

# The Right Brain Is Dominant in Psychotherapy

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This article discusses how recent studies of the right brain, which is dominant for the implicit, nonverbal, intuitive, holistic processing of emotional information and social interactions, can elucidate the neurobiological mechanisms that underlie the relational foundations of psychotherapy. Utilizing the interpersonal neurobiological perspective of regulation theory, I describe the fundamental role of the early developing right brain in relational processes, throughout the life span. I present interdisciplinary evidence documenting right brain functions in early attachment processes, in emotional communications within the therapeutic alliance, in mutual therapeutic enactments, and in therapeutic change processes. This work highlights the fact that the current emphasis on relational processes is shared by, cross-fertilizing, and indeed transforming both psychology and neuroscience, with important consequences for clinical psychological models of psychotherapeutic change.

*Keywords:* affect regulation, attachment, right brain

In 2009, the American Psychological Association invited me to offer a plenary address, “The Paradigm Shift: The Right Brain and the Relational Unconscious.” In fact, that was one of the first times an APA plenary address was given by a member in independent practice, and by a clinician who was also psychoanalytically informed. Citing 15 years of my interdisciplinary research, I argued that a paradigm shift was occurring not only within psychology but also across disciplines, and that psychology now needed to enter into a more intense dialogue with its neighboring biological and medical sciences. I emphasized the relevance of developmental and affective neuroscience (more so than cognitive neuroscience) for clinical and abnormal psychology. And so I reported that both clinicians and researchers were now shifting focus from left brain explicit conscious cognition to right brain implicit unconscious emotional and relational functions (Schore, 2009). Only a few years before, the APA explicitly articulated its new found emphasis on the relational foundations of psychotherapy. In 2006, APA Presidential Task Force on Evidence-Based Practice boldly stated—

Central to clinical expertise is interpersonal skill, which is manifested in forming a therapeutic relationship, encoding and decoding verbal and nonverbal responses, creating realistic but positive expectations, and responding empathically to the patient’s explicit and implicit experiences and concerns. (p. 277)

This relational trend in psychotherapy had largely evolved from seminal contributions of psychodynamic clinicians, including Sullivan (1953), Kohut (1971), Mitchell (1988), and more recently, Bromberg (2011).

Over this same time, in parallel to psychological advances in psychotherapy, the paradigm shift to a relational “two-person psychology” had also progressed within neuroscience, especially in the discipline of interpersonal neurobiology. In this article, I briefly summarize my work in that field, utilizing the relational perspective of regulation theory (Schore, 1994, 2003a,b, 2012) to model the development, psychopathogenesis, and treatment of the implicit subjective self. This interdisciplinary work integrates psychology and biology to more deeply understand precisely how relational experiences, for better or worse, impact the early development of psychic structure and the emergent subjective self, and how these structures are expressed at all later stages of the life span, especially in psychotherapeutic contexts. My studies continue to describe the fundamental role of the early developing right brain in relational processes. In the following, I present interpersonal neurobiological models of attachment in early development, in the therapeutic alliance, in mutual therapeutic enactments, and in the therapeutic change processes. This work highlights the fact that the current emphasis on relational processes is shared by, cross-fertilizing, and indeed transforming both psychology and neuroscience, with important consequences for clinical psychological models of psychotherapeutic change.

A major purpose of regulation theory is to construct more complex theoretical models that can generate both heuristic experimental research and clinically relevant formulations of human social–emotional development. My studies in attachment neurobiology indicate that mother–infant relational communications operate rapidly, beneath levels of conscious awareness, while my research in developmental neuropsychology describes the early evolution of a “relational unconscious” and a right lateralized “social brain” that represents the biological substrate of the human unconscious. A large body of brain laterality studies now confirms the principle that “The left side is involved with conscious response and the right with the unconscious mind” (Mlot, 1998, p. 1006). Regulation theory thus strongly supports currently evolving psychodynamic models of psychotherapy, especially in the treatment of early forming attachment trauma. (Throughout, for the

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purposes of this article, the term “psychodynamic” can be equated with “psychoanalytic,” and “psychotherapist” with “analyst”).

### Interpersonal Neurobiology of Attachment: Interactive Regulation and the Maturation of the Right Brain

A major contributor to the current relational trend derives from recent advances in attachment theory, now the most influential theory of early social–emotional development available to science. Following John Bowlby’s (1969) seminal contributions, over the past two decades, I have utilized an interdisciplinary relational perspective to describe and integrate the developmental psychological and biological processes that underlie the formation of an attachment bond of emotional communication between the infant and primary caregiver (Schore, 1994, 2003a,b, 2012). The organizing principle of this work dictates that “the self-organization of the developing brain occurs in the context of a relationship with another self, another brain” (Schore, 1996, p. 60). At the core of the model is the relational, interactive regulation of affects, which in turn impacts and shapes the maturation of the early developing right brain.

