CHAPTER TWELVE

The right brain implicit self: A central mechanism of the psychotherapy change process

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After a century of disconnection, psychoanalysis is returning to its psychological *and* biological sources, and this re-integration is generating a palpable surge of energy and revitalization of the field. At the centre of both theoretical and clinical psychoanalysis is the concept of the unconscious. The field's unique contribution to science has been its explorations of the psychic structures and processes that operate beneath conscious awareness in order to generate essential survival functions. In the last ten years implicit unconscious phenomena have finally become a legitimate area of not only psychoanalytic but also scientific inquiry. Writing to the broader field of psychology, Bargh and Morsella (2008: 73) now conclude, "Freud's model of the unconscious as the primary guiding influence over every day life, even today, is more specific and detailed than any to be found in contemporary cognitive or social psychology".

An important catalyst of this rapprochement is the contact point between modern neuropsychoanalysis and contemporary neuroscience. Current neurobiological researchers now conclude, "The right hemisphere has been linked to implicit information processing, as opposed to the more explicit and more conscious processing

tied to the left hemisphere" (Happaney, Zelazo and Stuss 2004: 7). Indeed, over the last two decades I have provided a substantial amount of interdisciplinary evidence which supports the proposition that the early developing right brain generates the implicit self, the human unconscious (Schore 1994, 1997, 2003a, 2005, 2007, 2009b). My ongoing studies in regulation theory focus on the essential right brain structure–function relationships that underlie the psychobiological substrate of the human unconscious, and they attempt to elucidate the origin, psychopathogenesis, and psychotherapeutic treatment of the early forming subjective implicit self.

In this chapter I demonstrate that current clinical and experimental studies of the unconscious, implicit domain can do more than support a clinical psychoanalytic model of treatment, but rather this interdisciplinary information can elucidate the mechanisms that lie at the core of psychoanalysis. The body of my work strongly suggests the following organizing principles. The concept of a single unitary "self" is as misleading as the idea of a single unitary "brain". The left and right hemispheres process information in their own unique fashions, and this is reflected in a conscious left lateralized self system ("left mind") and an unconscious right lateralized self system ("right mind"). Despite the designation of the verbal left hemisphere as "dominant" due to its capacities for explicitly processing language functions, It is the right hemisphere and its implicit homeostatic-survival and affect regulation functions that are truly dominant in human existence (Schore 2003a, 2009b). Over the life span the early-forming unconscious implicit self continues to develop to more complexity, and it operates in qualitatively different ways from the later-forming conscious explicit self. Recall Freud's (1920/1943: 188) assertion that the unconscious is "a special realm, with its own desires and modes of expression and peculiar mental mechanisms not elsewhere operative". In essence, my work is an exploration of this "special realm".

With the emergence of modern neuropsychoanalysis and its direct connections with contemporary neuroscience, the right brain's dominance for an "emotional" and "corporeal" sense of self (Devinsky 2000; Schore 1994) is now common ground to both disciplines. This integration clearly demonstrates that evolutionarily adaptive implicit bodily based socio-emotional functions represent the output of the unique developmental, anatomical, and psychobiological

properties of the right brain. Indeed the implicit functions and structures of the right brain represent the inner world described by psychoanalysis since its inception. From its origin in *The Project for a Scientific Psychology*, Freud's explorations of the deeper levels of the human mind have exposed the illusion of a single state of surface consciousness, and revealed the essential contributions of a biological substratum of unconscious states that indelibly impact all levels of human existence. The temporal difference of right implicit and left explicit processing is described by Buklina (2005: 479):

> [T]he more "diffuse" organization of the right hemisphere has the effect that it responds to any stimulus, even speech stimuli, more quickly and, thus earlier. The left hemisphere is activated after this and performs the slower semantic analysis ... the arrival of an individual signal initially in the right hemisphere and then in the left is more "physiological". (See Figure 1.)

Another reason for the strong attraction of psychoanalysis to the right brain is found in its unique survival functions, processes that are disturbed in various psychopathologies. Schutz (2005) highlights the adaptive functions uniquely subserved by this "emotional brain":

> The right hemisphere operates a distributed network for rapid responding to danger and other urgent problems. It preferentially processes environmental challenge, stress and pain and manages self-protective responses such as avoidance and escape ... Emotionality is thus the right brain's "red phone", compelling the mind to handle urgent matters without delay. (p. 15)

A more profound and comprehensive understanding of the organizing principles of this rapid acting and therefore non-conscious right brain "physiological" implicit core system can provide not only essential and relevant clinical and experimental data, but also a theoretical lens which can illuminate and penetrate the fundamental problems addressed by psychoanalytic science. Just as studies of the left brain, dominant for language and verbal processing, can never elucidate the unique non-verbal functions of the right, studies of the output of the explicit functions of the conscious mind in verbal transcripts or narratives can never reveal the implicit psychobiological

