dream led Frank to relate the shaking to his seizures and the screaming to internal conflict. In the 2 years since he had this dream, he has experienced no recurrence of the dissociative seizures which suggest that the dream reflected communication between dissociated and conflicting parts of his mind (Salley 1988). The Salley's case study and other documented dream works with patients suffering from multiple personality disorder and other traumatized patients present important data for research of parallel levels between dream and hypnotic states suggesting that individual alter personalities may create dreams that provide therapeutically meaningful information, enable communication among dissociated parts of the personality and provide access to underlying personality structure (Ferenczi 1934; Levitan 1980; Putnam 1989; Jeans 1976; Marmer 1980a, b; Hartmann 1998; Guralnik et al. 1999; Bob 2004).

A characteristic feature of these mental conflicts and extreme stress is also a lowering of the mental level (*abaissement du niveau mental*), which is manifested by increased dissociation and mental depression connected to the reduction of psychological tension. Mainly these changes linked to conflicting streams of information specifically influence integrative functions of consciousness and during transient periods related to actual experience of aversive events lead to a greater allocation of attention which leads to discontinuous attentional shifts (Guralnik et al. 2000; Vermetten and Bremner 2004; Bob 2008) in clinical forms of dissociation or during hypnosis (Faymonville et al. 2006; Cojan et al. 2009).

<http://www.springer.com/978-1-4939-2699-2>

The Brain and Conscious Unity

Freud's Omega

Bob, P.

2015, IX, 133 p. 13 illus., 1 illus. in color., Hardcover

ISBN: 978-1-4939-2699-2