Modern attachment theory (J. Schore & A. Schore, 2008) is essentially a theory of the development of affect regulation, and thus emotional development. During attachment episodes of right-lateralized visual–facial, auditory–prosodic, and tactile–gestural nonverbal communications, the primary caregiver regulates the infant’s burgeoning positive and negative bodily based affective states. The theory posits that the hard wiring of the infant’s developing right brain, which is dominant for the emotional sense of self, is influenced by implicit (nonconscious), right brain-to-right brain affect communicating and regulating transactions with the mother. In this manner, the evolutionary mechanism of early attachment bonding is central to all later aspects of human development, especially adaptive right brain social–emotional functions essential for survival (Schore, 1994, 2003a,b, 2012).

At the most fundamental level, the right brain attachment mechanism is expressed as interactive regulation of affective–autonomic arousal, and thereby the interpersonal regulation of biological synchronicity between and within organisms. During dyadic attachment transactions, the sensitive primary caregiver implicitly attends to, perceives (recognizes), appraises, and regulates nonverbal expressions of the infant’s more and more intense states of positive and negative affective arousal. Via these communications, the mother regulates the infant’s postnatally developing central and autonomic nervous systems. In this cocreated dialogue, the “good enough” mother and her infant coconstruct multiple cycles of both “affect synchrony” that up-regulates positive affect (e.g., joy–elation, interest–excitement) and “rupture and repair” that down-regulates negative affect (e.g., fear–terror, sadness–depression, shame). Internal representations of attachment experiences are imprinted in right-lateralized implicit–procedural memory as an internal working model that encodes nonconscious strategies of affect regulation.

Emotional states are initially regulated by others, but over the course of infancy it increasingly becomes self-regulated as a result of neurophysiological development and actual lived experience. These adaptive capacities are central to the emergence of self-regulation, the ability to flexibly regulate an expanding array of

positive and negative affectively charged psychobiological states in different relational contexts, thereby allowing for the assimilation of various adaptive emotional–motivational states into a dynamic, coherent, and integrated self-system. Optimal attachment experiences that engender a secure attachment with the primary caregiver thus facilitate both types of self-regulation: interactive regulation of emotions accessed while subjectively engaged with other humans in interconnected contexts, and autoregulation of emotions activated while subjectively disengaged from other humans in autonomous contexts. Regulation theory defines emotional well-being as nonconscious yet efficient and resilient switching between these two modes (interconnectedness and autonomy), depending on the relational context. Internal working models of attachment encode both of these modes of coping strategies of affect regulation. Recall Bowlby (1969) asserted that these internal representations of attachment operate at levels beneath conscious awareness.

As the securely attached infant enters toddlerhood, his or her interactively regulated right brain visual–facial, auditory–prosodic, and tactile–gestural attachment experiences become more holistically integrated, allowing for the emergence of a coherent implicit (unconscious) emotional and corporeal sense of self (Schore, 1994). Developmental neurobiological research supports the hypothesis that the attachment mechanism is embedded in infant–caregiver right brain-to-right brain affective transactions. Neuroscientific studies with adults now clearly indicate that right (and not left) lateralized prefrontal systems are responsible for the highest level regulation of affect and stress in the brain (see Schore, 2013; Schore, 2012 for references). They also document that in adulthood the right hemisphere continues to be dominant for affiliation, while the left supports power motivation (Kuhl & Kazen, 2008; Quirin et al., 2013).

Furthermore, my work in developmental neuropsychanalysis models the early development of the unconscious (vs. the later forming conscious) mind. These studies echo a basic premise of classical developmental psychoanalysis, that the first relational contact is between the unconscious of the mother and the unconscious of the infant (Palombo, Bendicssen, & Koch, 2009; J. Schore, 2012). Throughout the life span, implicit psychobiological regulation, operating at nonconscious levels, supports the survival functions of the right brain, the biological substrate of the human unconscious (Joseph, 1992; Schore, 1994, 2003b, 2012). Consonant with this proposal Tucker and Moller assert, “The right hemisphere’s specialization for emotional communication through nonverbal channels seems to suggest a domain of the mind that is close to the motivationally charged psychoanalytic unconscious” (2007, p. 91). Indeed, a growing body of studies document that unconscious processing of emotional information is mainly subsumed by a right hemisphere subcortical route (Gainotti, 2012), that unconscious emotional memories are stored in the right hemisphere (Gainotti 2006), and that this hemisphere is centrally involved in maintaining a coherent, continuous, and unified sense of self (Devinsky, 2000; McGilchrist, 2009). From infancy throughout all later stages of the life span, right-lateralized spontaneous, rapidly acting emotional processes are centrally involved in enabling the organism to cope with stresses and challenges, and thus in emotional resilience and well-being.

### Right Brain Attachment Communications Within the Therapeutic Alliance

Regulation theory dictates that early social–emotional experiences may be either predominantly regulated or dysregulated, imprinting secure or insecure attachments. Developmental neuroscience now clearly demonstrates that all children are not “resilient” but “malleable,” for better or worse (Schore, 2012). In marked contrast to the earlier described optimal growth-facilitating attachment scenario, in a relational growth-inhibiting early environment of attachment trauma (abuse and/or neglect), the primary caregiver of an insecure disorganized–disoriented infant induces traumatic states of enduring negative affect in the child (Schore, 2001, 2003a). This caregiver is too frequently emotionally inaccessible and reacts to her infant’s expressions of stressful affects inconsistently and inappropriately (massive intrusiveness or massive disengagement), and therefore shows minimal or unpredictable participation in the relational arousal-regulating processes. Instead of modulating she induces extreme levels of stressful stimulation and arousal, very high in abuse and/or very low in neglect. Because she provides little interactive repair, the infant’s intense negative affective states are long lasting.