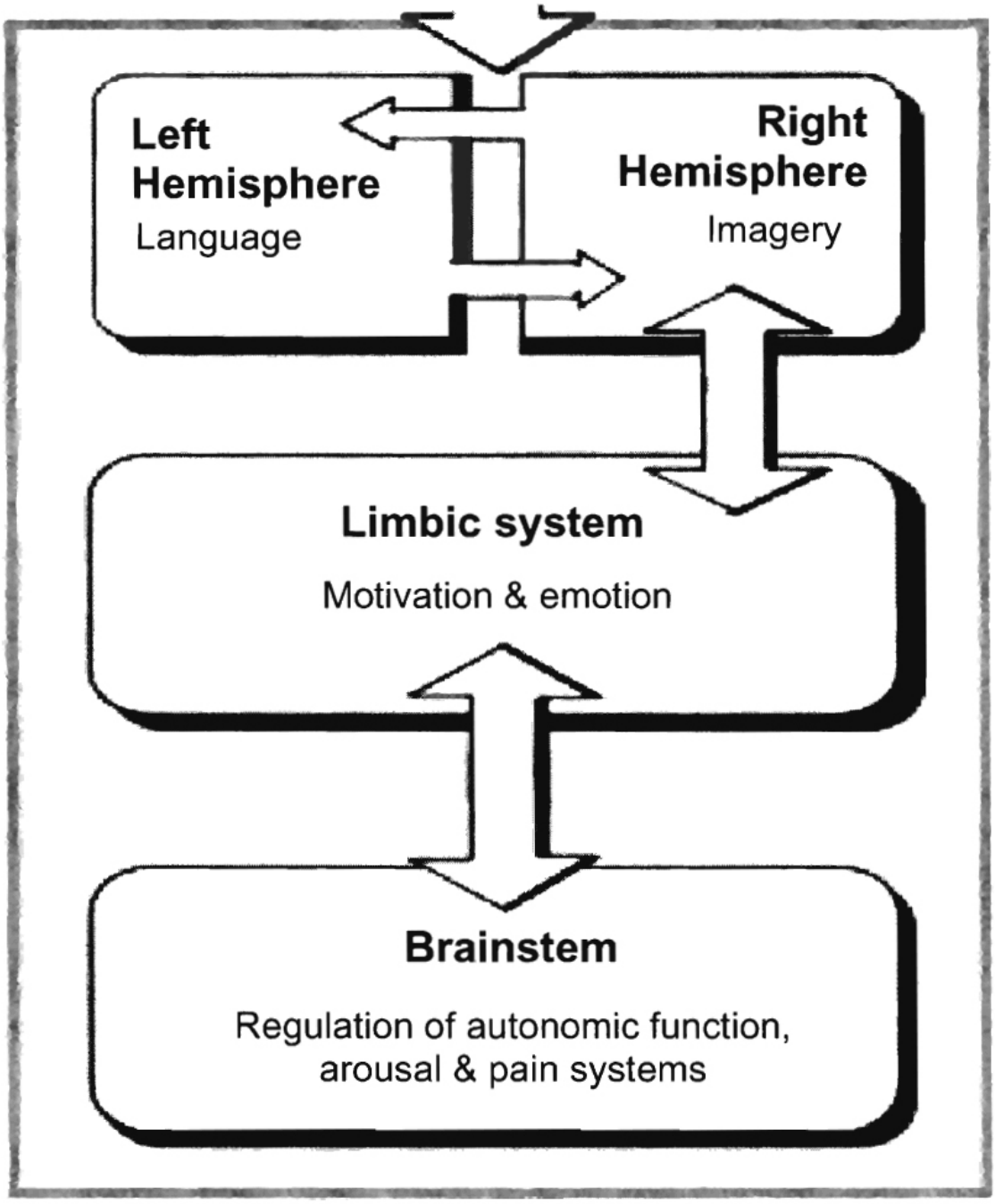

Figure 1. Implicit processing of right brain and subsequent connections into left brain explicit system.

dynamics of the unconscious mind (Schore 1994, 2002, 2003a; Schore and Schore 2008).

This neuropsychoanalytic perspective echoes Freud's fundamental assertion that the central questions of the human condition, which psychoanalysis directly addresses, can never be found in knowledge of how the conscious mind of the explicit self system works, but rather in a deeper understanding of the implicit psychobiological mechanisms of the unconscious mind. Other fields of study are currently

appreciating the importance of this unconscious realm in all levels of human existence. Thus not only psychoanalysis but a large number of disciplines in both the sciences and the arts are experiencing a paradigm shift from explicit conscious cognition to implicit unconscious affect. In a recent editorial of the journal *Motivation and Emotion*, Richard Ryan asserts, "After three decades of the dominance of cognitive approaches, motivational and emotional processes have roared back into the limelight" (2007: 1). A large number of interdisciplinary studies are converging upon the centrality of these implicit right brain motivational and emotional processes that are essential to adaptive functioning.

Right brain implicit processes in contemporary psychoanalysis

In this section I describe a surface, verbal, conscious, analytic explicit self versus a deeper non-verbal, non-conscious, holistic, emotional corporeal implicit self. These two lateralized systems contain qualitatively different forms of cognition and therefore ways of "knowing", as well as different memory systems and states of consciousness. But I will argue that implicit (non-conscious) functions are much more than just learning, memory, and attention, processes highlighted by cognitive psychology. A psychological theory of cognition, even unconscious cognition, cannot penetrate the fundamental questions of development, psychopathology, and the change process of psychotherapy.

In addition to implicit cognition (right brain unconscious processing of exteroceptive information from the outer world and interoceptive information from the inner world) the implicit concept also includes implicit affect, implicit communication, and implicit self-regulation. The ongoing paradigm shift from the explicit cognitive to the implicit affective realm is driven by both new experimental data on emotional processes and updated clinical models for working with affective systems.

Freud (1915) stressed that the work of psychotherapy is always concerned with affect states. In my first book, I expanded upon this therapeutic principle, asserting that affects are "the center of empathic communication" and that "the regulation of conscious *and* unconscious feelings is placed in the center of the clinical stage"

(Schore 1994: 448–449). Consonant with these ideas, the essential clinical role of implicit affect is underscored in current neuroscience research reporting that unconscious processing of emotional stimuli is specifically associated with activation of the right and not left hemisphere (Morris, Ohman and Dolan 1998), and documenting a "right hemispheric dominance in processing of unconscious negative emotion" (Sato and Aoki 2006: 261) and a "cortical response to subjectively unconscious danger" (Carretie 2005: 615). This work establishes the validity of the concept of unconscious (and also dissociated) affect, a common focus of the treatment of pathological defences.

In this same volume I offered a model of implicit communications within the therapeutic relationship, whereby transference–countertransference right brain to right brain communications represent interactions of the patient's unconscious primary process system and the therapist's primary process system (Schore 1994, 2009c). Neuroscience documents that although the left hemisphere mediates most linguistic behaviours, the right hemisphere is important for the broader aspects of communication. This research also indicates that "the right hemisphere operates in a more free-associative, primary process manner, typically observed in states such as dreaming or reverie" (Grabner et al. 2007: 228).

Congruent with this model, Dorpat (2001) describes the implicit process of "primary process communication" expressed in "both body movements (kinesics), posture, gesture, facial expression, voice inflection, and the sequence, rhythm, and pitch of the spoken words" (p. 451). According to his formulation affective and object-relational information are transmitted predominantly by primary process communication, while secondary process communication has a highly complex and powerful logical syntax but lacks adequate semantics in the field of relationships. In light of the fact that the left hemisphere is dominant for language but the right is dominant for emotional communication, I have proposed that the psychotherapy process is best described not as "the talking cure" but "the communicating" cure (Schore 2005: 841). Chused (2007) now asserts, "I suspect our field has not yet fully appreciated the importance of this implicit communication" (p. 879).

With regard to implicit cognition, I have recently suggested that primary process cognition underlies clinical intuition, a major factor

in therapeutic effectiveness (Schore and Schore 2008). Indeed, the definition of intuition, "the ability to understand or know something immediately, without conscious reasoning" (Compact Oxford English Dictionary) clearly implies right and not left brain processing. Bohart (1999) contends that in the psychotherapy context, "what I extract perceptually and intuitively from lived experience is far more compelling that thought information" (p. 294). In an important article on this theme, Welling (2005) concludes that the psychotherapist who considers his or her methods and decisions to be exclusively the result of conscious reasoning is most likely mistaken. He asserts that no therapist can reasonably deny following hunches, experiencing sudden insights, choosing directions without really knowing why or having uncanny feelings that turn out to be of great importance for therapy, and points out that all these phenomena are occurrences of intuitive modes of functioning.

