Adaptive functioning depends on integration of subsymbolic with symbolic functions within emotion schemas, as defined by multiple code theory. Psychological disorders result from dissociations within and between emotion schemas; dissociation is implicated in varying ways in all emotional disorders. Therapeutic work, as seen in P. M. Bromberg's (2003) clinical material, requires activation of subsymbolic bodily and sensory experience in the session; associated with ongoing events in the therapeutic relationship; triggering memories of the past. Reconnection of dissociated components of the emotion schemas occurs through their being activated and held in working memory. The effectiveness of interventions to facilitate such connection depends on gradual development of the therapeutic relationship, the converse of the etiology of a dissociated schema.

This article has two basic themes, and they interact. One is a general epistemological theme: How do the different fields—psychoanalysis, psychology, and neuroscience—with their different levels of explanation, speak to the same clinical issues and account for the same clinical observations? I use the clinical observations given by Bromberg (2003) as the specimen material to be accounted for. The other theme is a specific psychoanalytic theoretical question: to explicate the construct of dissociation and its role in pathology.

I will take my text from a statement by LeDoux (1999):

Modern neuroscience is closely allied with and compatible with experimental psychology, but conceptually is miles away from psychoanalytic theory. If experimental psychology and psychoanalytic theory can be fused, even somewhat, the translation of psychoanalytic concepts into brain mechanisms might be achieved in steps, and less painfully. (p. 45)

That is the theme I would like to emphasize here, with a couple of qualifications. I will restate it from my perspective.

The point is that we need to map psychoanalytic concepts, including clinical concepts, onto psychological mechanisms. That is what Freud tried to do, using the psychology of a century ago; we should be able to do better now. LeDoux (1999) refers to experimental psychology; I'll focus on cognitive psychology, which is the part of the field that is most relevant for developing a psychoanalytic psychology.

The concepts of psychoanalysis concern structures and processes of emotion and mind, and the gains that are sought in psychoanalysis are changes in such structures and processes. These structures and processes have the status of psychological constructs; they exist in the epistemological zone of psychology, not neurology.

This topic of this panel provides a central example of this point. We are concerned here with the concept of dissociation as a psychological construct: How do we define dissociation? What causes it? How do we recognize it? How can it be repaired? We are asking this question in terms of dissociations or disconnections among psychological functions or mechanisms, not about disconnections among physiological mechanisms—although we expect that the psychological functions will be compatible with what is known about the nervous system. Once we have a coherent statement of the psychological mechanisms that underlie concepts of psychoanalytic theory and technique, such as dissociation and its treatment, we can go on and look at the relationship of those mechanisms to brain mechanisms.
Panksepp (1999) makes a similar point:

_Psychoanalysis would be of greater assistance to neuroscience if it would scientifically clarify the consistent patterns within the experiential side of life._... _For psychoanalysis a critical challenge will be the extent to which it can refresh Freudian theory, which now has an unpalatable and distinctly post-Victorian flavor for many, into a modern and dynamic mode of thought that continues to be rejuvenated by the accumulating evidence._ (p. 35)

We cannot rest our clinical concepts such as dissociation on a theory of mind that was developed over a century ago, and we cannot look to another field, such as neuropsychology, to rescue us from our theoretical problems. The failure of the metapsychology has left a vacuum—more specifically, a field characterized by theoretical dissociations—lots of specific clinical theories, lots of jargon, existing uneasily in the same domain of human experience without a network or connections among them.

We need to do our own work in our own house, to make our theoretical categories and concepts consistent and develop some tools to measure them. Once we do our own homework, then we—psychologists and psychoanalysts—can give the neuropsychologists some ideas, and they can give us some, and we can all move forward.

The psychological theory I have proposed, the multiple code theory (Bucci, 1997), is an attempt to provide a general psychological model for psychoanalysis, one that is based on current work in cognitive science but extends this from information processing to emotional information processing. It applies broadly to mental and emotional and bodily functioning as well as to the psychoanalytic process; it accounts for basic concepts and processes of psychoanalysis but is not a psychoanalytic theory per se.

**Psychoanalysis as a Dual or Multiple Code Theory**

The central premise of psychoanalysis, unchanged through its several transformations, is the premise of dual (or multiple) systems of thought. The characterization of the systems has been repeatedly redefined; the premise of multiple systems has remained. In developing his successive models of the psychical apparatus, Freud shifted from qualities (conscious, preconscious, unconscious) to structures (id, ego, superego), then reunited these two forms of organization uneasily in his final summary formulation (Freud, 1940/1964). The polarities of primary versus secondary processes of thought as well as verbal versus nonverbal processes have generally been seen as related to both the qualities and agencies of mind. Correspondence among these dimensions has typically been assumed as a default theoretical position; thus, the contents of the id are seen as unconscious, non-verbal, and characterized by primary process thought, and the features of the ego, as the converse of these. But the theoretical correspondence continually breaks down: Analysts recognize that there may be unconscious functions in the ego, that there are organized unconscious fantasies and systematic communication outside of the verbal mode, and that language may appear in dreams and images in waking life; however, they cannot account for these observations using the Freudian metapsychology in any of its forms. We tend to deny or avoid such inconsistencies, but they constitute a dilemma for psychoanalytic theory and “embarrass” the psychoanalytic methodology, as Arlow (1969) has written. We may also note the duality of the drive theory—eros and the death instincts—existing within the unconscious id zone, and this is essentially orthogonal to the topographical and structural dimensions.