A large body of research now highlights the central role of insecure attachments in the psychoneuropathogenesis of all psychiatric disorders (Schore, 1996, 2003a, 2012, 2013). Watt (2003) observes, “If children grow up with dominant experiences of separation, distress, fear, and rage, then they will go down a bad pathogenic developmental pathway, and it’s not just a bad psychological pathway but a bad neurological pathway” (p. 109). More specifically, during early critical periods, frequent dysregulated and unrepaired organized and disorganized–disoriented insecure attachment histories are “affectively burnt in” the infant’s early developing right brain. Not only traumatic experiences but also the defense against overwhelming trauma, dissociation, is stored in implicit–procedural memory. In this manner, attachment trauma (“relational trauma,” Schore, 2001) is imprinted into right cortical–subcortical systems, encoding disorganized–disoriented insecure internal working models that are nonconsciously accessed at later points of interpersonal emotional stress. These insecure working models are a central focus of affectively focused psychotherapy of early forming self-pathologies and personality disorders. There is now consensus that deficits in right brain relational processes and resulting affect dysregulation underlie all psychological and psychiatric disorders. All models of therapeutic intervention across a span of psychopathologies share a common goal of attempting to improve emotional self-regulatory processes. Neurobiologically informed relational infant, child, adolescent, and adult psychotherapy can thus potentially facilitate the intrinsic plasticity of the right brain.

Recall, Bowlby (1988), a psychoanalyst, asserted that the reassessment of *nonconscious* internal working models of attachment is a primary goal of any psychotherapy. These interactive representations of early attachment experiences encode strategies of affect regulation, and contain coping mechanisms for maintaining basic regulation and positive affect in the face of stressful environmental challenge. Acting at levels beneath conscious awareness, this internal working model is accessed to perceive, appraise, and regulate social–emotional information and guide action in familiar and especially novel interpersonal environments. Regula-

tion theory dictates that in “heightened affective moments” (Schore, 2003b), the patient’s unconscious internal working model of attachment, whether secure or insecure, is reactivated in right-lateralized implicit–procedural memory and reenacted in the psychotherapeutic relationship.

In light of the commonality of nonverbal, intersubjective, implicit right brain-to-right brain emotion transacting and regulating mechanisms in the caregiver–infant and the therapist–patient relationship, developmental attachment studies have direct relevance to the treatment process. From the first point of intersubjective contact, the psychobiologically attuned clinician tracks not just the verbal content but the nonverbal moment-to-moment rhythmic structures of the patient’s internal states, and is flexibly and fluidly modifying his or her own behavior to synchronize with that structure, thereby cocreating with the patient a growth-facilitating context for the organization of the therapeutic alliance. Decety and Chaminade’s (2003) characterization of higher functions of the right brain is directly applicable to the psychotherapeutic relational context: “Mental states that are in essence private to the self may be shared between individuals . . . self-awareness, empathy, identification with others, and more generally intersubjective processes, (and) are largely dependent upon . . . right hemisphere resources, which are the first to develop” (p. 591). As the right hemisphere is dominant for subjective emotional experiences (Wittling & Roschmann, 1993), the communication of affective states between the right brains of the patient–therapist dyad is thus best described as “intersubjectivity.”

In accord with a relational model of psychotherapy, right brain processes that are reciprocally activated on both sides of the therapeutic alliance lie at the core of the psychotherapeutic change process. These implicit clinical dialogues convey much more essential organismic information than left brain explicit, verbal information. Rather, right brain interactions “beneath the words” nonverbally communicate essential nonconscious bodily based affective relational information about the inner world of the patient (and therapist). Rapid communications between the right-lateralized “emotional brain” of each member of the therapeutic alliance allow for moment-to-moment “self-state sharing,” a co-created, organized, dynamically changing dialogue of mutual influence. Bromberg (2011) notes, “Self-states are highly individualized modules of being, each configured by its own organization of cognitions, beliefs, dominant affect, and mood, access to memory, skills, behaviors, values, action, and regulatory physiology (p. 73).” In this relational matrix, both partners match the dynamic contours of different emotional–motivational self-states, and simultaneously adjust their social attention, stimulation, and accelerating/decelerating arousal in response to the partner’s signals.

