

A Neuropsychanalytic Viewpoint

Commentary on Paper by Steven H. Knoblauch

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In October 2004 it was my pleasure to present at a cutting-edge conference entitled *The Interplay of Implicit and Explicit Processes in Psychoanalysis*. In addition to offering an address (“The Essential Role of the Right Brain in the Implicit Self: Development, Psychopathogenesis, and Psychotherapy”), I also provided a commentary to Steven Knoblauch’s excellent paper, “Body Rhythms and the Unconscious: Toward an Expanding of Clinical Attention.” In the following, I briefly summarize these presentations, with the purpose of showing how current advances in developmental and neuropsychanalysis are being incorporated into the practice of clinical psychoanalysis. This work is part of an ongoing effort to expand regulation theory, an overarching theoretical model of the development, psychopathogenesis, and treatment of the implicit self.

PSYCHOANALYSIS, THE SCIENTIFIC STUDY OF THE UNCONSCIOUS MIND, IS now forging deeper connections with the other sciences in order to generate clinical models of psychic structural systems that are compatible with what is now known about biological structures as they exist in nature. In particular, neuroscientists are becoming intensely interested in the domain of implicit, nonconscious processes. Neuroimaging technologies that study brain functions as they operate in real time, processes so rapid that they occur in time frames beneath conscious awareness, are providing data directly relevant to current psychoanalytic explorations of implicit processes. The neuroscientist Joseph LeDoux (2002) has recently asserted, “That explicit and implicit aspects of the self exist is not a particularly novel idea. It is closely related to Freud’s partition of the mind into conscious,

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preconscious (accessible but not currently accessed), and unconscious (inaccessible) levels” (p. 28).

The last decade has seen significant advances in both neurobiological research on the brain and psychoanalytic studies of the mind. In three volumes that span this period, I have documented how the convergence of these disciplines has produced more complex models of brain/mind/body that are both clinically applicable and experimentally testable (Schore, 1994, 2003a, 2003b). The simultaneous and parallel expansion of knowledge within both disciplines, and even more importantly, the mutually enriching cross-fertilization of knowledge across disciplines, are now profound enough to fuel a paradigm shift. The current dialogue between the biological and psychological sciences is allowing for a realization of Freud’s prediction of a rapprochement between psychoanalysis and the natural sciences (Schore, 1997a).

This integration has facilitated the current revitalization and expansion of neuropsychanalysis, the primordial source of clinical psychoanalysis (Freud, 1895). Because psychoanalysis has from its very beginnings shown a continuous intense interest in the earliest stages of the development of the mind, the emergent discipline of developmental neuropsychanalysis has been a fertile repository for the incorporation of interdisciplinary data from developmental psychology, developmental biology, and developmental neurochemistry. This newest subdiscipline of psychoanalysis has returned to the fundamental problem of the mechanisms of developmental change, but now change of psychic function *and* structure are its focus. The result is the generation of more complex psychoneurobiological models of change of brain/mind/body, not only in the earliest but in all subsequent stages of the development.

Because implicit nonverbal functions mature so very early in development, before later forming verbal explicit systems, in my writings I have focused upon the unique operations of the early maturing right hemisphere. From infancy throughout all later stages of the life span, this early evolving right lateralized system (Chiron et al., 1997) is centrally involved in implicit learning (Hugdahl, 1995) and in the control of vital functions supporting survival and enabling the organism to cope with stresses and challenges (Wittling and Schweiger, 1993). I have therefore suggested that the implicit self-system of the right brain that evolves in preverbal stages of

development represents the biological substrate of the dynamic unconscious (Schore, 2002a).

Indeed, neuroscience authors are now concluding that “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, p. 7), that this early maturing hemisphere is centrally involved in “maintaining a coherent, continuous and unified sense of self” (Devinsky, 2000, p. 69), and that “a nondominant frontal lobe process, one that connects the individual to emotionally salient experiences and memories underlying self-schemas, is the glue holding together a sense of self” (Miller et al., 2001, p. 821).

