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Modern Attachment Theory:

The Central Role of Affect Regulation in Development and Treatment

Judith R. Schore Ph.D. and Allan N. Schore Ph.D.

The Sanville Institute and UCLA David Geffen School of Medicine

### Introduction

This special edition of the *Clinical Social Work Journal* on attachment theory affords us a valuable opportunity to put forth our ideas on what we call modern attachment/regulation theory, an interdisciplinary developmental model that has specific implications for therapeutic work. Attachment theory is deceptively simple on the surface: it posits that the real relationships of the earliest stage of life indelibly shape us in basic ways and that for the rest of the life span attachment processes lie at the center of human development. We now can explain in depth why this is so. As a result of interdisciplinary developmental and neurobiological research over the last 15 years John Bowlby's core ideas have expanded into a more complex and clinically relevant model. We will argue that at this point in time, any theory of

development and its corresponding theory of therapy must include these psychobiological findings regarding precisely how early emotional transactions with the primary object impact the development of psychic structure, that is, how affective attachment communications facilitate the maturation of brain systems involved in affect and in self regulation. The rich intricacy of an integrative theory that links brain-mind-body now encompasses all the essential elements that allow us to comprehend and treat disorders of self and affect regulation more effectively.

Bowlby's (1969) original descriptions occurred during a period of behaviorism and included an emphasis on separation and secure base *behaviors*, which evolved to a focus on *cognition* and an emphasis on attachment narratives and reflective capacities. Despite these trends, we remind the reader of Ainsworth's (1969) characterization of Bowlby's seminal *Attachment* volume: "In effect what Bowlby has attempted is to update psychoanalytic theory in the light of recent advances in biology" (p. 998). We suggest that in line with Bowlby's fundamental goal of integrating psychological and biological conceptions of human development, the current clinical and experimental focus on how affective bodily-based attachment processes are nonconsciously and interactively regulated within the mother-infant dyad, and how psychobiological attunement and relational stress impact the experience-dependent maturation of early developing brain regulatory systems, has shifted attachment theory to a regulation theory.

The advances in neurobiology initiated in the last decade, the "decade of the brain", have stimulated the transformation of classic attachment theory over the last ten years. In 1994, A. Schore integrated a large amount of existing interdisciplinary data and proposed that attachment communications are critical to the development of structural right brain systems involved in processing of emotion, modulation of stress, self-regulation, and thereby the

functional origins of the bodily-based implicit self. In 2000, within an introduction to a reissue of *Attachment*, A. Schore proposed, “In essence, a central goal of Bowlby’s first book is to demonstrate that a mutually enriching dialogue can be organized between the biological and psychological realms” (p. 24), and argued that attachment theory stresses the primacy of affect and is fundamentally a regulation theory. This linkage of the theory with affective dynamics was mirrored in Fonagy et al.’s (2000) *Affect Regulation, Mentalization, and the Development of the Self*, and Mikulincer, Shaver, and Pereg’s (2003) work on “attachment theory and affect regulation.” Indeed, Sroufe (1996) defined attachment as the dyadic regulation of emotion, and Fonagy and Target (2002) concluded that “the whole of child development to be the enhancement of self-regulation” (p. 7).

This shift of the theory into affect and affect regulation has had an important effect on translating the developmental theory into a pragmatic framework for models of both psychopathogenesis and the change process in psychotherapy. It is only in the last decade that the clinical applications of attachment theory have been articulated. Parallel to an expansion of the theory to models of psychopathogenesis by linking early attachment stressors to the neurobiology of pathological emotional development, enduring deficits in affect dysregulation, and the genesis of personality disorders, the problem of applying the theory to psychotherapy models was elucidated by focusing the treatment upon the affective dynamics of right brain insecure internal working models encoding strategies of affect regulation that are activated within the therapeutic alliance (Schore, 1994, 2001a, 2002a, 2003a). In the Seventh Annual John Bowlby Lecture, A. Schore (2001b) proposed that the empathic therapist’s capacity to regulate the patient’s arousal state within the affectively charged nonconscious transference-countertransference relationship is critical to clinical effectiveness.