Regulation theory models the mutual psychobiological mechanisms that underlie any clinical encounter, whatever the verbal content. Lyons-Ruth (2000) characterizes the affective exchanges that communicate “implicit relational knowledge” within the therapeutic alliance. She observes that most relational transactions rely on a substrate of affective cues that give an evaluative valence or direction to each relational communication. These occur at an implicit level of cueing and response that occurs too rapidly for verbal transaction and conscious reflection. In the clinical literature, Scaer (2005) describes essential implicit communication patterns embedded within the therapist–client relationship:

Many features of social interaction are nonverbal, consisting of subtle variations of facial expression that set the tone for the content of the interaction. Body postures and movement patterns of the therapist . . . also may reflect emotions such as disapproval, support, humor, and fear. Tone and volume of voice, patterns and speed of verbal communication, and eye contact also contain elements of subliminal communication and contribute to the unconscious establishment of a safe, healing environment. (p. 167–168)

These implicit right brain/mind/body nonverbal communications are bidirectional and intersubjective, and thereby potentially valuable to the clinician. [Meares \(2005\)](#) observes—

Not only is the therapist being unconsciously influenced by a series of slight and, in some cases, subliminal signals, so also is the patient. Details of the therapist's posture, gaze, tone of voice, even respiration, are recorded and processed. A sophisticated therapist may use this processing in a beneficial way, potentiating a change in the patient's state without, or in addition to, the use of words. (p. 124)

Neuroscience characterizes the role of the right brain in these nonverbal communications. At all stages of the life span, “The neural substrates of the perception of voices, faces, gestures, smells and pheromones, as evidenced by modern neuroimaging techniques, are characterized by a general pattern of right-hemispheric functional asymmetry” ([Brancucci, Lucci, Mazzatenta, & Tommasi, 2009](#), p. 895). More so than conscious left brain verbalizations, right brain-to-right brain visual–facial, auditory–prosodic, and tactile–gestural subliminal communications reveal the deeper aspects of the personality of the patient, as well as the personality of the therapist (see [Schore, 2003b](#) for a right brain-to-right brain model of projective identification, a fundamental process of implicit communication between the relational unconscious systems of patient and therapist).

To receive and monitor the patient's nonverbal bodily based attachment communications, the affectively attuned clinicians must shift from constricted left hemispheric attention that focuses on local detail to more widely expanded right hemispheric attention that focuses on global detail ([Derryberry & Tucker, 1994](#)), a characterization that fits with [Freud's \(1912\)](#) description of the importance of the clinician's “evenly suspended attention.” In the session, the empathic therapist is consciously, explicitly attending to the patient's verbalizations to objectively diagnose and rationalize the patient's dysregulating symptomatology. However, she is also listening and interacting at another level, an experience-near subjective level, one that implicitly processes moment-to-moment attachment communications and self-states at levels beneath awareness. [Bucci \(2002\)](#) observes, “We recognize changes in emotional states of others based on perception of subtle shifts in their facial expression or posture, and recognize changes in our own states based on somatic or kinesthetic experience” (p. 194).

Writing on therapeutic “nonverbal implicit communications” [Chused \(2007\)](#) asserts, “It is not that the information they contain cannot be verbalized, only that sometimes only a nonverbal 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 nonverbal communications are examples of “primary process communication.” According to [Dorpat \(2001\)](#), “The primary process system analyzes, regulates, and communicates an individual's relations with the environment” (p. 449). He observes, “Affective and object-relational information

is transmitted predominantly by primary process communication. Nonverbal communication includes body movements (kinesics), posture, gesture, facial expression, voice inflection, and the sequence, rhythm, and pitch of the spoken words” (p. 451). The right brain thus processes “the music behind the words.”

The organizing principle of working with unconscious primary process communications dictates that just as the left brain communicates its states to other left brains via conscious linguistic behaviors, so the right nonverbally communicates its other states to other right brains that are tuned to receive these communications. [Bromberg \(2011\)](#) concludes, “Allan Schore writes about a right brain-to-right brain channel of affective communication—a channel that he sees as ‘an organized dialogue’ comprised of ‘dynamically fluctuating moment-to-moment state sharing.’ I believe it to be this process of state sharing that . . . allows . . . ‘a good psychoanalytic match’” (p. 169). Writing in the psychiatry literature, [Meares \(2012\)](#) describes “a form of therapeutic conversation that can be conceived . . . as a dynamic interplay between two right hemispheres” (for other clinical examples of right brain-to-right brain tracking see [Chapman, 2014](#); [Marks-Tarlow, 2012](#); [Montgomery, 2013](#); [Schore, 2012](#)).

On the matter of the verbal content, the words in psychotherapy—it has long been assumed in the psychotherapeutic literature that all forms of language reflect left hemispheric functioning of the conscious mind. Current neuroscience now indicates this is incorrect. In an overarching review [Ross and Monnot](#) conclude, “Thus, the traditional concept that language is a dominant and lateralized function of the left hemisphere is no longer tenable.” (2008, p. 51).

Over the last three decades, there has been growing realization that the right hemisphere is essential for language and communication competency and psychological well-being through its ability to modulate affective prosody and gestural behavior, decode connotative (nonstandard) word meanings, make thematic inferences, and process metaphor, complex linguistic relationships and nonliteral (idiomatic) types of expressions. (p. 51)

Other studies reveal that the right hemisphere is dominant for the processing of specifically, emotional words ([Kuchinke et al., 2006](#)), especially attachment words associated with positive interpersonal relationships ([Mohr, Rowe, & Crawford, 2008](#)). These data suggest that the early responding right brain, which is more “physiological” than the later responding left, is involved in rapid bodily based intersubjective communications within the therapeutic alliance.