The right brain plays a central role in a number of psychiatric conditions (Cutting, 1992), as well as in various attachment disorders and self pathologies (Schore, 1994, 2002b, 2002c, 2003c). Such deficits in implicit subjective and intersubjective functions reflect impairments of this hemisphere’s central role in nonverbal communication and self-regulation. These deficits are, of course, a focus of updated intersubjective models of developmentally oriented psychoanalytic psychotherapy. Decety and Chaminade (2003) describe right brain operations essential for adaptive interpersonal functioning, ones specifically activated in the therapeutic alliance: “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, are largely dependent upon . . . right hemisphere resources, which are the first to develop” (p. 591). Right brain increases in implicit relational knowledge stored in the nonverbal domain (Stern et al., 1998) thus lie at the core of the psychoanalytic change process.

In my 1994 book, I characterized the nature of then extant investigations of the psychotherapy process:

The bulk of such research . . . focuses upon the patient’s verbal outputs as the primary data of the psychotherapeutic process. Often this material is represented in transcripts and not actual recordings of a patient’s (and incidentally the therapist’s) verbal behaviors. Such samples totally delete the essential “hidden” prosodic cues and visuo-affective transactions that are communicated between patient and therapist. I suggest that the

almost exclusive focus of research on verbal and cognitive rather than nonverbal and affective psychotherapeutic events has severely restricted our deeper understanding of the dyadic therapy process. In essence, studying only left hemispheric activities can never elucidate the mechanisms of the socioemotional disorders that arise from limitations of right hemispheric affect regulation [p. 469].

Ten years later, the October 2004 conference focused directly upon the nonverbal mechanisms that underlie the implicit processes embedded within the psychoanalytic encounter. Has our understanding of the deeper mechanisms that underlie the change process progressed in the last decade? And if so, how can this knowledge be translated into clinical practice?

With this introduction in mind, in the following I first briefly present recent information from developmental psychoanalysis on the intersubjective origins of the implicit self. Then, referring to Knoblauch's astute clinical observations, I outline neuropsychanalytic models of the implicit mechanisms that generate the intersubjective field cocreated within the therapeutic alliance, and finally I describe updated clinical psychoanalytic conceptions of right-brain/mind/body implicit affective transactions embedded within transference-countertransference communications. Throughout, in order to facilitate the dialogue between psychoanalysis and the other sciences, I offer the actual voices of neuroscientists by including a large number of direct quotes. This work represents a further elaboration of my ongoing regulation theory, which suggests that implicit mechanisms lie at the core of the psychotherapy change process, and that the right brain is dominant in psychoanalytic work (Schore, 1994, 2003a, b).

Developmental Neuropsychanalysis: The Intersubjective Origins of the Implicit Self

Lyons-Ruth (1999) offers a concise definition of implicit processes and ties their early development into current clinical psychoanalytic models:

Both psychoanalytic theory and cognitive science agree that meaning systems include both conscious (e.g., verbalizable or

attended to) aspects of experience and unconscious or implicitly processed aspects of experience. Implicit processing in modern cognitive science is applied to mental activity that is repetitive, automatic, provides quick categorization and decision-making, and operates outside the realm of focal attention and verbalized experience. Although not discussed in the cognitive literature, implicit processing may be particularly relevant to the quick and automatic handling of nonverbal affective cues, which are recognized and represented early in infancy in complex “proto-dialogues” (Trevvarthen, 1980) and so have their origins prior to the availability of symbolic communication [pp. 586–587].

In my continuing studies of human development, summarized in a recent paper (Schoe, 2005), I have described how intersubjective affective experiences embedded in the attachment relationship with the mother influence the maturation of emotion processing limbic circuits of the developing right brain, dominant for the emotional self (Devinsky, 2000). A large body of interdisciplinary data on the essential role of the right brain in the dynamic processes of the implicit self bears directly upon Lyons-Ruth’s description that implicit processing underlies the quick and automatic handling of nonverbal affective cues in infancy. In a neurobiological characterization of the bidirectional implicit affective communications embedded in proto-dialogues, Trevvarthen (1990) described coordinated visual eye-to-eye messages, tactile and body gestures, and auditory prosodic vocalizations serving as a channel of communicative signals that induce instant emotional effects. In characterizing the essential vehicles of attachment communications, Bowlby (1969) also described “facial expression, posture, and tone of voice” (p. 120).