Here is where the multiple code theory enters the scientific discourse: in attempting to represent the multiplicity of systems that characterize human mind and emotion in terms of a coherent psychological theory, and then to map psychoanalytic concepts onto this. As the framework of multiple coding is developed, some concepts of psychoanalysis are redefined, some elaborated, some revised, and some discarded, and the concepts of multiple coding may be reshaped as well. Continuous change of this nature is necessary for any vital and developing field. The multiple code theory focuses on the form and organization of thought and examines the other dimensions as related to these.

I am going to assume a basic knowledge of multiple code theory here and only briefly review the concepts of the theory; then I move on to the application to a formulation of dissociation and its repair in treatment, as shown in the clinical material presented by Bromberg (2003). The basic view of the human psyche as incorporated in multiple code theory is as a multiple-format information processor—including emotional information—with substantial but partial and limited integration among systems. The multiple systems include two basic formats: the symbolic and, what I call, the subsymbolic (or nonsymbolic) codes. Symbols—in the sense used here, not the psychoanalytic sense—are discrete entities that refer to other entities and have the capacity of being combined to make an essentially infinite variety of forms; symbols are familiar to us as images and words. Subsymbolic processing is characterized as formally “analogic,” processed as variation on continuous dimensions, rather than generated through combining discrete elements as in symbolic forms. This is systematic processing that occurs in...
words. Subsymbolic “computations” underlie hundreds of common actions, from recognizing a familiar voice to entering a lane of traffic, and they account as well for complex skills in athletics and for creative work in sciences and the arts. People in all types of creative fields—painters, sculptors, musicians, dancers, geometers, physicists, and many others—operate in highly complex, systematic, and differentiated ways, drawing on capacities of the subsymbolic mode. For all of us, subsymbolic processing accounts for knowing one’s own bodily states and responding to the facial and bodily expressions of others, without being able to measure them in discrete units or to categorize them in symbolic form. These are systematic forms of thought with their own processing rules, different from symbolic processing but equally complex and organized, and equally worthy to be recognized as “thought.”

We know this processing as intuition, the wisdom of the body, and in other related ways. The patient and analyst communicate profoundly in this mode. Reik’s (1948/1964) concept of “listening with the third ear” draws heavily on subsymbolic communication, as I have discussed in detail elsewhere (Bucci, 2001).

Subsymbolic processing is modeled in cognitive science by connectionist or parallel distributed processing systems (McClelland, Rumelhart, & The PDP Research Group, 1989), with the features of dynamical systems, as I have outlined elsewhere (Bucci, 1997). There is support in neurological observations for the operation of this format. Panksepp (1999) refers to global state processes of the brain, which are embodied and fundamentally analog—not able to be simulated by digital algorithms. As he says, the models that can handle the full complexity of emotions in the brain will require dynamic systems approaches that account for such analogic processes.

The distinction between subsymbolic and symbolic processing relates in some ways to the dimensions of the qualities (unconscious vs. preconscious-conscious), structures (id vs. ego), or processes (primary vs. secondary processes) of the psychoanalytic theory; however, subsymbolic processing has a broader scope than any of these—it is systematic processing, not dependent on particular contents, not associated with wish fulfillment, occurring throughout waking, rational adult life. It is a different way of cutting the conceptual pie than the psychoanalytic constructs, but it accounts more consistently for what is central to psychoanalytic theory and technique, as I will try to show.

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1 The possibility of a fourth system that would be characterized as “verbal subsymbolic” remains open to question. Paralinguistic aspects of language (including pausing rhythms and intonation patterns) and aspects of the sound of speech (e.g., as in onomatopoeia or more generally in poetry) may operate on a subsymbolic level, as may emotional vocalizations (e.g., sighing or giggling), but the words of language themselves appear to be intrinsically digital and discrete elements. The operation of a verbal nonsymbolic code needs to be further explored.

2 To review this briefly, a connectionist system is a network with a set of interconnected nodes. The theoretical connectionist networks are designed to model the structure of neural networks, but they are simpler than the actual physical (brain) systems and retain the status of psychological (mental) models. At any given time, each node is in a particular state of arousal, and the state of the system is dependent on the level of arousal of each of the nodes and on the patterns of interconnections and weights. These are determined in large part by learning and experience. The pattern of interconnections and matrix of weights may be described as a dynamical system. Given the input of particular states of arousal for each node, the system of connections and weights assigns new states of arousal for each, which then function as new input. The system continues this iterative process, testing the match with the desired target (entering a busy highway, turning a sail, recognizing a face or voice or a wine) and evaluating the error—the difference between the actual and desired state—until the error is small enough to accept the match.