Intersubjectivity is more than a communication or match of explicit verbal cognitions or overt behaviors. Regulated and dysregulated bodily based affects are communicated within an energy-transmitting intersubjective field coconstructed by two individuals that includes not just two minds but two bodies ([Schore, 2012](#)). At the psychobiological core of the coconstructed intersubjective field is the attachment bond of emotional communication and interactive regulation. Implicit intersubjective communications express bodily based emotional self-states, not just conscious cognitive “mental” states. The essential biological function of attachment communications in all human interactions, including those embedded in the therapeutic alliance, is the regulation of right brain/mind/body states. Intersubjective, relational, affect-focused psy-

chotherapy is not the “talking cure,” but the “affect communicating cure.”

### Transference–Countertransference Communications Within Mutual Enactments

Regulation theory’s relational perspective allows for a deeper understanding of the critical intersubjective brain/mind/body mechanisms that operate at implicit levels of the therapeutic alliance, beneath the exchanges of language and explicit cognitions. One such essential mechanism is the bidirectional transference–countertransference relationship. There is now a growing consensus that despite the existence of a number of distinct theoretical perspectives in clinical work, Freud’s concepts of transference and countertransference, have now been expanded and (re-) incorporated into all forms of psychotherapy. Transference–countertransference affective transactions are currently seen as an essential relational element in the treatment of all patients, but especially the early forming severe psychopathologies.

In such cases implicit right brain-to-right brain nonverbal communications (facial expressions, prosody–tone of voice, gesture) convey unconscious transference–countertransference affective transactions, which revive earlier attachment memories, especially of intensely dysregulated affective states. Gainotti (2006) observes, “the right hemisphere may be crucially involved in those emotional memories which must be reactivated and reworked during the psychoanalytical treatment” (p. 167). In discussing the role of the right hemisphere as “the seat of implicit memory,” Mancina (2006) notes: “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). Transference has been described as an expression of the patient’s implicit memories. These memories are expressed in “heightened affective moments” as transferential right brain-to-right brain nonverbal communications of fast acting, automatic, dysregulated bodily based states of intensely stressful emotional arousal (e.g., fear–terror, aggression–rage, depression–hopeless despair, shame, disgust). Right-lateralized implicit–procedural emotional memory also encodes the dissociative defense against reexperiencing relational trauma and thereby generates dissociated (unconscious) affects.

Recent psychodynamic models of transference now contend, “no appreciation of transference can do without emotion” (Pincus, Freeman, & Model, 2007, p. 634). Clinical theoreticians describe transference as “an established pattern of relating and emotional responding that is cued by something in the present, but oftentimes calls up both an affective state and thoughts that may have more to do with past experience than present ones” (Maroda, 2005, p. 134). This conception is echoed in neuroscience, where Shuren and Grafman (2002) assert, “The right hemisphere holds representations of the emotional states associated with events experienced by the individual. When that individual encounters a familiar scenario, representations of past emotional experiences are retrieved by the right hemisphere and are incorporated into the reasoning process.” (p. 918). Research now indicates that the right hemisphere is fundamentally involved in autobiographical memory (Markowitsch, Reinkemeier, Kessler, Koyuncu, & Heiss, 2000).

Recall Racker’s (1968) classical dictum, “Every transference situation provokes a countertransference situation.” Translating this into modern neuropsychanalytic terms, transference–countertransference transactions are expressions of bidirectional nonconscious, nonverbal right brain–mind–body stressful communications between patient and therapist. These reciprocal psychoneurobiological exchanges reflect activities of both the central and autonomic nervous systems. Behaviorally, the patient’s transferential communications are expressed in nonverbal, visual, auditory, and gestural affective cues that are spontaneously and quickly expressed from the face, voice, and body of the patient. Countertransference is similarly defined in nonverbal implicit terms as the therapist’s autonomic responses that are reactions on an unconscious level to nonverbal messages. In my first book, I stated—

Countertransference processes are currently understood to be manifest in the capacity to recognize and utilize the sensory (visual, auditory, tactile, kinesthetic, and olfactory) and affective qualities of imagery which the patient generates in the psychotherapist . . . countertransference dynamics are appraised by the therapist’s observations of his own visceral reactions to the patient’s material. (1994, p. 451).

As the empathic clinician implicitly monitors the patient’s nonverbal transferential communications, her psychobiologically attuned right brain, which is dominant for emotional arousal (MacNeilage, Rogers, & Vallortigara, 2005), tracks, at a preconscious level, the patterns of arousal rhythms and flows of the patient’s affective states. Clinicians are now asserting “transference is distinctive in that it depends on early patterns of emotional attachment with caregivers” (Pincus et al., 2007, p. 636) and describing the clinical importance of “making conscious the organizing patterns of affect.” (Mohaupt, Holgersen, Binder, & Nielsen, 2006, p. 243). Converging evidence from neuroscience now indicates, “Simply stated, the left hemisphere specializes in analyzing sequences, while the right hemisphere gives evidence of superiority in processing patterns” (van Lancker & Cummings, 1999, p. 95). Even more specifically, “Pattern recognition and comprehension of several types of stimuli, such as faces, chords, complex pitch, graphic images, and voices, has been described as superior in the normal right hemisphere” (van Lancker Sidtis, 2006, p. 233).