Both research and clinical studies are now describing in detail how the affective basic core of the nascent self actively communicates its subjective psychobiological states with the primary object in intersubjective protoconversations of coordinated visual-facial, tactile-gestural, and auditory-prosodic mutual signaling (Schoe, 2001a). The dyadic implicit processing of these nonverbal attachment communications of facial expression, posture, and tone of voice are the product of the operations of the infant’s right hemisphere interacting with the mother’s right hemisphere. This hemisphere is dominant not only for emotional communication but also for imprinting, the learning mechanism that underlies attachment

(Johnston and Rogers, 1998). Attachment experiences are thus “affectively burnt in” (Stuss and Alexander, 1999) the infant’s rapidly developing right brain, imprinting an internal working model that encodes strategies of affect regulation that act at implicit nonconscious levels.

In support of this right-brain-to-right-brain implicit communication model, neuroscientists have documented that the development of the capacity to efficiently process information from faces requires visual input to the right (and not left) hemisphere during infancy (Le Grand et al., 2003). A positron emission tomographic (PET) study of two-month-old infants looking at the image of a woman’s face showed activation of the infant’s right fusiform gyrus, the visual area that decodes facial patterns (Tzourio-Mazoyer et al., 2002). Correspondingly, a functional magnetic resonance imaging (fMRI) study of mothers looking at videos of their own four to eight-month-old infants demonstrates similar activation of the right anterior inferior temporal cortex, which processes facial emotional recognition and expression, and the right occipital gyrus, which processes visual familiarity (Ranote et al., 2004). These findings support earlier speculations in the psychoanalytic literature that “the most significant relevant basic interactions between mother and child usually lie in the visual area: the child’s bodily display is responded to by the gleam in the mother’s eye” (Kohut, 1971, p. 117); that early mental representations are specifically visually oriented (Giovacchini, 1981); and that historical visual imagery is derivative of events of early phases of development (Anthi, 1983).

With respect to tactile, gestural, and bodily based communications, most women tend to cradle infants on the left sides of their bodies. This left-cradling tendency facilitates the flow of maternal affective signals into the infant’s left ear and eye (which are processed in the developing right hemisphere), and the ensuing auditory and visual communications from the infant are then fed back to the center of emotional decoding in the mother’s right hemisphere (Manning et al., 1997). Researchers assert that this left-cradling context allows for maximal somatoaffective feedback within the dyad; they conclude, “The role of the right hemisphere is crucial in relation to the most precious needs of mothers and infants” (Sieratzki and Woll, 1996, p. 1747). In terms of the auditory-prosodic aspects of attachment communications, a recent neuroimaging study reveals that the human maternal response to an infant’s cry, a fundamental behavior of the

attachment dynamic, is accompanied by an activation of the mother's right brain, and that engrams related to emotional voices are more strongly imprinted into the infant's early maturing, more active right hemisphere (Lorberbaum et al., 2002).

Research on maternal participation in the mother–infant dialogue now indicates that “a number of functions located within the right hemisphere work together to aid monitoring of a baby. As well as emotion and face processing the right hemisphere is also specialized in auditory perception, the perception of intonation, attention, and tactile information,” according to Bourne and Todd (2004, pp. 22–23). These authors refer to the adaptive importance of “optimal transmission of affective information to the right hemisphere” (p. 22). Studies on the infant side of the dyadic system complement this right lateralization communication model. In earlier work, Semrud-Clikeman and Hynd (1990) concluded, “The emotional experience of the infant develops through the sounds, images, and pictures that constitute much of an infant's early learning experience, and are disproportionately stored or processed in the right hemisphere during the formative stages of brain ontogeny” (p. 198).

It is important to note that these early experiences may be regulated or dysregulated, imprinting either secure or insecure attachments and thereby a resistance against or vulnerability to future psychopathologies. The intersubjective deficits of these disorders represent right and not left brain dysfunctions. According to Feinberg and Keenan (in press):

The right hemisphere, particularly the right frontal region, under normal circumstances plays a crucial role in establishing the appropriate relationship between the self and the world. . . . Dysfunction results in a *two-way disturbance* of personal relatedness between the self and the environment that can lead to disorders of *both* under- and over-relatedness between the self and the world [p. 15; italics added].

As previously mentioned, deficits in subjectivity and intersubjectivity are repaired in therapeutic contexts that optimize intersubjective communication and interactive regulation.

The right hemisphere is dominant for the broader aspects of communication (van Lancker and Cummings, 1999), and for subjective emotional experiences (Wittling and Roschmann, 1993).