The central theme in all of my writings is the essential function of implicit affect regulation in the organization of the self. Citing my work, Greenberg (2007) proposes:

> ... an issue of major clinical significance then is generating theory and research to help understand to what extent automatic emotion processes can be changed through deliberate processes and to what extent only through more implicit processes based on new emotional and/or relational experiences. Stated in another way the question becomes how much emotional change requires implicit experiential learning vs. explicit conceptual learning. (p. 414)

In agreement with current trends in modern relational psychoanalysis Greenberg (2008: 414) concludes, "The field has yet to play adequate attention to implicit and relational processes of regulation". Recall that an inability to implicitly regulate the intensity of emotions is a major outcome of early relational trauma, a common history of a large number of psychiatric disorders.

In the following I overview my work on the centrality of unconscious processes and right brain structures from the perspective of regulation theory (Schore 1994, 2003 a, b). I begin with a description of implicit affective processes in psychotherapeutic change processes. I then focus on the expression of right brain unconscious

mechanisms in affect-laden enactments and in the therapist's moment-to-moment navigation through these heightened affective moments by not explicit secondary process cognition, but by implicit primary process clinical intuition. Direct access to implicit processes will be shown to be central to effective treatment.

Right brain implicit processes in psychotherapy

Over the course of my work I have provided interdisciplinary evidence to show that implicit right brain to right brain attachment transactions occur in both the caregiver–infant and the therapist–patient relationships (the therapeutic alliance). I suggest that not left brain verbal explicit patient–therapist discourse but right brain implicit non-verbal affect-laden communication directly represents the attachment dynamic embedded within the alliance. During the treatment, the empathic therapist is consciously, explicitly attending to the patient's verbalizations in order to objectively diagnose and rationalize the patient's dysregulating symptomatology. But she is also listening and interacting at another level, an experience-near subjective level, one that implicitly processes moment-to-moment socio-emotional information at levels beneath awareness (Schore 2003a). Just as the left brain communicates its states to other left brains via conscious linguistic behaviours so the right non-verbally communicates its unconscious states to other right brains that are tuned to receive these communications.

On this matter Stern (2005) suggests:

> Without the nonverbal it would be hard to achieve the empathic, participatory, and resonating aspects of intersubjectivity. One would only be left with a kind of pared down, neutral 'understanding' of the other's subjective experience. One reason that this distinction is drawn is that in many cases the analyst is consciously aware of the content or speech while processing the nonverbal aspects out of awareness. With an intersubjectivist perspective, a more conscious processing by the analyst of the nonverbal is necessary. (p. 80)

Studies show that sixty per cent of human communication is non-verbal (Burgoon 1985).

Writing on therapeutic "nonverbal implicit communications" Chused (2007) asserts that, "it is not that the information they contain cannot be verbalized, only that sometimes only a non-verbal approach can deliver the information in a way it can be used, particularly when there is no conscious awareness of the underlying concerns involved" (p. 879). These ideas are echoed by Hutterer and Liss (2006), who state that non-verbal variables such as tone, tempo, rhythm, timbre, prosody, and amplitude of speech, as well as body language signals may need to be re-examined as essential aspects of therapeutic technique. It is well established that the right hemisphere is dominant for non-verbal (Benowitz et al. 1983) and emotional (Blonder, Bowers and Heilman 1991) communication.

Recent neuroscientific information about the emotion-processing right brain is also directly applicable to models of the psychotherapy change process. Uddin et al. (2006) conclude, "The emerging picture from the current literature seems to suggest a special role of the right hemisphere in self-related cognition, own body perception, self-awareness and autobiographical memories" (p. 65). This hemisphere is centrally involved in "implicit learning" (Hugdahl 1995: 235), and implicit relational knowledge stored in the non-verbal domain is currently proposed to be at the core of therapeutic change (Stern et al. 1998).

Describing the right hemisphere as "the seat of implicit memory", Mancia (2006) observes that, "the discovery of the implicit memory has extended the concept of the unconscious and supports the hypothesis that this is where the emotional and affective—sometimes traumatic—presymbolic and preverbal experiences of the primary mother-infant relations are stored" (p. 83). Right brain autobiographical memory (Markowitsch et al. 2000), which stores insecure attachment histories, is activated in the therapeutic alliance, especially under relational stress. Cortina and Liotti (2007) point out that "experience encoded and stored in the implicit system is still alive and carried forward as negative expectations in regard to the availability and responsiveness of others, although this knowledge is unavailable for conscious recall" (p. 207). Such affective memories are transmitted within the therapeutic alliance. These affective communications "occur at an implicit level of rapid cueing and response that occurs too rapidly for simultaneous verbal transaction and conscious reflection" (Lyons-Ruth 2000: 91–92).

More specifically, spontaneous non-verbal transference–countertransference interactions at preconscious–unconscious levels represent implicit right brain to right brain face-to-face non-verbal communications of fast acting, automatic, regulated, and especially dysregulated bodily based stressful emotional states between patient and therapist (Schore 1994, 2009c). Transference is thus an activation of right brain autobiographical memory, as autobiographical negatively valenced, high intensity emotions are retrieved from specifically the right (and not left) medial temporal lobe (Buchanan, Tranel and Adolphs 2006). Updated neuropsychoanalytic models of transference (Pincus, Freeman, and Modell 2007) contend that "no appreciation of transference can do without emotion" (p. 634), and that "transference is distinctive in that it depends on early patterns of emotional attachment with caregivers" (p. 636). Current clinical models define transference as a selective bias in dealing with others that is based on previous early experiences and which shapes current expectancies, and as an expression of the patient's implicit perceptions and implicit memories (Schore 2003a, 2009c).

Right brain implicit processes in clinical enactments

The quintessential clinical context for a right brain transferential–countertransferential implicit communication of a dysregulated emotional state is the heightened affective moment of a clinical enactment. There is now agreement that enactments, "events occurring within the dyad that both parties experience as being the consequence of behavior in the other" (McLaughlin 1991: 611), are fundamentally mediated by non-verbal unconscious relational behaviours within the therapeutic alliance (Schore 2003a). These are transacted in visual-facial, auditory-prosodic, and tactile-proprioceptive emotionally charged attachment communications, as well as in gestures and body language, rapidly expressed behaviours that play a critical role in the unconscious interpersonal communications embedded within the enactment. This dyadic psychobiological mechanism allows for the detection of unconscious affects, and underlies the premise that "an enactment, by patient or analyst, could be evidence of something which has not yet been 'felt' by them" (Zanocco et al. 2006: 153).

In my book *Affect Regulation and the Repair of the Self* I offered a chapter entitled "Clinical implications of a psychoneurobiological model of projective identification" (Schore 2003a). This entire chapter on moment-to-moment implicit communications within an enactment focuses on phenomena which take place in "a moment", literally a split second. In it I offer a slow motion analysis of the rapid dyadic psychobiological events that occur in a heightened affective moment of the therapeutic alliance. This analysis discusses how a spontaneous enactment can either blindly repeat a pathological object relation through the therapist's deflection of projected negative states and intensification of interactive dysregulation, or provide a novel relational experience via the therapist's autoregulation of projected negative states and co-participation in interactive repair. Although these are the most stressful moments of the treatment, in an optimal context the therapist can potentially act as an implicit regulator of the patient's conscious and dissociated unconscious affective states. This dyadic psychobiological corrective emotional experience can lead to the emergence of more complex psychic structure by increasing the connectivity of right brain limbic-autonomic circuits.