But in addition, the therapist is implicitly tracking her own countertransference responses to the patient’s transferential communications, patterns of her own somatic countertransference, interoceptive, bodily based affective responses to the patient’s right brain implicit facial, prosodic, and gestural communications. Via these right brain mechanisms, the intuitive psychobiologically attuned therapist, on a moment-to-moment basis, nonconsciously focuses her right brain countertransference broad attentional processes (Derryberry & Tucker, 1994) on patterns of rhythmic crescendos/decrescendos of the patient’s regulated and dysregulated states of affective autonomic arousal. Freud’s dictum, “It is a very remarkable thing that the *Ucs* of one human being can react upon that of another, without passing through the *Cs*” (1915, p. 194) is thus neuropsychanalytically understood as a right brain-to-right brain communication from one relational unconscious to another. In this manner, “The right hemisphere, in fact, truly interprets the mental state not only of its own brain, but the brains (and minds) of others” (Keenan, Rubio, Racioppi, Johnson, & Barnacz, 2005, p. 702).

Right brain-to-right brain transferential-countertransferential unconscious communications between the patient's and therapist's "internal worlds" represent an essential relational matrix for the therapeutic expression of dissociated affects associated with early attachment trauma and thereby "subjectively unconscious danger" (Carretié, Hinojosa, Mercado, & Tapia, 2005) and "unconscious emotion" (Sato & Aoki, 2006). These affective communications of traumatized self states were neither intersubjectively shared nor interactively regulated by the original attachment object in the historical context, but now the patient has the possibility of a reparative relational experience. According to Borgogno and Vigna-Taglianti (2008),

In patients whose psychic suffering originates in . . . preverbal trauma . . . transference occurs mostly at a more primitive level of expression that involves in an unconscious way . . . not only the patient but also the analyst . . . These more archaic forms of the transference-countertransference issue—which frequently set aside verbal contents—take shape in the analytical setting through actual mutual enactments. (p. 314).

Right brain bodily based dialogues between the relational unconscious of the patient and the relational unconscious of the affectively sensitive empathic therapist are activated and enhanced in the "heightened affective moments" of reenactments of early relational trauma. Enactments are now seen as powerful manifestations of the intersubjective process and expressions of complex, though largely unconscious, self-states and relational patterns (see Schore, 2012 for an extensive interpersonal neurobiological model of working in clinical enactments).

The relational mechanism of mutual enactments represents an interaction between the patient's emotional vulnerability and the clinician's emotional availability (the ability to "take" the transference). It is most fully operational during (inevitable) ruptures of the therapeutic alliance, described by Aspland, Llewelyn, Hardy, Barkham, & Stiles (2008) as "points of emotional disconnections between client and therapist that create a negative shift in the quality of the alliance" (p. 699), that act as "episodes of covert or overt behavior that trap both participants in negative complementary interactions" (p. 700). Although such ruptures of the alliance are the most stressful moments of the treatment, these "collisions" of the therapist's and patient's subjectivities also represent an intersubjective context of potential "collaboration" between their subjectivities, and thereby a context of interactive repair, a fundamental mechanism of therapeutic change. This cocreated emergent relational structure within the therapeutic alliance contains a more efficient feedback communication system of not only right brain communications but also right brain interactive regulations of intensely dysregulated affective states associated with early relational trauma.

Indeed, the essential biological homeostatic functions of affective, bodily based, intersubjective attachment communications in all human interactions, including those embedded in the psychobiological core of the therapeutic alliance, are involved in the regulation of right brain/mind/body states. Aron observes, "Patient and analyst mutually regulate each other's behaviors, enactments, and states of consciousness such that each gets under the other's skin, each reaches into the other's guts, each is breathed in and absorbed by the other . . . the analyst must be attuned to the nonverbal, the affective . . . to his or her bodily responses" (Aron,

1998, p. 26). The importance of this right limbic-autonomic connection is stressed by Whitehead: "Every time we make therapeutic contact with our patients we are engaging profound processes that tap into essential life forces in our selves and in those we work with . . . *Emotions are deepened in intensity and sustained in time when they are intersubjectively shared.* This occurs at moments of *deep contact* (Whitehead, 2006, p. 624, author's italics)." At moments of deep contact, intersubjective psychobiological resonance between the patient's and clinician's relational unconscious generates an interactively regulated amplification of arousal and affect, and so unconscious affects are deepened in intensity and sustained in time. This increase of emotional intensity (energetic arousal) allows dissociated affects beneath levels of awareness to emerge into consciousness in both members of the therapeutic dyad.