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The Referential Process

The referential process is the major integrating mechanism of the multiple code system. The three modes—verbal, nonverbal symbolic, and subsymbolic—are connected by the referential process, but only partially and to varying degrees. Some degree of dissociation is inherent in the human multiformat system; the global, analogic subsymbolic sensory and somatic representations can be connected only indirectly to the discrete, abstract symbols of the verbal code.
The referential process usually seems to proceed smoothly, transparently, but the limitations become particularly apparent when one attempts to verbalize an experience that one has never verbalized before, to describe a taste or smell, or teach an athletic or motoric skill, or when one struggles to express an emotion and cannot “find the words.” When we say that we fear that verbalizing something will cause us to lose the nuances, we are recognizing precisely the point I am making here: Nuances are the global analogic stuff; we do indeed lose some of it when we try to connect to the verbal symbol system.

As to the nature of Selden’s growing kindness, Gerty would no more have dared to define it than she would have tried to learn a butterfly’s colours by knocking the dust from its wings. To seize on the wonder would be to brush off its bloom and perhaps see it fade and stiffen in her hand…. (Wharton, 1905/1964, p. 157)

In connecting the analogic processes of the subsymbolic system to the discrete elements of the verbal code, images—the symbolic nonverbal representations—play a pivotal role: They connect in their sensory, modality-bound aspects to the subsymbolic mode; as discrete representational elements (nonverbal symbols), which can be simulated by digital algorithms, they connect to the symbols of the verbal code. We can see images, nonverbal symbols, as the categorizers of the nonverbal system, organizing and chunking the analogic representations and mediating the connection to the systems of symbols and words, permitting us to carry over inner emotional meanings to others.

## Emotion Schemas

The fundamental organizing structures of human emotional life—and probably of other species—are emotion schemas. The emotion schemas are the basis for the emotional evaluations that direct our lives and are the psychic structures with which psychoanalysis is centrally concerned.

The basic psychological construct of the memory schema is based on work in cognitive science by Bartlett (1932), Schank and Abelson (1977), and others. Memory schemas incorporate stored knowledge of all types; they determine how one sees the world and are in turn affected by each new perception. We see all things through the lens of memory schemas; there is no other way, no view of reality outside of this lens. We can deconstruct deconstructionism systematically on this psychological basis.

Emotion schemas are specific types of memory schemas that are built and rebuilt through repeated interactions with mother-other from the beginning of life and that constitute one’s knowledge of one’s self in relation to the interpersonal world. They represent what we desire from others, how we expect them to respond, how we expect to feel. Like all memory schemas, the emotion schemas include components of all three processing systems—nonverbal subsymbolic, nonverbal symbolic, and verbal symbolic—but they are more strongly dominated by sensory and bodily representations and processes than are other knowledge schemas.

The subsymbolic sensory, somatic, and motoric representations constitute the affective core of the emotion schema, the basis on which the organization of the schema is initially built. The affective core is the constant that identifies emotional events and clusters them in categories across varying contexts and contents. Thus, we may feel the same sort of feeling, the same emotion, the same bodily and cognitive functions, with different people, in different places and times. The subsymbolic processes of the affective core organize and determine interpersonal life, in ways that are sometimes not apparent within symbolic modes. The objects and settings of time and place constitute the specific contexts and contents of the emotion schemas, which continue to be elaborated throughout life. One’s representation of one’s self in one’s interpersonal world is continuously developed in this way. Schemas can be more or less integrated with one another, as we develop general prototypic schemas of important other persons in one’s life, or prototypic schemas of one’s self. Each individual develops multiple schemas of mother and others in relation to the self, and multiple schemas of one’s self in relationship to different objects. In integrated functioning, the schemas incorporating the same object are reconcilable; we build up our prototypic emotion schemas of mother in the same way as we build our prototypic perceptual images of her, and we build our prototypic emotion schemas of one’s self in the same way. We also develop prototypic schemas of particular emotions, cutting across objects. Particular constellations of physical activation and response patterns constitute the emotions of anger or terror or love, which can be directed toward many objects.

The basic concept of internalized object representations or object relations is essentially a form of emotion schema, as is Stern’s (1985) concept of Representations of Interactions that have been Generalized (RIGs), Bowlby’s (1969) working models, and Sullivan’s (1953) construct of self-other representations. Damasio’s (1994, 1999) notion of dispositional representations provides a neurological basis for the construct of the emotion schema and supports and extends this concept. The structure of the schema provides the conceptual basis for the processes of transference (and countertransference). The patient plays out...
with the analyst the expectations and responses encapsulated in the emotion schema (as the analyst necessarily does—perhaps in a different way—with the patient).