The current impetus of modern attachment theory is directed toward the updating and

deepening of its underlying theoretical concepts, its increased clinical relevance, and its expanded connections with other disciplines (e.g., psychoanalysis, neuroscience, psychiatry, traumatology, pediatrics), including Clinical Social Work. From its very beginnings, attachment theory has shared with Clinical Social Work a common biopsychosocial perspective. Indeed, the field itself is now undergoing a re-examination and re-definition as the quality of master's level education is evaluated (see the March 2007 issue of this journal). We agree with the assertion of Simpson, Williams and Segall (2007) that the clinical specialization fundamentally includes two core issues, person-in-situation and relationship. The "person-in-situation" orientation encompasses not only nonconscious psychological relational dynamics beginning in infancy, but also individual biological and somatic factors, and social/cultural influences that are both internalized and situational. This biopsychosocial perspective of Clinical Social Work is absolutely consonant with modern attachment theory's elaboration of the mechanisms that operate at the unconscious psychobiological core of the intersubjective context, the brain-mind-body-environment relational matrix out of which each individual emerges. And so we argue that individual development arises out of the relationship between the brain/mind/body of both infant and caregiver held within a culture and environment that supports or threatens it.

To say this in another way, attachment experiences shape the early organization of the right brain, the neurobiological core of the human unconscious (Schore, 2003b). Clinical Social Work has long embraced the psychoanalytic concept of the importance of unconscious functions in everyday life. Indeed, therapeutic interventions are rooted in these same implicit dynamic relational processes. The co-creation of an attachment relationship between the empathic social worker and client has also been seen as the sine-qua-non of clinical practice, and respect for the individual is, and always has been, paramount. The current expansion of neurobiologically supported attachment principles of interactive affect communication and regulation that occur

beneath levels of awareness both explains and justifies this approach. The mechanisms of developmental change thus include changes in both psychic function *and* structure, not only in the earliest but also in all subsequent stages of development. Modern attachment/regulation theory is thus consonant with the recent relational intersubjective trend in the psychodynamic literature, and can be readily incorporated into the core of social work theory, research, and practice.

Towards that end, in the following we will outline the general precepts of modern attachment theory, with reference to the practice of Clinical Social Work. We will initially present an overview of the central role of unconscious interactive regulation in establishing attachment relationships and the lifelong impact this has on the development of the implicit self. We then discuss the interpersonal neurobiology of implicit nonverbal communications within the therapeutic alliance in the form of bodily-based transference-countertransference transactions. And finally, we offer some thoughts on the implications of modern attachment/regulation theory for models of clinical expertise. In doing so, we will assume a familiarity with basic concepts of classical attachment theory, object-relations, self and relational psychology and focus on integrating these models with their neurobiological underpinnings so that we end up with an interpenetrating and overarching theory.

The Psychobiological Core of Developmental Attachment Communications:

#### Interactive Regulation

The essential task of the first year of human life is the creation of a secure attachment bond of emotional communication between the infant and the primary caregiver. In order to enter into this communication, the mother must be psychobiologically attuned to the dynamic shifts in the infant's bodily-based internal states of central and autonomic arousal. During the affective communications embedded in mutual gaze episodes the psychobiologically attuned

sensitive caregiver appraises nonverbal expressions of the infant's arousal and then regulates these affective states, both positive and negative. The attachment relationship mediates the dyadic regulation of emotion, wherein the mother (primary caregiver) co-regulates the infant's postnatally developing central (CNS) and autonomic (ANS) nervous systems.

In this dialogical process the more the mother contingently tunes her activity level to the infant during periods of social engagement, the more she allows him to recover quietly in periods of disengagement, and the more she attends to his reinitiating cues for reengagement, the more synchronized their interaction. In play episodes of affect synchrony, the pair are in affective resonance, and in such, an amplification of vitality affects and a positive state occurs. In moments of interactive repair the "good-enough" caregiver who has misattuned, can regulate the infant's negative state by accurately re-attuning in a timely manner. The regulatory processes of affect synchrony that create states of positive arousal and of interactive repair that modulate states of negative arousal are the fundamental building blocks of attachment and its associated emotions. Resilience in the face of stress and novelty is an ultimate indicator of attachment security. Through sequences of attunement, misattunement, and re-attunement, an infant becomes a person, achieving a "psychological birth" (Mahler, Pine, & Bergman, 1975). This preverbal matrix forms the core of the incipient self.