"Heightened affective moments" of the treatment afford opportunities for right brain interactive affect regulation, the core of the attachment process. Ogden concludes—

Interactive psychobiological regulation . . . 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. (Ogden, Pain, Minton, & Fisher, 2005, p. 22)

In a seminal article in the clinical psychology literature, Greenberg (2007) 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" (p. 415). He proposes that this explicit form of affect regulation is performed by the verbal left hemisphere, and unconscious bodily based emotion is usually not addressed. This regulatory mechanism is at the core of verbal-analytic understanding and controlled reasoning, and is heavily emphasized in models of cognitive-behavioral therapy. In contrast to this conscious emotion regulation system, Greenberg describes a second, more fundamental implicit affect regulatory process performed by the right hemisphere that rapidly and automatically processes facial expression, vocal quality, and eye contact in a relational context. This type of therapy attempts not control but the "acceptance or facilitation of particular emotions," including "previously avoided emotion," 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" (2007, p. 416).

### Right Brain Relational Mechanisms of Therapeutic Change

In cases of early attachment maturational failures, especially histories of relational trauma, deep emotional contact and implicit interactive affect regulation are central mechanisms of right brain psychotherapy change processes. Recall, the hallmark of trauma is damage to the relational life (Herman, 1992). The repair and resolution of relational trauma therefore must occur in a therapeutic relational context. In this challenging work, more so than cognitive understanding, relational factors lie at the core of the

change mechanism. The clinical work involved in traumatic reenactments involves a profound commitment by both participants in the therapeutic dyad and a deep emotional involvement on the part of the therapist. These types of cases, difficult as they may be, represent valuable learning experiences for the therapist, and they call for expert skills (Schore, 2012). Ultimately, effective psychotherapeutic treatment of early evolving self pathologies (including personality disorders) can facilitate neuroplastic changes in the right brain, which is dominant for attachment functions throughout the life span. This interpersonal neurobiological mechanism allows optimal longer term treatment to potentially transform disorganized–disoriented attachments into “earned secure” attachments.

That said, the developing right brain system (“right mind,” Ornstein, 1997) is relationally impacted in all attachment histories, including insecure organized and secure attachments. Regulation theory’s transtheoretical clinical perspective that describes the basic psychoneurobiological processes of therapeutic action applies to all patients, insecure and secure, and to all forms of psychotherapy. In a recent neuroimaging study Tschacher, Schildt, & Sander (2010) contend, “psychotherapy research is no longer concerned with efficacy but rather with how effective change occurs” (p. 578). Changes mediated by affectively focused, relationally oriented psychotherapy are imprinted into the right brain, which is dominant for the nonverbal, implicit, holistic processing of emotional information and social interactions (Decety & Lamm, 2007; Hecht, 2014; Schore, 2012; Semrud-Clikeman, Fine, & Zhu, 2011). The right brain is centrally involved in implicit (vs. explicit) affectivity, defined as “individual differences in the automatic activation of cognitive representations of emotions that do not result from self-reflection” (Quirin, Kazen, Rohmann, & Kuhl, 2009, p. 4012). It also predominates over the left for coping with and assimilating novel situations but also for emotional resilience (see Schore, 2012). These adaptive functions are mobilized in the change processes of psychotherapy.

Long-term treatment allows for the evolution of more complex psychic structure, which in turn can process more complex right brain functions (e.g., intersubjectivity, empathy, affect tolerance, stress regulation, humor, mutual love, and intimacy). The growth-facilitating relational environment of a deeper therapeutic exploration of the relational–emotional unconscious mind can induce plasticity in both the cortical and subcortical systems of the patient’s right brain. This increased connectivity in turn generates more complex development of the right-lateralized biological substrate of the human unconscious, including alterations of the patient’s nonconscious internal working model that encodes more effective coping strategies of implicit affect regulation and thereby adaptive, flexible switching of self-states in different relational contexts. This interpersonal neurobiological mechanism underlies Jordan’s assertion that “people grow throughout and toward relationships throughout the life span” (Jordan, 2000, p. 1007).

The intrinsically relational aspect of regulation theory also models the reciprocal changes in the clinician’s right brain that result from working repeatedly with therapeutic processes (Schore, 2012). Recall the APA’s characterization of clinical expertise as “interpersonal skill,” expressed in “encoding and decoding verbal and nonverbal responses” and “responding empathically to the patient’s explicit and implicit experiences.” With clinical experience (the proverbial “10,000 hours”), psychotherapists of all

schools can potentially become expert in nonverbal intersubjective processes and *implicit relational knowledge*, which enhance therapeutic effectiveness. The professional growth of the clinician reflects progressions in right brain relational processes that underlie clinical skills, including affective empathy (Decety & Chaminade, 2003; Schore, 1994), the ability to tolerate and interactively regulate a broader array of negative and positive affective self-states (Schore, 2003b, 2012), implicit openness to experience (DeYoung, Grazioplene, & Peterson, 2012), clinical intuition (Marks-Tarlow, 2012; Schore, 2012), and creativity (Asari et al., 2008; Mihov, Denzler, & Forster, 2010). In a very recent comprehensive overview of laterality research Hecht (2014) states—

Mounting evidence suggests that the right hemisphere has a relative advantage over the left hemisphere in mediating social intelligence—identifying social stimuli, understanding the intentions of other people, awareness of the dynamics in social relationships, and successful handling of social interactions. (p. 1)

I would argue that clinical experience enhances the therapist’s right brain “social intelligence.”