Consonant with this conception of implicit communication (and citing my right brain neurobiological model), Ginot (2007) concludes, "Increasingly, enactments are understood as powerful manifestations of the intersubjective process and as inevitable expressions of complex, though largely unconscious self-states and relational patterns" (p. 317). These unconscious affective interactions "bring to life and consequently alter implicit memories and attachment styles" (p. 317). She further states that such intense manifestations of transference–countertransference entanglements "generate interpersonal as well as internal processes eventually capable of promoting integration and growth" (pp. 317–318).

In a parallel work, Zanocco et al. (2006: 145) characterizes the critical function of empathic physical sensations in the enactment and their central role in "the foundation of developing psychic structure of a human being". Enactments reflect "processes and dynamics originating in the primitive functioning of the mind", and they involve the analyst accomplishing a way of interacting with those patients who are not able to give representation to their instinctual impulses. These early "primary" activities are expressed in "an unconscious mental activity which does not follow the

rules of conscious activity. There is no verbal language involved. Instead, there is a production of images that do not seem to follow any order, and, even less, any system of logic" (p. 145). Note the implications to implicit primary process cognition and right brain representations.

It is important to repeat the fact that the relational mechanism of enactments is especially prominent during stressful ruptures of the therapeutic alliance. Enactments occur at the edges of the regulatory boundaries of affect tolerance (Schore 2009b, 2009c), or what Lyons-Ruth (2005) describes as the "fault lines" of self-experience where "interactive negotiations have failed, goals remain aborted, negative affects are unresolved, and conflict is experienced" (p. 21). However, neuroscientists are describing "neuroplasticity in right hemispheric limbic circuitry in mediating long-lasting changes in negative affect following brief but severe stress" (Adamec, Blundell and Burton 2003: 1,264). Thus, an enactment can be a turning point in an analysis in which the relationship is characterized by a mode of resistance/counterresistance (Zanocco et al. 2006), but these moments call for the most complex clinical skills of the therapist.

This is due to the fact that such heightened affective moments induce the most stressful countertransference responses, including the clinician's implicit coping strategies that are formed in his/her own attachment history. Davies (2004) documents, "It seems to me intrinsic to relational thinking that these 'bad object relationships' not only will but must be reenacted in the transference–countertransference experience, that indeed such reenacted aggression, rage, and envy are endemic to psychoanalytic change within the relational perspective" (p. 714). It is important to note that enactments represent communications of not only stressful conscious affects, but also unconscious affects. Recall the "right hemispheric dominance in processing of unconscious negative emotion" (Sato and Aoki 2006). Very recent work in interpersonal neurobiology, attachment theory, and traumatology equates unconscious affect with dissociated affect (Schore 2007, 2009a, 2009b, 2009c, in press). Bromberg (2006) reports, "Clinically, the phenomenon of dissociation as a defense against self-destabilization ... has its greatest relevance during enactments, a mode of clinical engagement that requires an analyst's closest attunement to the unacknowledged affective shifts in his [*sic*] own and the patient's self-states" (p. 5).

On the other hand, Plakun (1999) observes that the therapist's "refusal of the transference", particularly the negative transference, is an early manifestation of an enactment. The therapist's "refusal" is expressed implicitly and spontaneously in non-verbal communications, not explicitly in the verbal narrative. A relational perspective from dynamic system theory clearly applies to the synergistic effects of the therapist's transient or enduring countertransferential "mindblindness" and the patient's negatively biased transferential expectation in the co-creation of an enactment. Feldman (1997) notes that, the fulminating negative state "may evoke forms of projection and enactment by the analyst, in an attempt at restoring an internal equilibrium, of which the analyst may initially be unaware" (p. 235).

Making this work even more emotionally challenging, Renik (1993) offers the important observation that countertransference enactments cannot be recognized until one is already in them. Rather spontaneous activity is expressed by the clinician's right brain, described by Lichtenberg, Lachmann, and Fosshage (1996: 213–214) as a "disciplined spontaneous engagement". These authors observe that such events occur "at a critical juncture in analysis" and they are usually prompted by some breach or miscommunication that requires "a human response". Although there is a danger of "exchanges degenerating into mutually traumatizing disruptions" that "recreate pathogenic expectations", the clinician's communications signal a readiness to participate authentically in the immediacy of an enactment. This is spontaneously expressed in the clinician's facial expressions, gestures, and unexpected comments that result from an "unsuppressed emotional upsurge". These communications seem more to pop out than to have been planned or edited, and they provide "intense moments that opened the way for examination of the role enactments into which the analyst had fallen unconsciously".

These "communications" are therefore right brain primary process emotional and not left brain rational logical secondary process communications. Thus explicit, conscious, verbal voluntary responses are inadequate to prevent, facilitate, or metabolize implicit emotional enactments. Bromberg (2006) refers to this in his assertion, "An interpretative stance ... not only is thereby useless during an enactment, but also escalates the enactment and rigidifies the dissociation"

(p. 8). Andrade (2005) concludes: "As a primary factor in psychic change, interpretation is limited in effectiveness in pathologies arising from the verbal phase, related to explicit memories, with no effect in the pre-verbal phase where implicit memories are to be found. Interpretation—the method used to the exclusion of all others for a century—is only partial; when used in isolation it does not meet the demands of modern broad-based-spectrum psychoanalysis" (p. 677).

But if not an explicit analytic insight–directed response, then what type of implicit cognition would the therapist use in order to guide him or herself through stressful negative affective states, such as terror, rage, shame, disgust, and so on? What implicit right brain coping strategy could not only autoregulate the intense affect, but at the same time allow the clinician to maintain "an attunement to the unacknowledged affective shifts in his own and the patient's self-states"?

Right brain implicit processes and clinical intuition

In my introduction I proposed that the therapist's moment-to-moment navigation through these heightened affective moments occurs by not explicit verbal secondary process cognition, but rather by implicit non-verbal primary process clinical intuition. From a social neuroscience perspective, intuition is now being defined as "the subjective experience associated with the use of knowledge gained through implicit learning" (Lieberman 2000: 109). The description of intuition as "direct knowing that seeps into conscious awareness without the conscious mediation of logic or rational process" (Boucouvalas 1997: 7), clearly implies a right and not left brain function. Bugental (1987) refers to the therapist's "intuitive sensing of what is happening in the patient back of his [*sic*] words and, often, back of his conscious awareness" (p. 11). In his last work Bowlby (1991) speculated, "Clearly the best therapy is done by the therapist who is naturally intuitive and also guided by the appropriate theory" (p. 16).