**Dissociation in the Emotion Schemas**

As the referential process linking subsymbolic and symbolic representations is intrinsically limited, so some degree of dissociation between and within schemas is inherent in the organization of the human psyche. Adaptive emotional functioning depends on sufficient integration of function within the emotion schemas so that the events one confronts in life can be evaluated and distinguished as *supporting or interfering* with the functions that serve to maintain life, the sensory and somatic functions of the affective core. This evaluation will often go on outside of the verbal and even outside of the imagistic zone. When we look at someone, we recognize their facial expression through a corresponding feeling inside ourselves. We may not be able to express it in words, but the feeling inside tells us what the expression “means” in emotional terms, often with evaluation in the sub-symbolic zone only, and determines how we respond, often without explicit evaluation and intent. In adaptive functioning, the organization is continually building and changing; new connections and new distinctions are built into the system. In emotional disorders, the reorganization and reconstruction is blocked, as I discuss further.

I think Bromberg (2003) and I are in essential agreement on this point. What he calls self-other representations relates to my construct of emotion schemas. I would also agree generally with Bromberg concerning etiology. Bromberg (2001, p. 902) says, “much adult pathology may...be the end result of prolonged necessity in infancy to control physiologic and affective states while lacking an experience of human relatedness and its potential for reparation that mediates it.” This is a crucial statement regarding the factors leading to pathology that needs to be explicated and that I return to later—focusing not on degree of physiological and affective activation in itself, on an individual's capacity to

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Pathology, leading to nonveridical perception and inappropriate response, is determined by particular types of dissociation among the components of the emotion schemas and ineffective attempts at repair. Different forms of pathology are determined by dissociation of different levels and degree and by different ways in which the attempts at repair misfire. The process begins with danger, or *experience of danger*, that is sufficiently powerful or has particular features (e.g., conflictual) so as to lead to arousal that is sufficiently intense (or of a particular nature) as to make the individual unable to acknowledge the source of danger.

The dangers may arise through developmental means, such as external traumas or more chronic problems of the caretaking situation. In healthy enough development, affective arousal is managed initially through the soothing, repairing actions of the relationship with the caretaker; the individual gradually develops self-mechanisms of regulating affect based on this model. In pathology, the upsurges are too intense or the soothing and repairing functions of the caretaker are not sufficient, so that adequate self-mechanisms do not develop. A schema of mother as rageful, activating a response of terror or rage in the child, is unbearable—perhaps because of the intensity of the hyperarousal itself, and also because mother is the one to whom the baby turns for comfort or protection in time of terror. The schema of mother as object of terror of rage is incompatible with a schema of mother as necessary protector. A number of possible dissociations may then occur, such as arousal of the affective core of terror with the associated flee or attack responses without recognition or acknowledgment of the object of the affect, or activation of the image of the mother as necessary protector without the corresponding affect of being soothed. The failure to reconcile the relationships that are expressed in the schema—the failure to form an integrated prototypic image of mother incorporating her different ways of being—is related to dissociation within the schemas between the sub-symbolic components of the affective core and the object of the affect. The physiological responses to the attack, the sub-symbolic bodily and sensory components of the emotion schema of danger, are not experienced as related to the source of the danger—the attacker or abuser—who constitutes the symbolic, interpersonal, imagistic component of the schema of danger. This is the psychological definition of dissociation in multiple coding terms.

We could carry through the same account in terms of the development of a self-schema. A schema of self (in relation to others) as autonomous, responsible, a separate being may for some be irreconcilable with a schema of self as loving or being loved.

The point that needs to be emphasized on the basis of this account is that dissociation is the basic mechanism underlying pathology; I understand repression as a category of dissociation, as Freud also did some of the time. One may be aware of the physiological activation, the painful physical arousal, associated with the activated schema of anger or fear, and also aware of aspects of one's history, including the trauma and abuse, but without connecting the two. We see patients telling the stories of their history without emotion, feeling the physiological activation without recognizing its emotional connections.

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regulate such activation, or on experience of human relatedness as such, but on the interaction or balance among them, so that there are many ways for pathology to arise. It is not only the intensity of the threat, the innate or acquired capacity of the person experiencing the trauma, or the failure of the caretaker to provide the soothing and regulating patterns—first externally, then internalized—but rather the interaction among all of these factors that determines emotional dissociation. This helps to explain, among other questions, why some children or adults subjected to trauma develop pathology and others do not; if we knew the weights and interactions, we could make some predictions and study these issues.

Posttraumatic stress disorder (PTSD) involves severe dissociation of the emotion schemas, but again, it will be a function of the weighted factors; that is why PTSD does not occur in all individuals experiencing the same events. I claim that all psychological disorders involve dissociations of varying types and degrees (as well as varying ways to manage the unbearable activation).