The implicit communication of affective states between the right brains of members of infant–mother and patient–therapist dyads is thus best described as intersubjectivity. In both the developmental and therapeutic growth-facilitating contexts, the neurobiological form of the intersubjectivity principle is expressed in the dictum, “The self-organization of the developing brain occurs in the context of a relationship with another self, another brain” (Schore, 1996, p. 60).

Nonconscious affective transactions between resonating right hemispheres, dominant for nonverbal communication (Benowitz et al., 1983), thus underlie Orlinsky and Howard’s (1986) observation that the “nonverbal, 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.” This latter phrase certainly applies to the psychotherapeutic context. So right brain transactions also mediate Davies’s (1996) relational unconscious as it is expressed in the psychoanalytic encounter, and Lyons-Ruth’s (2000) affective exchanges of implicit relational knowledge within the therapeutic alliance: “[M]ost relational transactions rely heavily on a substrate of affective cues that give an evaluative valence or direction to each relational communication and these communications are carried out at an implicit level of rapid cueing and response that occurs too rapidly for simultaneous verbal translation and conscious reflection” (pp. 91–92).

Neuropsychanalysis: Implicit Communications within the Therapeutic Alliance

Scaer (2005) describes essential implicit communications embedded within the doctor–patient 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, along with other . . . therapist behaviors just noted, contribute to the unconscious establishment of a safe, healing environment. . . .

The behavior of the body indeed contains important messages that determine the nature of the interaction between . . . therapist and patient [pp. 167–168].

More so than verbalizations, these right brain communications convey expressions of the personality of the therapist.

Over the course of my writings, I have offered information from a number of disciplines in order to generate clinical models that elucidate the nonconscious implicit interactive affect communicating and regulating mechanisms within the therapeutic alliance cocreated by the patient and empathic therapist (Schore, 1994, 1997b, 2001b, 2002b, d, 2003d, e). The direct relevance of developmental studies to the psychotherapeutic process derives from the commonality of implicit intersubjective right-brain-to-right-brain emotion-transacting and regulating mechanisms in the caregiver–infant relationship and the therapist–patient relationship. In recent work, I described the nature of implicit and explicit processes in the psychotherapeutic context:

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 socioemotional information at levels beneath awareness [Schore, 2003b, p. 52].

In his paper, Knoblauch raises the fundamental question, “How do we access what is being communicated . . . but not symbolized with words?” In this inquiry, he refers to Bucci’s work on subsymbolic processing and cites her observation, “We recognize changes in the 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). Recall Bowlby’s (1969) description of infant–mother attachment communications occurring within a context of “facial expression, posture, tone of voice, physiological changes, tempo of movement, and incipient action” (p. 120). Current neuroscience adds much to our understanding of the essential psychoneurobiological mechanism that mediates the subtle, rapid, and thereby nonconscious system of nonverbal communication. Recall that the right hemisphere stores a vocabulary for nonverbal

affective signals such as facial expressions, prosody, and gestures (Bowlby's description of the attachment system).

These implicit communications are thus also expressed within the therapeutic alliance, in nonconscious communications of facial expressions, gestures, and prosody between the patient's and therapist's right brain systems. Studies in affective and social neuroscience now reveal the central role of the right hemisphere in the recognition of faces, especially in the *reception* of information communicated in emotionally expressive faces (Nakamura et al., 1999; Dimberg and Petterson, 2000). Hoshiyama et al. (2003) describe a right hemisphere dominance for the subconscious perception of faces:

In daily life, we are surrounded by a bewildering array of signals, which are perceived and processed subconsciously. [Subliminal exposure to] very weak or brief stimuli affects performance and changes in [brain] evoked potentials, although the stimuli themselves cannot be consciously detected [p. 435]. . . . Face recognition . . . may be important or even vital for humans to live in a social setting [p. 441].

Implicit communications are also expressed in the therapeutic dyad as right hemispheric functions in the *expression* of facial emotion (Blonder et al., 1993). Research now clearly shows that the left side of the face (controlled by the right hemisphere) is more expressive of emotion. Mandal and Ambady (2004) conclude, "The right side of the face (controlled by the left hemisphere) offers socially appropriate clues whereas its left side (controlled by the right hemisphere) divulges hidden personalized feelings" (p. 23). These authors also assert,

Human beings rely extensively on nonverbal channels of communication in their day-to-day emotional as well as interpersonal exchanges. The verbal channel, language, is a relatively poor medium for expressing the quality, intensity and nuancing of emotion and affect in different social situations. . . . The face is thought to have primacy in signaling affective information [p. 23].