Thus, emotion is initially regulated by others, but over the course of infancy it becomes increasingly self-regulated as a result of neurophysiological development. These adaptive capacities are central to self-regulation, the ability to flexibly regulate an expanding array of positive and negative psychobiological states in various contexts, and thereby assimilate these emotional-motivational states into an integrated self-system. It is important to point out that optimal attachment experiences facilitate both mechanisms of self-regulation: interactive regulation of emotions while subjectively engaged with other humans in interconnected contexts,

and autoregulation of emotions while subjectively disengaged from other humans in autonomous contexts. Optimal self function involves resilient switching between these two modes, depending upon the relational context. Both of these processes are more than cognitive, but rather psychobiological. Attachment, the outcome of the child's genetically encoded biological (temperamental) predisposition and the particular caregiver environment, fundamentally represents the regulation of biological synchronicity between and within organisms.

The fundamental role of nonconscious attachment dynamics is therefore interactive psychobiological regulation. According to Pipp and Harmon (1987), "It may be that...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 lifespan" (p. 651). At the most essential level, attachment represents the evolutionary mechanism (Bradshaw & Shaw, 2007) by which we are sociophysiologicaly connected to others (Adler, 2002). At all points of the life span interactive psychobiological regulation supports the right brain survival functions of the human self system (Schore, 2003a, b).

This principle is echoed in current developmental brain research, where Ovtcharoff and Braun (2001) report that "The dyadic interaction between the newborn and the mother...serves as a regulator of the developing individual's internal homeostasis" (p. 33). Notice the similarity to Kohut's (1971) proposal that the infant's dyadic regulatory transactions with the maternal selfobject allow for maintenance of his homeostatic equilibrium. Furthermore, attachment regulatory transactions impact the development of psychic structure, that is, they generate brain development (Schore, 1994). In very recent writings Fonagy and Target (2005) conclude,

If the attachment relationship is indeed a major organizer of brain development, as many have accepted and suggested (e.g., Schore, 1997, 2003), then the determinants

of attachment relationships are important far beyond the provision of a fundamental sense of safety or security (Bowlby, 1988). (p. 334)

Even more specifically, the regulatory function of the mother-infant interaction acts as an essential promoter of the development and maintenance of synaptic connections during the establishment of functional circuits of the right brain in critical periods of infancy (Henry, 1993; Schore, 1994; Siegel, 1999; Sullivan & Gratton, 2002; Cozolino, 2002). A growing number of studies now support the observation that right lateralized limbic areas responsible for the regulation of autonomic functions and higher cognitive processes are involved in the “formation of social bonds” and are “part of the circuitry supporting human social networks,” and that the “the strong and consistent predominance for the right hemisphere emerges postnatally” (Allman et al., 2005, p. 367).

Because implicit attachment regulatory functions mature so early in development, before later forming verbal explicit systems, A. Schore (1994, 2003a, b) has focused upon the unique operations of the earlier maturing (Chiron et al., 1997) right hemisphere. From infancy throughout all later stages of the lifespan, this right lateralized system is centrally involved in implicit affective processes and in the control of vital functions supporting survival and enabling the organism to cope with stresses and challenges. He has 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, 2002b). A growing body of studies now report that unconscious, nonverbal and emotional information processing mainly takes place in the right hemisphere (Joseph, 1992), that this hemisphere is centrally involved in “maintaining a coherent, continuous and unified sense of self” (Devinsky, 2000, p. 69), and that a right 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).