Bromberg (2003) is more specific. What he adds to the general multiple coding account are some more specific clinical hypotheses. First, as I understand it, Bromberg specifically identifies the affective hyperarousal that I talk about here as shame, in Sullivan’s (1953) sense of “a traumatic attack upon one’s personal identity, [which]... typically calls forth dissociative processes to preserve selfhood” (Bromberg, 1998, p. 295). I am proposing a more general concept, referring to hyperarousal but leaving the source more general:

1. I can think of alternative motives or forces, for example, to retain an image of an intact and caring caretaker that is needed for the infant to sustain life (rather than necessarily to sustain a sense of selfhood). Perhaps the infant is motivated not to feel rage at the caretaker, perhaps not to feel abandoned and alone; these motivations may be distinct from preserving selfhood or may be related but not equivalent.

2. Perhaps in cases of extreme trauma, such as Adolph, the blocking is direct. Here it is not necessary to invoke threat to self-identity or shame; Adolph has the thalamic route hyperactivated, and so the cortical route has no chance.

In neurophysiological terms, following LeDoux, dissociation as I have outlined it here involves arousal of the affective core without recognition or acknowledgment of the object; thus, it could be characterized as activating the thalamic route, not giving the cortical route time to swing in—or activating mechanisms that prevent or disable the cortical activation.

As LeDoux (1999) points out, it may also happen that in times of stress the dissociation occurs at the time of laying down the memory, so that the physiological activation is never connected in memory to the source of the trauma.

As LeDoux (1999) also said, stress adversely affects the hippocampus. In times of intense stress, the hippocampus may be unable to perform normal functions that create memories. Thus, conscious or explicit or declarative memories of a traumatic event (which I would categorize as symbolic imagistic or verbal) are never formed rather than repressed. Although stress impairs functions of the hippocampus, it also amplifies the functioning of the amygdala (LeDoux, 1996). Thus, implicit or unconscious or non-declarative memories (which I would call subsymbolic memories) are experienced and registered as more intense. The person may experience the amplified subsymbolic, bodily memories without the symbolic ones, without their emotional meaning, without knowledge of why the sensory or bodily experiences are occurring. Thus, if the activation is too intense, connection of the affective core to an object may simply not be developed or may be severely attenuated. A schema of terror or fury may thus involve bodily arousal and action without connection to an object or a self.

** Attempts to Deal With the Affective Hyperarousal

Once dissociation has occurred, the organism continually operates to maintain it. The fundamental means of maintaining dissociation is avoidance, which can have diverse forms and can be successful to varying degrees. One can run away or turn away from an external threat—as we move away when a snake crosses the path or stay away from other threatening situations, when we can. If one cannot run away, for example, from the image of mother as aggressor, one may be able to turn attention away. Traces of the imagery of objects that are the source of the danger trigger continued avoidance: running away from an actual external threat; turning away from one in memory.

Bromberg (2003) characterizes dissociation as a hypnoidal process, isolating the self in pain from the here-and-now aspect
of the interaction causing the pain; he sees this as the primary, “built-in” safety measure. As he explains it, the child/patient knows that “something” is taking place but the meaning of it cannot be processed because, affectively, it is as though the experience is “not happening to me.”

The zones that must be avoided proliferate, leading to the tunnel vision of neurotic life. Peripheral elements of the schema, unrecognized as such, are nevertheless likely to intrude; painful arousal may continue even though attempts are made to avoid the source. Throughout life, if a triggering stimulus activates the painful emotion schema, with its biological and cognitive and behavioral components, but the stimulus is not recognized or the avoidance is not successful, the individual will in some cases try to treat the components of the affective core of the schema as symptoms, or in some cases try to provide meaning for the activated state, to know “why I feel this way.” This is where the compensatory attempts at repair come in. The attempts to treat the symptoms, or to establish substitute meaning, while avoiding connection to the actual aroused schema or triggering event are likely to be destructive in themselves, appearing in such forms as somatization, addictions, eating disorders, and other forms of displacement or action. The specific nature of pathology is determined by both the avoidant dissociation and the particular forms of treatment or substitute symbolizing that are imposed.

Both the avoidance and the spurious attempts at repair prevent the taking in of new emotional information and block the evaluative mechanisms that underlie adaptive functioning. This is essentially the vicious circle that Strachey (1934/1963) writes about, reformulated in the new psychological terms of the multiple code theory.

One cannot distinguish safe situations from dangerous ones, one cannot learn that a person or a situation is fundamentally different from the initial source of the threat, if some unrecognized aspects of a situation—related to what Bromberg calls a warning system—serve as a stimulus to activate the painful dissociated schema, a need to be cared for, a fear of being attacked, a feeling of rage. One cannot reconcile or integrate components of the self schema that are identified as “not me.”

The catch-22 is that the painful arousal that occurs when the schema is activated is real. When a schema is activated in fantasy or in memory, as when it is triggered by a life event, the biochemical and motoric functions of the affective core will be activated in trace form. The person does, in a sense, take in new information each time the schema is activated, but in a dissociated schema, this new information is reinforcing. The painful physical excitation, in trace form, serves as repeated reinforcement of the dissociation;

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reinforcement of the need to turn away, with its broadening neurotic range; and reinforcement of the symptoms that may provide a spurious sense of integration.