Early in the last century, Wolff (1933) speculated that the left side of the face portrays more personalized, hidden, and unconscious content while the right side of the face reveals more social, explicit, and conscious content of personality. These data are directly relevant

to Winnicott's (1960) description of the true and false self and clearly imply that the false self is expressed in the activities of the left brain, the conscious mind, and the explicit verbal self.

Another form of right-brain-driven implicit communications within the therapeutic alliance is gaze-mirroring. Knoblauch describes heightened affective moments in which the patient "looked directly into [his] eyes" and later "dropped her gaze." The right hemisphere is dominant for mutual gaze, "the process during which two persons have the feeling of a brief link between their two minds" (Wicker et al., 1998, p. 221), and the right superior temporal sulcus and right fusiform gyrus are activated in mutual and averted social gaze (Watanabe, Miki, and Kakigi, 2002; Pelphrey, Viola, and McCarthy, 2004).

Spontaneous gestures, another right brain mechanism of nonverbal communication (Blonder et al., 1995), are also implicitly expressed within the therapeutic dyad. According to Sapir (1927), "We respond to gestures . . . in accordance with an elaborate and secret code that is written nowhere, known by none and understood by all" (p. 892). Gallagher and Frith (2004) distinguish expressive gestures (which express inner feeling states) and activation of right superior temporal sulcus, from instrumental gestures (designed to influence the immediate behavior of another) and activation of a left-lateralized system associated with language and motor imitation.

And last, as in the developmental attachment context, right-brain-to-right-brain prosodic communications also act as an essential vehicle of implicit communications within the therapeutic relationship. Knoblauch emphasizes the value of attending to "subtle shifts in vocal tone, rhythm, and turn-taking." Mitchell et al. (2003) refer to "the importance of the right hemisphere in the processing of emotional prosody" (p. 1410):

When listening to speech, we rely upon a range of cues upon which to base our inference as to the communicative intent of others. To interpret the meaning of speech, how something is said may be as important as what is actually said. Prosody . . . conveys different shades of meaning by means of variations in stress and pitch—irrespective of the words and grammatical construction [p. 1410].

A large body of research using a variety of experimental designs now shows a clear right hemispheric specialization for prosody or speech melody (Weintraub and Mesulam, 1981; Blonder, Bowers, and

Heilman, 1991; George et al., 1996; Ross, Thompson, and Yenkosky, 1997), processing of pitch information (Meyer et al., 2002), and analysis of voice perception containing salient paralinguistic information necessary for interpretation of an utterance (Lattner, Meyer, and Friederici, 2005). Furthermore, according to Sieratzki and Woll (1996),

Listening experiments with neonates and adults have shown differences in accuracy and speed of response to left-ear and right-ear stimuli; the right ear is better at recognizing the structural aspects of speech; the left ear is better at recognizing music and the melodic aspects of language, in particular, affective intonation [p. 1748].

These data support earlier psychoanalytic suggestions that the preverbal elements of language—intonation, tone, force, and rhythm—are stir-up reactions derived from the early mother–child relationships (Greenson, 1978). In the more recent literature on the psychoanalytic context, Andrade (2005) concludes, “It is the affective content of the analyst’s voice—and not the semantic content—that has an impact on the patient’s store of implicit memories” (p. 683).

A common misconception of many scientists and clinicians is that the left hemisphere is uniquely specialized for all language functions. But it is now well established that the right and not left hemisphere is dominant not only for prosody but also for the processing of emotional words (Bowers, Bauer, and Heilman, 1993), the detection of one’s first name (Perrin et al., 2005), humor (Borod et al., 2000), laughter (Meyer et al., 2005), social discourse (Bryan and Hale, 2001), metaphor (Sotillo, et al., 2005), and the organization of information at the pragmatic-communicative level as well as in the generation and modification of mental models that fit a text (Marini et al., 2005). These data are relevant to psychoanalysts’ interest in interpretation, as well as in the unique affectively charged language that occurs in the therapeutic intersubjective context.