In a groundbreaking article Welling (2005) notes that intuition is associated with pre-verbal character, affect, sense of relationship, spontaneity, immediacy, gestalt nature, and global view (all functions of the holistic right brain). He further discusses that "there is no cognitive theory about intuition" (p. 20), and therefore "what is needed is a model that can describe the underlying formal process

that produces intuition phenomena" (pp. 23–24). Developmental psychoanalysis and neuropsychoanalysis can make important contributions to our understanding of the sources and mechanism of not only maternal but clinical intuition. With allusions to the right brain, Orlinsky and Howard (1986) contend that the "non-verbal, prerational stream of expression that binds the infant to its parent continues throughout life to be a primary medium of intuitively felt affective-relational communication between persons" (p. 343). There are thus direct commonalities between the spontaneous responses of the maternal intuition of a psychobiologically attuned primary caregiver and the intuitive therapist's sensitive countertransferential responsiveness to the patient's unconscious non-verbal affective bodily based implicit communications.

In the neuroscience literature, Volz and von Cramon (2006) conclude that intuition is related to the unconscious, and is "often reliably accurate" (p. 2,084). It is derived from stored non-verbal representations, such as "images, feelings, physical sensations, metaphors" (note the similarity to primary process cognition) (ibid.). Intuition is not expressed in language but rather is "embodied" in a "gut feeling" or in an initial guess that subsequently biases our thought and inquiry. "The gist information is realized on the basis of the observer's implicit knowledge rather than being consciously extracted on the basis of the observer's explicit knowledge" (ibid.).

With direct relevance to the concept of somatic countertransference, cognitive neuroscience models of intuition are highlighting the adaptive capacity of "embodied cognition". Allman et al. (2005) assert, "We experience the intuitive process at a visceral level. Intuitive decision making enables us to react quickly in situations that involve a high degree of uncertainty; situations which commonly involve social interactions" (p. 370). These researchers demonstrate that right prefrontal-insula and anterior cingulate relay a fast intuitive assessment of complex social situations in order to allow the rapid adjustment of behaviour in quickly changing circumstances. This lateralization is also found in a neuro-imaging study by Bolte and Goschke (2005), who suggest that association areas of the right hemisphere may play a special role in intuitive judgements.

In parallel psychoanalytic work, Marcus (1997) observes, "The analyst, by means of reverie and intuition, listens with the right brain to the analysand's right brain" (p. 238). Other clinicians

hypothesize that the intuition of an experienced expert therapist lies fundamentally in a process of unconscious pattern matching (Rosenblatt and Thickstun 1994), and that this pattern recognition follows a non-verbal path, as verbal activity interferes with achieving insight (Schooler and Melcher 1995). Even more specifically, Bohart (1999: 298) contends that intuition involves the detection of "patterns and rhythms in interaction". But if not verbal stimuli, then which patterns are being intuitively tracked?

Recall, "transference is distinctive in that it depends on early patterns of emotional attachment with caregivers" (Pincus et al. 2007), and that enactments are powerful expressions of "unconscious self-states and relational patterns" (Ginot 2007). Indeed, updated models of psychotherapy describe the primacy of "making conscious the organizing patterns of affect" (Mohaupt et al. 2006: 243). van Lancker and Cummings (1999) assert, "Simply stated, the left hemisphere specializes in analyzing sequences, while the right hemisphere gives evidence of superiority in processing patterns" (p. 95). Thus I have suggested that the intuitive psychobiologically attuned therapist, on a moment-to-moment basis, implicitly tracks and resonates with the patterns of rhythmic crescendos/decrescendos of the patient's regulated and dysregulated states of affective arousal. Thus, intuition represents a complex right brain primary process, affectively charged embodied cognition that is adaptive for implicitly processing novelty, including object relational novelty, especially in moments of relational uncertainty.

Welling (2005) offers a phase model, in which the amount of information contained in the intuition increases from one phase to another, resulting in increased levels of complexity. An early "detection phase" related to "functions of arousal and attention" culminates in a "metaphorical solution phase", in which the intuition presents itself in the form of kinesthetic sensations, feelings, images, metaphors, and words. Here the solution, which has an emotional quality, is revealed, but in a veiled non-verbal form. These descriptions reflect the activity of the right hemisphere, which is dominant for attention (Raz 2004), kinesthesia (Naito et al. 2005), and the processing of novel metaphors (Mashal et al. 2007).

Phases of intuitive processing are thus generated in the therapists's subcortical-cortical vertical axis of the right brain, from the right amygdala to the right orbitofrontal system (see Figure A-2 in Schore

2003a). The orbital frontolimbic cortex, the highest level of the right brain would act as an "inner compass that accompanies the decoding process of intuition" (Welling 2005: 43). The orbitofrontal system, the "senior executive of the emotional brain" (Joseph 1996), is specialized to act in contexts of "uncertainty or unpredictability" (Elliott, Dolan, and Frith 2000). It functions as a dynamic filter of emotional stimuli (Rule, Shimamura, and Knight 2002) and provides "a panoramic view of the entire external environment, as well as the internal environment associated with motivational factors" (Barbas 2007: 239). It also formulates a theory of mind, "a kind of affective-decision making" (Happeney et al. 2004: 4), and thereby is centrally involved in "intuitive decision-making" (Allman et al. 2005: 369).

I have suggested that the right orbitofrontal cortex and its subcortical and cortical connections represent what Freud described as the preconscious (Schore 2003a). Alluding to preconscious functions, Welling (2005) describes intuition as:

> ... a factory of pieces of thoughts, images, and vague feelings, where the raw materials seem to float around half formless, a world so often present, though we hardly ever visit it. However, some of these floating elements come to stand out, gain strength, or show up repeatedly. When exemplified, they may be easier to recognize and cross the border of consciousness. (p. 33)

Over the course of the treatment the clinician accesses this preconscious domain, as does the free associating patient. Rather than the therapist's technical explicit skills the clinician's intuitive implicit capacities may be responsible for the outcome of an affectively charged enactment, and may dictate the depth of the therapeutic contact, exploration, and change processes.

Right brain implicit process central to change: Affect regulation

According to Ginot (2007), "This focus on enactments as communicators of affective building blocks also reflects a growing realization that explicit content, verbal interpretations, and the mere act of uncovering memories are insufficient venues for curative shifts" (p. 317). This clearly implies that the resolution of œ involves more

than the standard Freudian idea of making the unconscious conscious. Not these explicit factors, then what implicit therapeutic experience is essential to the change process, especially in developmentally impaired personalities who are not psychologically minded? At the base the implicit change mechanism must certainly include a dysregulating affective experience that is communicated to an empathic other.

But in addition, the relational context must also afford an opportunity for interactive affect regulation, the core of the attachment process. Ogden and her colleagues (2005) conclude:

> Interactive psychobiological regulation (Schore, 1994) provides the relational context under which the client can safely contact, describe and eventually regulate inner experience ... [It] is the patient's experience of empowering action in the context of safety provided by a background of the empathic clinician's psychobiologically attuned interactive affect regulation that helps effect ... change. (p. 22)

It is the regulation of stressful and disorganizing high or low levels of affective-autonomic arousal that allows for the repair and re-organization of the right lateralized implicit self, the biological substrate of the human unconscious.