The process that I am calling dissociation here relates in part to what LeDoux would account for by the process of conditioned fear. As LeDoux and Gorman (2001) wrote, “the animal has come to fear a stimulus that was, just moments before, meaningless” (p. 1953).

As LeDoux also says, individuals in the grip of conditioned fear “freeze” in their lives:

they become withdrawn, avoidant, and sometimes despondent. Environmental and emotional cues remind them of the traumatic event and trigger autonomic, endocrine, and behavioral responses... This kind of response paralyses the individual and makes the resumption of a normal life extremely difficult. (LeDoux & Gorman, 2001, p. 1954)

The inherent built-in reinforcement of the vicious circle is related to the extreme difficulty of extinction of the pain response. This leads us then to the fundamental question: How can we treat this kind of disorder?

In very important recent research, LeDoux and Gorman (2001) have shown (for rats) that the pathways leading from the central nucleus of the amygdala to the brainstem that initiate defensive freezing and associated autonomic and endocrine reactions can be redirected:

After being fully conditioned, the rats can be given the option of moving to another chamber during the occurrence of the conditioned stimulus. If they do so, the conditioned stimulus is terminated, a condition that signals that the shock will not be coming. The learning of this response requires the diversion of the flow of information leaving the lateral nucleus of the amygdala ...

to the basal nucleus of the amygdala, which projects to motor circuits, rather than to the central nucleus, which engages the passive fear response. It requires that the rat “take action,” which LeDoux characterizes as the neurological equivalent of “getting on with life” (LeDoux & Gorman, 2001, p. 1954).

I think what LeDoux is telling us here is very important. On a basic neurophysiological level, the option of avoiding and taking action keeps the system functional rather than freezing. The system remains in active mode; the organism remains
Can we apply this result to humans? LeDoux himself questions the general applicability of results from animals, such as rats, with little frontal lobe capacity, but he also suggests the possible applicability of this result in the treatment of trauma patients.

I would suggest that this may be a description of one type of avoidance with an attempt at repair that is often successful and even brings its own rewards—accounting, more generally, for how some people seem to do exceptionally well after difficult, even traumatic, childhoods and life experiences. They avoid the source of the dissociation, turning away, going on very actively with aspects of their lives.

On the one hand, this may work well for very specific, very focused trauma (such as that resulting from the events of September 11, 2001) and perhaps for people whose self-other structures, in Bromberg's (2003) terms, are relatively strong and intact, so that they have the capacity to use relationships with others or representations of such relationships to regulate their pain. They may eventually overcome the avoidance on their own, as the hyperarousal subsides and becomes less generalized, or they may need help to overcome the avoidance.

On the other hand, for people who choose this mode more characterologically—avoiding the source of pain and going on actively with their lives—this may be seen as the basic pathological schema of dissociation and spurious repair. For example, rather than somatizing or becoming addicts, they perhaps become workaholics, overachievers, perfectionists. As we see clinically, “going to the other room” in this sense works well for a while, maybe for a whole life for some people. They may get plenty of rewards, intrinsic and extrinsic, for their work, enough to keep going as long as the rewards keep flowing. But depending on the source and degree of the dissociation, they may lead limited emotional lives, constantly having to work to avoid the thoughts, ideas, images, people, and places with the capacity to trigger the dreaded schema—and the stimuli that serve as triggers are likely to proliferate.

If the room in which the conditioned stimulus occurred, the eliciting situation, is too large and all encompassing or if there is not enough space to which to move, the limitations on emotional life will be larger and more severe. As too often happens, events related to the conditioned stimulus become associated with the new room as well, so there are increasing zones to avoid, and this includes relationships with other people. As LeDoux and Gorman (2001) wrote, “the active avoidance behavior would shift from being a way of getting on with life to being part of the pathological reaction” (p. 1955).

At this point, going to another room is not enough. As LeDoux and Gorman (2001) continued, the “more involved and formal procedure of instructed desensitization to the actual fearful context can be undertaken at a later time” (p. 1955).

Here I would turn from instructed desensitization to psychoanalytic methods and approaches. Here is where treatment of humans, with much larger frontal lobe regions, can take a different course.

How can we treat the many different types of schemas that result from avoidance of threat and attempts at repair that work to maintain the dissociation? First I give a multiple code formulation, then I relate it to Bromberg’s (2003) work.

### Phases of the Referential Process and Reconstruction of the Schema

Treatment fundamentally involves new integration within the dissociated and distorted emotion schemas. As Rycroft (1968) wrote,

> the aim of psychoanalytic treatment is not primarily to make the unconscious conscious...but to re-establish the connexion between dissociated psychic functions so that the patient ceases to feel that there is an inherent antagonism between his imaginative and adaptive capacities. (p. 113)

This relates to what I term the mechanisms of the affective core that underlie the organism's satisfaction and survival, that support or interfere with the regulatory functions of life and guide action (registered largely in subsymbolic mode), and the representations of objects that figure in the emotion schemas (registered largely in symbolic format).