It is important to stress that all of these implicit nonconscious right-brain/right-mind/body nonverbal communications are bidirectional and thereby intersubjective (see Schore, 2002d, 2003b for a right-hemisphere-to-right hemisphere model of projective identification, a fundamental process of implicit communication within the therapeutic alliance). Meares (2005) describes,

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].

More than explicit left-brain-to-left-brain verbal communications, implicit right-brain-to-right-brain intersubjective transactions lie at the core of the therapeutic relationship. They mediate what Sander (1992) calls moments of meeting between patient and therapist, and what Knoblauch describes as clinically pivotal relational influences that occur as a result of critical subjective coloring of experience on the part of both analytic participants. In light of current neurobiological data suggesting (according to van Lancker and Cummings, 1999) that "while the left hemisphere mediates most linguistic behaviors, the right hemisphere is important for broader aspects of communication" (p. 95), I have proposed that, just as the left brain communicates its states to other left brains via conscious linguistic behaviors, so the right brain nonverbally communicates its unconscious states to other right brains that are tuned to receive these communications (Schoe, 2003b).

Relational psychoanalytic models thus describe how implicit systems of the therapist interact with implicit systems of the patient. Knoblauch refers to the usual representation of Freud's technique as the "talking cure." In light of the above recent data from developmental and neuropsychanalysis, I suggest that psychoanalysis is not the "talking" but the "communicating" cure.

Clinical Psychoanalysis: Implicit Right-Brain/Mind/Body Transactions within Transference–Countertransference Communications

Freud (1912) offered the clinical dictum that the therapist should "turn his own UCS like a receptive organ towards the transmitting UCS of the patient" (pp. 111–112). Advances in neuroscience now clearly suggest that the capacity to receive and express communications

within the implicit realm is optimized when the clinician is in a state of right brain receptivity. Marcus (1997) observes, "The analyst, by means of reverie and intuition, listens with the right brain directly to the analysand's right brain" (p. 238). The neuroscience literature holds that "the left hemisphere is more involved in the foreground-analytic (conscious) processing of information, whereas the right hemisphere is more involved in the background-holistic (subconscious) processing of information" (Prodan et al., 2001, p. 211). The state of "evenly hovering attention" cited by Knoblauch thus represents a shift of dominance from left to right hemisphere.

Indeed, the right hemisphere uses an expansive attention mechanism that focuses on global features while the left uses a restricted mode that focuses on local detail (Derryberry and Tucker, 1994), a characterization that fits Knoblauch's "expanding of clinical attention." In contrast to the left hemisphere's activation of "narrow semantic fields," the right hemisphere's "coarse semantic coding is useful for noting and integrating distantly related semantic information" (Beeman, 1998, p. 279), a function that allows for the process of free association. Bucci (1993) has described free association as following the tracks of nonverbal schemata, by loosening the hold of the verbal system on the associative process and giving the nonverbal mode the chance to drive the representational and expressive systems, that is, by shifting dominance from a left to right hemispheric state.

Furthermore, these nonverbal affective and thereby mind/body communications are expressions of the right brain, the locus of the corporeal self. According to Adolphs et al. (2000),

Recognizing emotions from visually presented facial expressions requires right somatosensory cortices. . . . We recognize another individual's emotional state by internally generating somatosensory representations that simulate how the individual would feel when displaying a certain facial expression [p. 2683].

The right brain is centrally involved in the analysis of direct kinesthetic information received by the subject from his own body, an essential implicit process. This hemisphere, and not the linguistic, analytic left contains the most comprehensive and integrated map of the body state available to the brain (Damasio, 1994).

Within the right brain limbic areas in the insula, a structure embedded in the right temporal lobe, and the orbital cortex, a structure

located in the right prefrontal lobe, play significant roles in the processing of bodily based information. The right anterior insular cortex supports a representation of visceral responses accessible to awareness, providing a substrate for subjective feeling states (Critchley et al., 2004). The right orbitofrontal cortex is critical to interoception, the implicit subjective evaluation of the physiological condition of the body and the differentiation of an affect associated with a bodily feeling (Craig, 2003). Indeed, studies now indicate that individual differences in subjective interoceptive awareness, and by extension emotional depth and complexity, are expressed in the degree of expansion of the right anterior insula and adjacent orbitofrontal cortices (Craig, 2004).