A cardinal principle of affective science dictates that a deeper understanding of affective processes is closely tied to the problem of the regulation of these processes. Affect regulation, a central mechanism of both development and the change process of psychotherapy, is usually defined as a set of conscious control processes by which we influence, consciously and voluntarily, the conscious emotions we have, and how we experience and express them. In a groundbreaking article in the clinical psychology literature, Greenberg (2007: 415) describes a "self-control" form of emotion regulation involving higher levels of cognitive executive function that allows individuals "to change the way they feel by consciously changing the way they think". This explicit form of affect regulation is performed by the verbal left hemisphere, and unconscious bodily based emotion is usually not addressed in this model. Notice this mechanism is at the core of insight, heavily emphasized in therapeutic models of not only classical psychoanalysis but also cognitive behavioural therapy.

In contrast to this conscious emotion regulation system, Greenberg (2007) describes a second, more fundamental implicit affect regulatory process performed by the right hemisphere. This system rapidly and automatically processes facial expression, vocal quality, and eye contact in a relational context. Therapy attempts not control but the "acceptance or facilitation of particular emotions", including "previously avoided emotion", in order to allow the patient to tolerate and transform them into "adaptive emotions". Citing my work he asserts, "It is the building of implicit or automatic emotion regulation capacities that is important for enduring change, especially for highly fragile personality-disordered clients" (Greenberg 2007: 416).

Even more than the patient's late acting rational, analytical, and verbal left mind, the growth-facilitating psychotherapeutic relationship needs to directly access the deeper psychobiological strata of the implicit regulatory structures of both the patient's and the clinician's right minds. Effective psychotherapy of attachment pathologies and severe personality disorders must focus on unconscious affect and the survival defense of pathological dissociation, "a structured separation of mental processes (e.g., thoughts, emotions, conation, memory, and identity) that are ordinarily integrated" (Spiegel and Cardeña 1991: 367). The clinical precept that unregulated overwhelming traumatic feelings can not be adaptively integrated into the patient's emotional life is the expression of a dysfunction of "the right hemispheric specialization in regulating stress—and emotion-related processes" (Sullivan and Dufresne 2006). As described earlier, this dissociative deficit specifically results from a lack of integration of the right lateralized limbic-autonomic circuits of the emotional brain (see Figure 1).

But recall Ginot's assertion that enactments "generate interpersonal as well as internal processes eventually capable of promoting integration and growth". Indeed, long-term psychotherapy can positively alter the developmental trajectory of the right brain and facilitate the top-down and bottom-up integration of its cortical and subcortical systems (Schore 2003a, 2007, 2009b, 2009c, in press). These enhanced right amygdala-ventral prefrontolimbic (orbitofrontal) connections allow implicit therapeutic "now moments" of lived interactive experience to be integrated into autobiographical memory. Autobiographical memory, an output of the right brain, is

the highest memory system that consists of personal events with a clear relation to time, space, and context. In this right brain state of autonoetic consciousness the experiencing self represents emotionally toned memories, thereby allowing for "subjective time travel" (Kalbe et al. 2008: 15). The growth-facilitating expansion of interconnectivity within the unconscious system also promotes an increased complexity of defences, right brain coping strategies for regulating stressful affects that are more flexible and adaptive than pathological dissociation. This therapeutic mechanism supports the possible integration of what Bromberg (2006) calls "not-me" states into the implicit self.

Indeed, these developmental advances of the right lateralized vertical axis facilitate the further maturation of the right brain core of the self and its central involvement in "patterns of affect regulation that integrate a sense of self across state transitions, thereby allowing for a continuity of inner experience" (Schore 1994: 33). These neurobiological re-organizations of the right brain human unconscious underlie Alvarez's (2006) assertion, "Schore points out that at the more severe levels of psychopathology, it is not a question of making the unconscious conscious: rather it is a question of restructuring the unconscious itself" (p. 171).

Earlier I suggested that the right hemisphere is dominant in the change process of psychotherapy. Neuroscience authors are concluding that although the left hemisphere is specialized for coping with predictable representations and strategies, the right predominates for coping with and assimilating novel situations (Podell et al. 2001) and ensures the formation of a new programme of interaction with a new environment (Ezhov and Krivoschchekov 2004). Indeed, "The right brain possesses special capabilities for processing novel stimuli ... Right-brain problem solving generates a matrix of alternative solutions, as contrasted with the left brain's single solution of best fit. This answer matrix remains active while alternative solutions are explored, a method suitable for the open-ended possibilities inherent in a novel situation". (Schutz 2005: p. 13)

The functions of the emotional right brain are essential to the self-exploration process of psychotherapy, especially of unconscious affects that can be potentially integrated into a more complex implicit sense of self. At the most essential level, the work of psychotherapy is not defined by what the therapist explicitly, objectively does for

the patient, or says to the patient. Rather the key mechanism is how to implicitly and subjectively be with the patient, especially during affectively stressful moments when the "going-on-being" of the patient's implicit self is dis-integrating in real time.

References

Adamec, R.E., Blundell, J. and Burton, P. (2003). "Phosphorylated cyclic AMP response element bonding protein expression induced in the periaqueductal gray by predator stress; its relationship to the stress experience, behavior, and limbic neural plasticity". *Progress in Neuro-Pharmacology & Biological Psychiatry*. 27: 1,243–1,267.

Allman, J.M., Watson, K.K., Tetreault, N.A. and Hakeem, A.Y. (2005). "Intuition and autism: a possible role for Von Economo neurons". *Trends in Cognitive Sciences*. 9: 367–373.

Alvarez, A. (2006). "Some questions concerning states of fragmentation: unintegration, under-integration, disintegration, and the nature of early integrations". *Journal of Child Psychotherapy*. 32: 158–180.

Andrade, V.M. (2005). "Affect and the therapeutic action in psychoanalysis". *Internat. J. Psychoanal*. 86: 677–697.

Barbas, H. (2007). "Flow of information for emotions through temporal and orbitofrontal pathways". *Journal of Anatomy*. 211: 237–249.

Bargh, J.A. and Morsella, E. (2008). "The unconscious mind". *Perspectives on Psychological Science*. 3: 73–79.

Benowitz, L.I., Bear, D.M., Rosenthal, R., Mesulam, M.M., Zaidel, E. and Sperry, R.W. (1983). "Hemispheric specialization in non-verbal communication". *Cortex*. 19: 5–11.

Blonder, L.X., Bowers, D. and Heilman, K.M. (1991). "The role of the right hemisphere in emotional communication". *Brain*, 114: 1,115–1,127.

Bohart, A.C. (1999). "Intuition and creativity in psychotherapy". *J. Constructivist Psychology*. 12: 287–311.

Bolte, A. and Goschke, T. (2005). "On the speed of intuition: Intuitive judgments of semantic coherence under different response deadlines". *Memory & Cognition*. 33: 1,248–1,255.