The therapeutic process in psychoanalysis—to break the negative self-reinforcement that maintains the avoidant dissociation and bring about integration of the emotion schema—may be formulated in the terms of the referential process as experienced by the patient and also by the analyst. According to the theory of the referential process, as I have written in several publications, change in an emotion schema requires activation of subsymbolic bodily and sensory experience in the session; connecting this experience to images and word (the nonverbal and verbal symbolic modes); then reflecting on this material. Optimally, then, this process leads to change in the emotional meanings of the
somatic experiences and imagery, and modulation of the bodily and emotional responses themselves.

In an optimal associative process, the arousal of peripheral bits of an emotion schema will activate images and memories of episodes that are connected to it; the patient may think of a fantasy, an episode, a memory, a dream, one that perhaps he did not expect to tell. The interactions with the analyst and the images or narratives are metaphors representing aspects of the emotion schemas—the form in which the distorted schema is represented. The stories and the enactments with the analyst have a powerful effect, even if—or especially if—the patient does not understand the meaning of what he tells. The important thing is to get the symbolizing process going, get some referential connections operating. The person is then in a better, more active state to regulate and direct himself. This is an expanded view of the free-association process.

In some ways, this is like LeDoux and Gorman's (2001) study of the effects of moving to another chamber—diverting the flow of information to the circuitry that engages action rather than to the central nucleus that engages the passive fear response. The difference here is that in the associative process as activated in the psychoanalytic setting, we assume that the “other chamber” and the associations to which the patient will move will themselves be determined by the activated emotion schemas—that they are intrinsically related to this. Thus they will bring the patient to some—at least peripheral—representation of the activated schema. The new connections and new categories can then feed back to change the organization of the emotion schemas, including the playing out of the affective core. What I've outlined here is the optimal playing out of the referential process. In many cases, as in those of Tara and William, and in all patients some of the time, the nature of the avoidance is such as to block the referential process from going forth. The patient in the grips of the painful arousal cannot connect even to the memories and images that incorporate the source of the danger; once the schema is activated in the session, the patient is also prevented from connecting to the analyst who is reinforcing the pain. The movement from arousal to narrative to reflection does not occur or occurs only minimally, and the work of the therapist is to enter the process, to enable this movement to occur.

Here is where I have introduced the circle of emotional communication (Bucci, 2001). The patient is communicating to the analyst, in multiple subsymbolic channels, aspects of the emotion schema that has been aroused. The patient's communication activates sub-symbolic experience in the listening analyst and activates a schema composed of the analyst's experience of the patient and of the analyst's own life; the analyst's schema is hopefully not so dissociated, and he has access to representations in the symbolic mode without overwhelmingly painful arousal.

The transformation from knowing in the bodily, sensory, motoric sense to knowing in the symbolic mode—first images, then words—occurs within the analyst's inner experience, in the context of the analyst's own emotion schemas, before “emotional inference” to the patient's experience is made. The analyst then uses his own subsymbolic experience, imagery, and ideas as information concerning the patient's state.

The analyst's goal may now be stated specifically: to intervene in such a way as to enable the patient to make connections within the dissociated schema. There can be many ways to do this, many things that work, that we can now understand as facilitating connection to a symbolic mode—in memory and in the here and now. The analyst may use his own images, drawn from his own associations, whose meaning he may understand only implicitly, as many writers describe and as Bromberg writes about in other cases.

The symptom of Bromberg's (2003) patient William is his cognitive haziness. William has generated a belief in a genetic defect as his explanation for this; in a way, he is acknowledging and accepting his dissociated schema rather than trying to repair it. The activation of the emotion schema of deficit also comes out in William's vision of the analyst as a well-meaning but intellectually limited fool. According to Bromberg, William stays within this dissociated mode for a long time.

What Bromberg (2003) does here is verbally underscore, openly, with considerable affect, in the here and now of the interaction, the moments when Bromberg himself is in a particular state—a state of being intensely aware, even shocked, that William was not dissociating. He uses his own feelings as markers to identify the moments when he experiences William as feeling a particular way. Eventually this has an effect:

Unlike his response to my words earlier in treatment, during this phase, my words were mostly not felt as hollow, devoid of meaning, and immediately gobbled up by a dissociated enactment. I seemed to have a partner in the room. 
with me who would listen—mainly with ambivalence—and more often than not would think about how my perception of things compared with his. It is my belief that this part of him—this “partner”—was best able to share an overlapping space with me when my words matched my perceptual/affective experience of our relationship as it existed at that moment in time, rather than my words being mainly carriers of ideas. When my spontaneous perceptions that matched William's state of mind were engaged by William's perceptions of the same event, then something new would happen—something not predictable from the past. Parenthetically, I might add that it was only from the shared affective/perceptual field that ideas were generated that began to link past and present in a way that felt right, rather than being just persuasive. (Bromberg, 2003, p. 570)

William's feelings are marked, underscored, not questioned or interpreted. The movement to the symbolic mode then happens for William in a limited way in the session Bromberg (2003) describes—not a full narrative but what he presumably intended as a humorous one-liner. This was a metaphor for his emotion schema in ways that were not understood and, for the transference, in ways that could be understood: his vivid image of the village idiot who didn't know the difference between incest and arson and so sadly set fire to his sister.