The therapist's right hemisphere thus allows him or her to know the patient "from the inside out" (Bromberg, 1991, p. 399). To do this, the clinician must access his or her own bodily based intuitive responses to the patient's implicit bodily based communications. In his case study, Knoblauch describes awareness of "a shift in my attention to her body *and* my body." In an elegant description Mathew (1998) evocatively portrays this omnipresent implicit process of bodily communications: "The body is clearly an instrument of physical processes, an instrument that can hear, see, touch and smell the world around us. This sensitive instrument also has the ability to tune in to the psyche: to listen to its subtle voice, hear its silent music and search into its darkness for meaning" (p. 17).

Both recent scientific data and clinical observations thus strongly suggest that intersubjectivity—a central construct of current developmental, clinical, and neuropsychology—is more than a match or communication of explicit cognitions, and that the intersubjective field coconstructed by two individuals includes not just two minds but two bodies (Schoore, 1994, 2003a, 2003b). In other words, at the psychobiological core of the intersubjective field is the attachment bond of emotional communication and interactive regulation. According to Pipp and Harmon (1987), the fundamental role of nonconscious attachment dynamics is interactive regulation: "It may be that throughout the life span we are biologically connected to those with whom we have close relationships. . . . Homeostatic regulation between members of a dyad is a stable aspect of all intimate relationships throughout the life span" (p. 651). The critical elements of implicit unconscious intersubjective communications embedded in affectively charged attachment transactions are more than *mental*

contents; rather, they are interactively communicated and regulated and dysregulated *psychobiological somatic processes* that mediate shared conscious and unconscious emotional states. Recall Freud's remark to Groddeck: "The unconscious is the proper mediator between the somatic and the mental, perhaps the long-sought 'missing link'" (quoted in Groddeck, 1977, p. 38).

The essential biological purpose of intersubjective communications in all human interactions, including those embedded in the psychobiological core of the therapeutic alliance, is the regulation of right-brain/mind/body states. These ideas fit nicely with Knoblauch's assertion that analytic attention to embodied experience is central to therapeutic action. They also resonate with Shaw's (2004) conclusion:

Psychotherapy is an inherently embodied process. If psychotherapy is an investigation into the intersubjective space between client and therapist, then as a profession we need to take our bodily reactions much more seriously than we have so far because . . . the body is "the very basis of human subjectivity" [p. 271].

There is now a growing consensus that, despite the existence of a number of distinct theoretical perspectives in psychoanalysis, the clinical concepts of transference (Wallerstein, 1990) and countertransference (Gabbard, 2001) represent a common ground. In a description that echoes psychoanalytic conceptions of transference, Shuren and Grafman (2002) propose:

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].

Other findings that the right rather than the left hemisphere appears to respond to preattentive negative emotional stimuli (Kimura et al., 2004) suggest that negative transference is specifically mediated by the right brain.

Transference-countertransference transactions thus represent nonconscious nonverbal right-brain mind body communications. Transference has been described as "an expression of the patient's

implicit perceptions and implicit memories” (Bornstein, 1999). Studies reveal that facial indicators of transference are expressed in cues quickly appraised from the therapist’s face in movements around the eyes and prosodic expressions from the mouth (Krause and Lutolf, 1988). Countertransference is similarly currently defined in nonverbal implicit terms as the therapist’s “autonomic responses that are reactions on an unconscious level to nonverbal messages” (Jacobs, 1994). In monitoring countertransference responses to the patient’s implicit facial, gestural, and prosodic communications, the clinician’s right brain tracks at a preconscious level not only the rhythms and flows of the patient’s affective states, but also the clinician’s own interoceptive bodily based affective responses to the patient’s shifting arousal levels.

It is certainly true that the clinician’s left brain conscious mind is an important contributor to the treatment process. But perhaps more than other treatment modalities, psychoanalytic psychotherapeutic models have focused upon the critical functions of the therapist’s “right mind” (Ornstein, 1997). The right hemisphere plays a dominant role in the processing of affective stimuli and self-relevant information (Molnar-Szakacs, Uddin, and Iacoboni, 2005), empathy (Schoore, 1994; Devinsky, 2000; Perry et al., 2001), self-awareness (Uddin et al., 2005), affective theory of mind (Shamay-Tsoory et al., 2005) as well as in mentalizing (Ohnishi et al., 2004), functions that operate at both poles of the therapeutic relationship. A neuropsychanalytic right brain perspective of the treatment process allows for a deeper understanding of the critical factors that operate at implicit levels of the therapeutic alliance, beneath the exchanges of language and explicit cognitions. In this intersubjective dialogue, the psychobiologically attuned, intuitive clinician, from the first point of contact, is learning the nonverbal moment-to-moment rhythmic structures of the patient’s internal states and is relatively 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.