Boucouvalas, M. (1997). "Intuition: The concept and the experience". In: R.D. Floyd and P.S. Arvidson (eds). *Intuition: The inside story*. New York: Routledge, pp. 39–56.

Bowlby, J. (autumn 1991). The role of the psychotherapist's personal resources in the therapeutic situation. In: *Tavistock Gazette*.

Bromberg, P.M. (2006). *Awakening the dreamer: Clinical journeys*. Mahweh, NJ: The Analytic Press.

Buchanan, T.W., Tranel, D. and Adolphs, R. (2006). "Memories for emotional autobiographical events following unilateral damage to medial temporal lobe". *Brain*. 129: 115–127.

Bugental, J.F. (1987). *The Art of the psychotherapist*. New York: W.W. Norton.

Buklina, S.B. (2005). "The corpus callosum, interhemispheric interactions, and the function of the right hemisphere of the brain". *Neuroscience and Behavioral Physiology*. 35: 473–480.

Burgoon, J.K. (1985). "Non-verbal signals". In: M.L. Knapp, and C.R. Miller (eds) *Handbook of interpersonal communication*. Beverly Hills CA: Sager Publications, pp. 344–390.

Carretie, L., Hinojosa, J.A., Mercado, F. and Tapia, M. (2005). "Cortical response to subjectively unconscious danger". *NeuroImage*. 24: 615–623.

Chused, J.F. (2007). "Non-verbal communication in psychoanalysis: commentary on Harrison and Tronick". *J. Amer. Psychoanal. Assn*. 55: 875–882.

Cortina, M. and Liotti, G. (2007). "New approaches to understanding unconscious processes: Implicit and explicit memory systems". *Internat. Forum of Psychoanal*. 16: 204–212.

Davies, J.M. (2004). "Whose bad objects are we anyway? Repetition and our elusive love affair with evil". *Psychoanal. Dial*. 14: 711–732.

Devinsky, O. (2000). "Right cerebral hemispheric dominance for a sense of corporeal and emotional self". *Epilepsy & Behavior*. 1: 60–73.

Dorpat, T.L. (2001). "Primary process communication". *Psychoanal. Inq*. 3: 448–463.

Elliott, R., Dolan, R.J. and Frith, C.D. (2000). "Dissociable functions in the medial and lateral orbitofrontal cortex: evidence from human neuroimaging studies". *Cerebral Cortex*. 10: 308–317.

Ezhov, S.N. and Krivoschekov, S.G. (2004). "Features of psychomotor responses and interhemispheric relationahips at various stages of adaptation to a new time zone". *Human Physiology*. 30: 172–175.

Feldman, M. (1997). "Projective identification: the analyst's involvement". *Int. J. Psychoanal*. 78: 227–241.

Freud, S. (1895). Project for a Scientific Psychology. *Standard Edition*, Vol. 1, 281–397.

——. (1915). The unconscious. *Standard Edition*, Vol. 14, 159–205.

——. (1920/1943). *A general introduction to psycho-analysis*. Garden City New York: Garden City Publishing Company.

Ginot, E. (2007). "Intersubjectivity and neuroscience. Understanding enactments and their therapeutic significance within emerging paradigms". *Psychoanalytic Psychology*. 24: 317–332.

Grabner, R.H., Fink, A. and Neubauer, A.C. (2007). "Brain correlates of self-related originality of ideas: Evidence from event-related power

and phase-locking changes in the EEG". *Behavioral Neuroscience.* 121: 224–230.

Greenberg, L.S. (2007). "Emotion coming of age". *Clinical Psychology Science and Practice.* 14: 414–421.

Happaney, K., Zelazo, P.D. and Stuss, D.T. (2004). "Development of orbitofrontal function: Current themes and future directions". *Brain and Cognition.* 55: 1–10.

Hugdahl, K. (1995). "Classical conditioning and implicit learning: The right hemisphere hypothesis". In: R.J. Davidson, and K. Hugdahl (eds) *Brain asymmetry.* Cambridge, MA: MIT Press, pp. 235–267.

Hutterer, J. and Liss, M. (2006). "Cognitive development, memory, trauma, treatment: An integration of psychoanalytic and behavioural concepts in light of current neuroscience research". *J. Amer. Acad. Psychoanal. Dynamic Psychiatry.* 34: 287–302.

Joseph, R. (1996). *Neuropsychiatry, Neuropsychology, and Clinical Neuroscience.* 2nd ed. Baltimore: Williams & Wilkins.

Kalbe, E., Brand, M., Thiel, A., Kessler, J. and Markowitsch, H.J. (2008). "Neuropsychological and neural correlates of autobiographical deficits in a mother who killed her children". *Neurocase.* 14: 15–28.

LeDoux, J. (2002). *Synaptic self: How our brains become who we are.* New York: Viking.

Lichtenberg, J.D., Lachmann, F.M. and Fosshage, J.L. (1996). *The clinical exchange.* Mahwah, NJ: The Analytic Press.

Lieberman, M.D. (2000). "Intuition: a social neuroscience approach". *Psychological Bulletin.* 126: 109–137.

Lyons-Ruth, K. (2000). "'I sense that you sense that I sense ...': Sander's recognition process and the emergence of new forms of relational organization". *Infant Mental Health J.* 21: 85–98.

——. (2005) "The two-person unconscious: Intersubjective dialogue, enactive representation, and the emergence of new forms of relational organization". In: L. Aron and A. Harris (eds) *Relational psychoanalysis,* Vol. II. Hillsdale, NJ: The Analytic Press, pp. 2–45.

Mancia, M. (2006). "Implicit memory and early unrepressed unconscious: Their role in the therapeutic process (How the neurosciences can contribute to psychoanalysis)". *Int. J. Psychoanal.* 87: 83–103.

Marcus D.M. (1997). "On knowing what one knows". *Psychoanal. Q.* 66: 219–241.

Markowitsch, H.J., Reinkemeier, A., Kessler, J., Koyuncu, A. and Heiss, W.D. (2000). "Right amygdalar and temperofrontal activation during autobiographical, but not fictitious memory retrieval". *Behavioral Neurology.* 12: 181–190.

Mashal, N., Faust, M., Hendler, T. and Jung-Beeman, M. (2007). "An fMRI investigation of the neural correates underlying the

processing of novel metaphoric expressions". *Brain and Language.* 100: 115–126.

McLaughlin, J.T. (1991). "Clinical and theoretical aspects of enactment". *J. Amer. Psychoanal. Assn.* 39: 595–614.

Mohaupt, H., Holgersen, H., Binder, P.E. and Nielsen, G.H. (2006). "Affect consciousness or mentalization? A comparison of two concepts with regard to affecr development and affect regulation". *Scandinavian J. Psychology.* 47: 237–244.

Morris, J.S., Ohman, A. and Dolan, R.J. (1998). "Conscious and unconscious emotional learning in the human amygdala". *Nature.* 393: 467–470.