The image and his recognition on some level that he was talking about the analyst represent some integration of the subsymbolic somatic and sensory components of the schema with its objects, and also some connecting to the other who is concretely present, the analyst; however, this occurs without the actual emotional meaning of the schema being known. The connections constitute temporary repairs of the dissociation, but generally without ownership or agency; each new integration opens new threats, and the cycle repeats.

The sequence of interventions that enable the process to go forward works because the interpersonal context is new. The activation was lower, and maybe the capacity for self-regulation was greater, but the experience of human relatedness was certainly changed. Here is where Bromberg's (2003) specific clinical hypothesis regarding shame— as exacerbated by the intrusion of the therapist, and ultimately as repaired by the therapist—adds the crucial and necessary piece to this process. That is why Bromberg's words by this time were not felt as hollow, devoid of meaning, not immediately gobbled up by a dissociated enactment, why he could have a partner beginning to share an overlapping space. It is in a sense the converse of the development of the dissociated schema as in the example I gave earlier: It is unbearable in development for the same person to be the attacker and the defender; it is similarly unbearable in treatment; the computation will change only as the patient comes to differentiate the interpersonal values in the new setting.

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In the referential process as illustrated by this example, we can find a tripartite convergence among the clinical perspective (represented by Bromberg), the cognitive perspective (represented in multiple coding), and the neuroscience perspective (represented here by LeDoux), with the cognitive concepts operating as mediators.

In Bromberg's (2003) example, the analyst's words that expressed the analyst's perceptions also matched the patient's state as activated in the session. This is essentially a statement of the referential process, emphasizing the interpersonal aspects of this function. This process is also related, in part, to LeDoux's extension of Kihlstrom's (1987) hypothesis concerning factors necessary for an experience to reach conscious awareness: According to LeDoux (1999), emotional experience results when three types of representations coincide in short-term memory: (a) event (stimulus) representations, (b) affective representations activated by stimulus representations, and (c) representations of self. In other words, when working memory represents at the same time the perceptual nature of the external stimulus, plus long-term memories that have been activated by the stimulus, and the activation of the amygdala, these then can combine to give rise to an emotional experience, such as the experience of being afraid.

My claim is that this formulation, which corresponds to what I talk about as the referential process, is the central process by which affect is regulated, dissociation is repaired and the integration of emotion schemas with the self state is potentially brought about, so that the evaluative process of emotions may proceed in an adaptive way. There is support for this in psychological and psychoanalytic research and also in neurophysiological research.

I would like to close with some of the psychological questions we need to address as we go on to build the theoretical framework to account for the psychoanalytic and psychological questions of dissociation and its repair. All of these questions are stated in terms of psychological constructs, not neurological constructs and also not in terms of subjective experience.

1. Are there different levels and types of pathological dissociation with different etiologies and effects? I have suggested two types: (a) within schemas (between the multiple formats of representation: subsymbolic and symbolic nonverbal and verbal) and (b) between schemas (between the multiple schemas of mother, others, and self). What are the relationships among these different levels and types?
2. How do we characterize pathological dissociation, in contrast to the inherently partial and limited integration of schemas in emotional organization? Does adaptive functioning involve a particular level of integration of schemas, potential for integration, or tolerance for dissociation?

3. The implication of the formulation proposed here is that dissociation, rather than repression, is the basic process of pathology, applying at all levels of severity, not trauma only. Therefore, we need to ask, what is the relationship of dissociation to repression as this mechanism is understood psychoanalytically? And by implication, what is the relationship of dissociation and the dimension of consciousness?

4. What is the implication of this formulation with respect to the role of conflict?

5. What is the relationship of dissociation (or the different types of dissociation) and the sense of self?

6. How is dissociation repaired in psychoanalytic treatment (or other ways)? Here we address questions such as, How do we know emotions? What do we know? How do we regulate emotions? What is the role of working memory in the knowing and the regulating of emotions? The role of working memory as a psychological construct needs to be elaborated and understood—not only in making emotional experience conscious but in regulating and changing emotion states. In psychological terms, we may ask, to what extent does the process of change require consciousness, intentionality? Is it necessary to make emotional experience conscious (or even, at the next level, to make it verbal, as psychoanalysis has assumed) to regulate and change emotion schemas, what I call emotion schemas (including change that alters the globally embodied, analogic, subsymbolic, subcortical components, the affective core of the schema)?

7. In neurological terms, to what extent is there cortical involvement, frontal lobe activation, and hippocampal activation (a) in the process of emotional experience and (b) in the process of change?

I expect we can all go on to study questions such as these, on our different levels of explanation and using our different techniques, in the consulting room, in psychological research, and in the neuroscience context.

References


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