Over the ensuing stages of the treatment, the therapist’s oscillating attentiveness (Schwaber, 1995) is focused on barely perceptible cues that signal a change in state (Sander, 1992) and on nonverbal behaviors and shifts in affects (McLaughlin, 1996). The clinician’s monitoring of not unconscious content but unconscious process calls for right brain attention to his or her resonant dynamic crescendos and decrescendos to the patient’s implicit affective-arousal states, as well

as to the patient's simultaneous implicit expressions of engagement and disengagement within the coconstructed intersubjective field. This in turn allows for the therapist to act as an interactive regulator of the patient's psychobiological states. Such work "implies a profound commitment by both participants in the analytical scenario and a deep emotional involvement on the analyst's part" (Tutte, 2004, p. 915). Ultimately, effective psychoanalytic treatment of early evolving self pathologies (severe personality disorders) facilitates changes in complexity of the right hemisphere, the hemisphere that is preferentially involved in "the processing of self-images, at least when self-images are not consciously perceived" (Theoret et al., 2004, p. 57) and, indeed, in "the sense of humanness" (Mendez and Lim, 2004).

Future Directions

Contemporary psychoanalysis, which for many years has overemphasized explicit verbal cognitive mechanisms, is now focusing intensely upon implicit nonverbal communications, bodily based affective states, and interactive regulation as essential change mechanisms within the therapeutic relationship. We are now seeing a paradigm shift in the field. In a major paper on affect and the therapeutic action of psychoanalysis, 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. 697].

Andrade suggests that it is the affective link, conveyed through intersubjective "empathetic-introjective reciprocal identification" (p. 694), that leads to both psychic and somatic change.

Notice, as you read Knoblauch's paper, how frequently and with how much detail he describes his responses to the patient's nonverbal moment-to-moment shifts in body, posture, rhythm, tone, and facial expression; how this triggers his own right brain autobiographical memory system; how he uses this information in feedback

interventions; and how this in turn impacts the patient's self-regulatory functions. His statement that "spontaneously improvised, unconsciously enacted phenomena can be recognized and responded to for their mutative potential" is well supported by recent developments in developmental and neuropsychanalysis. The case is an excellent example of how even extremely difficult patients with severe early derailments of the self can be effectively treated by directly focusing upon subjective and intersubjective affective bodily based expressions of the nonverbal implicit realm. This clinical perspective allows for further development and complexity of the right brain, the biological substrate of the human unconscious.

In an upcoming chapter in a book coauthored by Knoblauch, Theodore Jacobs (2005) states, "The exploration of the nonverbal dimension in analysis constitutes one of its few remaining frontiers" (p. 185). Jacobs describes the neglect of nonverbal phenomena in psychoanalytic education today:

Many senior analysts, though highly experienced in other aspects of analysis, have had comparatively little experience in the decoding and interpretation of nonverbal data. Often uncomfortable in working with this mode of expression, they tend to slight it in favor of the more familiar and more congenial verbal material. As a consequence, communications that are conveyed through posture, gesture, movement, and other bodily means often go unrecognized [p. 185].

In the final paragraph of a clinical contribution (Schorer, 1997a), I cited an admonition from Arnold Modell (1993): "All sciences are autonomous, yet must share concepts that lie across their frontiers" (p. 194). I end here with another, from my colleague in affective neuroscience, Jaak Panksepp (2003):

If it were to turn out that the left hemisphere is more influential in most of our scientific inquiries than the right (which seems highly likely), might that constitute a biasing on the types of scientific perspectives we cultivate? To what extent might investigators' own personalities influence the types of inquiries, theories and methodologies they support and pursue? Progress toward an understanding of affective processes may be slow and theoretically lopsided . . . if selectively pursued by individuals

enriched in left hemisphere skills but impoverished in those of the right [p. 11].

Recent findings from developmental psychoanalysis and neuropsychanalysis on the critical nonverbal implicit functions of the right brain need to be incorporated into psychoanalytic training programs.

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