Naito, E., Roland, P.E. Grefkes, C., Choi, H.J., Eickhoff, S., Geyer, S., Zilles, K. and Ehrsson, H.H. (2005). "Dominance of the right hemisphere and role of Area 2 in human kinesthesia". *J. Neurophysiology.* 93: 1,020–1,034.

Ogden, P., Pain, C., Minton, K. and Fisher, J. (2005). "Including the body in mainstream psychotherapy for traumatized individuals". *Psychologist-Psychoanalyst*, XXV, No. 4. 19–24.

Orlinsky, D.E. and Howard, K.I. (1986). "Process and outcome in psychotherapy". In: S.L. Garfield, and A.E. Bergin (eds) *Handbook of psychotherapy and behavior change*, 3rd Edn. New York: Wiley.

Pincus, D., Freeman, W. and Modell, A. (2007). "A neurobiological model of perception. Considerations for transference". *Psychoanal. Psychol.* 24: 623–640.

Plakun, E.M. (1999). "Making the alliance and taking the transference in work with suicidal patients". *J. Psychotherapy Practice and Research.* 10f: 269–276.

Podell, K., Iovell, M. and Goldberg, E. (2001). "Lateralization of frontal lobe functions". In: S.P. Salloway, P.F. Malloy, and J.D. Duffy (eds) *The frontal lobes and neuropsychiatric illness.* London: American Psychiatric Publishing, pp. 83–89.

Raz, A. (2004). "Anatomy of attentional networks". *Anatomical Records.* 281B: 21–36.

Renik, O. (1993). "Countertransference enactment and the psychoanalytic process". In: M.J. Horowitz, O.F. Kernberg, and E.M. Weinshel (eds) *Psychic structure and psychic change: Essays in honor of Robert S. Wallerstein.* Madison CT: International Universities Press, pp. 135–158.

Rosenblatt, A.D. and Thickstun, J.T. (1994). "Intuition and consciousness". *Psychoanal. Q.* 63: 696–714.

Rule, R.R. Shimamura, A.P. and Knight, R.T. (2002). "Orbitofrontal cortex and dynamic filtering of emotional stimuli. Cognition, Affective, & Behavioral". *Neuroscience.* 2: 264–270.

Ryan, R. (2007). "Motivation and emotion: A new look and approach for two reemerging fields". *Motivation and Emotion*. 31. 1–3.

Sato, W. and Aoki, S. (2006). "Right hemisphere dominance in processing unconscious emotion". *Brain and Cognition*. 62: 261–266.

Schooler, J. and Melcher, J. (1995). The ineffability of insight. In: S.T. Smith, T.B. Ward, and R.A. Finke (eds) *The creative cognition approach*. Cambridge, MA: MIT Press, pp. 27–51.

Schore, A.N. (1994). *Affect regulation and the origin of the self*. Mahweh NJ: Erlbaum.

——. (1997). "A century after Freud's Project: Is a rapprochement between psychoanalysis and neurobiology at hand?" *J. Amer. Psychoanal. Assn*. 45: 841–867.

——. (2002). "The right brain as the neurobiological substratum of Freud's .dynamic unconscious". In: D. Scharff (ed.) *The psychoanalytic century: Freud's legacy for the future*. New York: Other Press, pp. 61–88.

——. (2003a). *Affect regulation and the repair of the self*. New York: W.W. Norton.

——. (2003b). *Affect dysregulation and disorders of the self*. New York: W.W. Norton.

——. (2005). "A neuropsychoanalytic viewpoint. Commentary on paper by Steven H. Knoblauch". *Psychoanal. Dial*. 15: 829–854.

——. (2007). "Review of Awakening the dreamer: clinical journeys by Philip M. Bromberg". *Psychoanal. Dial*. 17: 753–767.

——. (2009a). "Attachment trauma and the developing right brain: Origins of pathological dissociation". In: P.F. Dell, and J.A. O'Neil (eds) *Dissociation and the dissociative disorders: DSM-V and Beyond*. New York: Routledge, pp. 107–141.

——. (2009b). "Relational trauma and the developing right brain: an interface of psychoanalytic self psychology and neuroscience". *Annals of the New York Academy of Sciences*. 1159: 189–203.

——. (2009c). "Right brain affect regulation: an essential mechanism of development, trauma, dissociation, and psychotherapy". In: D. Fosha, M. Solomon, and D. Siegel (eds) *The hearing power of emotion: Integrating relationships, body and mind. A dialogue among scientists and clinicians*. New York: Norton, pp. 112–144.

——. (in press). "Relational trauma and the developing right brain: the neurobiology of broken attachment bonds". In: T. Baradon (ed.) *Relational trauma in infancy*. London: Routledge.

Schore, J.R. and Schore, A.N. (2008). "Modern attachment theory: the central role of affect regulation in development and treatment". *Clinical Social Work Journal*. 36: 9–20.

Schutz, L.E. (2005). "Broad-perspective perceptual disorder of the right hemisphere". *Neuropsychology Review*. 15: 11–27.

Soanes, C. and Hawker S. (2005). *Compact Oxford Dictionary of Current English*. Oxford: Oxford University Press.

Spiegel, D. and Cardena, E. (1991). "Disintegrated experience: the dissociative disorders revisited". *Journal of Abnormal Psychology*. 100: 366–378.

Stern, D.N. (1998). Bruschweiler-Stern, N., Harrison, A.M., Lyons-Ruth, K., Morgan, A.C., Nahum, J.P., Sander, L. and Tronick, E.Z. "The process of therapeutic change involving implicit knowledge: Some implications of developmental observations for adult psychotherapy". *Infant Mental Health J.* 19: 300–308.

——. (2004). *The Present moment in psychotherapy and everyday life*. New York: WW Norton.

——. (2005). "Intersubjectivity". In: E.S. Person, A.M. Cooper, and G.O. Gabbard (eds) *Textbook of psychoanalysis*. Washington, DC: American Psychiatric Publishing, pp. 77–92.

Sullivan, R.M., and Dufresne, M.M. (2006). "Mesocortical dopamine and HPA axis regulation: Role of laterality and early environment". *Brain Research. 1076*: 49–59.

Uddin, L.Q., Molnar-Szakacs, I., Zaidel, E. and Iacoboni, M. (2006). "rTMS to the right inferior parietal lobule disrupts self-other discrimination". *Social Cognitive and Affective Neuroscience*. 1: 65–71.

van Lancker, D. and Cummings, J.L. (1999). "Expletives: neurolingusitic and neurobehavioral perspectives on swearing". *Brain Research Reviews*. 31: 83–104.

Volz, K.G. and von Cramon, D.Y. (2006). "What neuroscience can tell about intuitive processes in the context of perceptual discovery". *J. Cognitive Neurosci*. 18: 2,077–2,087.

Welling, H. (2005). "The intuitive process: the case of psychotherapy". *J. Psychotherapy Integration*. 15: 19–47.

Zanocco, G., De Marchi, A. and Pozzi, F. (2006). "Sensory empathy and enactment". *Int. J. Psychoanal*. 87: 145–158.

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