Regulation theory proposes that the core clinical skills of any effective psychotherapy are right brain implicit capacities, including the ability to empathically receive and express bodily based nonverbal communications, the ability to sensitively register very slight changes in another’s expression and emotion, an immediate awareness of one’s own subjective and intersubjective experience, and the regulation of one’s own and the patient’s affect. All techniques sit atop this relational substratum. As Valentine and Gabbard (2014) have eloquently stated, “Technique, in general, should be invisible. The therapist should be viewed by the patient as engaging in a natural conversational dialog growing out of the patient’s concerns; the therapist should not be perceived as applying a stilted, formal technique” (p. 60). Over the course of the treatment, in an array of emotionally charged clinical exchanges the empathic therapist is flexibly accessing a storehouse of affective experiences gained over the course of his or her career. A relational perspective of professional development dictates that the continuously evolving psychotherapist frequently reflects on the subjective experiences of *being with* patients, including not only *the patients’* unique personalities, but also *their own* conscious and especially unconscious intersubjective coparticipation in the therapeutic process.

To be optimally effective in treating the regulatory and relational deficits of both psychiatric and personality disorders, the expert clinician learns how to fluidly access not only the patient’s left-lateralized conscious mind and explicit self, but even more importantly the patient’s right-lateralized unconscious mind and implicit, bodily based self. This principle applies to clinical psychology’s models of both assessment and treatment. Interestingly, as opposed to verbal questionnaires that measure explicit functions, projective tests, such as the Rorschach and Thematic Apperception Test directly tap into right brain implicit functions (Asari et al., 2008; Hiraishi et al., 2013). Indeed Finn (2012) is now applying regulation theory to Rorschach assessments of right brain attachment failures (see also the use of the Adult Attachment Projective Picture System by Finn, 2011; and the Operant Motive Test by Quirin, Gruber, Kuhl, & Dusing, 2013).

In addition, the *explicit knowledge* the psychologist acquires from studying the rapidly expanding amount of clinically relevant interdisciplinary research is essential to professional growth. My ongoing studies indicate that the current explosion of information on early social–emotional development, attachment, relational trauma, unconscious processes, and developing brain functions is directly relevant to clinical models of psychotherapeutic change. The expanding knowledge of the biological and medical disciplines that border psychology needs to be incorporated into and thereby update our professional curriculum, training, and internship programs, where it can promote more effective relational and therapeutic skills.

The practice of psychotherapy is not just explicitly teaching the patient coping skills. Rather, it is fundamentally relational: the therapeutic alliance, the major vector of change is, in essence, a two-person system for (implicit) self exploration and relational healing. At all points in the life span, this emotional growth of the self that supports emotional well-being is facilitated in relational contexts, as described above. The importance of “context” is currently highlighted by all scientific and clinical disciplines. For most of the past century, science equated context with the organism’s physical surround; this has now shifted to the social, relational environment. All human interactions, including those between therapist and patient as well as researcher and experimental subject occur within a relational context, in which essential nonverbal communications are transmitted at levels beneath conscious awareness, thereby activating/deactivating basic homeostatic processes in both members of an intersubjective dyad. This reciprocal communication between the relational unconscious of both members of the therapeutic alliance is described by Casement (1985): “It is usual for therapists to see themselves as trying to understand the unconscious of the patient. What is not always acknowledged is that the patient also reads the unconscious of the therapist, knowingly or unknowingly” (p. 3). The ubiquitous expression of the relational unconscious in the therapeutic alliance strongly supports psychodynamic, interpersonal models of psychotherapy, as well as amplifying Sigmund Freud’s call for paradigm shifting scientific explorations of the unconscious in everyday life.

At the beginning of this work I suggested that a paradigm shift is now occurring across a number of disciplines, from left brain conscious cognition to right brain unconscious, relational, emotional functions. Writing in the neuropsychanalytic literature on “Emotions, unconscious processes, and the right hemisphere” Gainotti (2005) concludes—

[T]he right hemisphere subserves the lower “schematic” level (where emotions are automatically generated and experienced as “true emotions”) whereas the left hemisphere the higher “conceptual” level (where emotions are consciously analyzed and submitted to intentional control). (p. 71)

In his masterly review of brain laterality research, Iain McGilchrist (2009) asserts—

If what one means by consciousness is the part of the mind that brings the world into focus, makes it explicit, allows it to be formulated in language, and is aware of its own awareness, it is reasonable to link the conscious mind to activity almost all of which lies ultimately in

the left hemisphere. (p. 188)

On the other hand—

The right hemisphere, by contrast, yields a world of individual, changing, evolving, interconnected, implicit, incarnate, living beings within the context of the lived world, but in the nature of things never fully graspable, always imperfectly known—and to this world it exists in a relationship of care. (p. 174)

Psychotherapy, “a relationship of care,” can alter more than the left-lateralized conscious mind; it also can influence the growth and development of the unconscious “right mind.” It is undoubtedly true that both brain hemispheres contribute to effective therapeutic treatment, but in light of the current relational trend that emphasizes “the primacy of affect,” the right brain, the “social,” “emotional” brain is dominant in all forms of psychotherapy.

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