### Right Brain Nonverbal Attachment Communication:

#### The Intersubjective Origins of the Implicit Self

A. Schore has elucidated how the emotion processing limbic circuits of the infant's developing right brain, which are dominant for the emotional sense of self, are influenced by implicit intersubjective affective transactions embedded in the attachment relationship with the mother (Schore, 1994, 2005a). Implicit processing underlies the quick and automatic handling of non-verbal affective cues in infancy, and "is repetitive, automatic, provides quick categorization and decision-making, and operates outside the realm of focal attention and verbalized experience" (Lyons-Ruth 1999, p. 576). Trevarthen (1990) described how prosodic vocalizations, coordinated visual eye-to-eye messages, and tactile and body gestures, serve as channels of communicative signals in the proto dialogues between infant and mother which induce instant emotional effects. Bowlby (1969) also stated that "facial expression, posture, and tone of voice" (p. 120) are essential vehicles of attachment communications between the emerging self and the primary object (Schore, 2001a). The dyadic implicit processing of these nonverbal attachment communications are the product of the operations of the infant's right hemisphere interacting with the mother's right hemisphere. Attachment experiences are thus imprinted in implicit memory in an internal working model that encodes strategies of affect regulation and acts at implicit nonconscious levels.

Neuroscientists have documented that visual input to the right (and not left) hemisphere during infancy is essential for the development of the capacity to efficiently process information from faces (Le Grand et al., 2003). 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 the infant's ability to process the emotional tone of the voice, prosody, it is now thought that:

The right hemisphere of the neonate is actively involved in the perception of speech melody and the intonations of the voices of mother and surrounding people. The pre-speech stage of child development is characterized by interactions of the descriptive and emotional components due mainly to mechanisms operating within the hemispheres on the principle of non-verbal communication. (Bogolepova & Malofeeva, 2001, p. 353)

And on the other side of the right brain-to-right brain communication system within the attachment dyad, researchers describe the mother's processing capacities: "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" (Bourne & Todd, 2004, pp. 22-23).

It is important to note that these early experiences may be regulated or dysregulated, imprinting either secure or insecure attachments. 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). This is due to the fact that during early critical periods organized and disorganized insecure attachment histories are "affectively burnt in" the infant's rapidly developing right brain (Schoore, 2001a, 2003a). Less than optimal early relational

experiences are imprinted into the right, and not left, brain, and these internal working models of attachment are nonconsciously accessed at later points of interpersonal emotional stress. Using functional magnetic resonance imaging Buchheim et al. (2006) report that the Adult Attachment Projective activates the right inferior frontal cortex, an area involved in the control processes involved in emotion regulation. In a study of hemispheric lateralization of avoidant attachment, Cohen and Shaver (2004) conclude, “Emotional negativity and withdrawal motivation have been connected in psychophysiological studies with the right frontal lobe of the brain” (p. 801), and that avoidant individuals show a bias towards “a right hemisphere advantage for processing negative emotion and attachment-related words” (p. 807).

Summarizing a large body of neuropsychological data Feinberg and Keenan (2005) conclude:

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)

In relationally-oriented therapeutic contexts that optimize intersubjective communication and interactive regulation, deficits in internal working models of the self and the world are gradually repaired. Significantly, Bowlby (1988) asserted that the restoring into consciousness and reassessment of internal working models is the essential task of psychotherapy.

Decety and Chaminade’s (2003) characterization of higher right brain functions is directly applicable to psychotherapy of disorders of the self:

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)

These particular implicit right brain operations are essential for adaptive interpersonal functioning, and are specifically activated in the therapeutic alliance. Right brain increases in “implicit relational knowledge” stored in the nonverbal domain (Stern et al., 1998) thus lie at the core of the psychotherapeutic change process.

As the right hemisphere is also dominant for the broader aspects of communication and for subjective emotional experiences, the implicit communication of affective states between the right brains of the members of the infant-mother and patient-therapist dyads is thus best described as “intersubjectivity.” The neurobiological correlate of this 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” (Schoore, 1996, p. 60). This is true in both the developmental and therapeutic growth-facilitating contexts. The interpersonal neurobiology of modern attachment theory has thus been a rich source of information about the essential role of nonconscious, nonverbal right brain communications and intersubjectivity in the psychotherapy relationship.

#### Right Brain Nonverbal Attachment Communication:

##### Implicit Communications Within the Therapeutic Alliance

It is now accepted that the "non-verbal, prerational stream of expression that binds the infant to its parent continues throughout life to be a primary medium of intuitively felt affective-relational communication between persons" (Orlinksy & Howard, 1986, p. 343). Right brain transactions also mediate the relational unconscious as it is expressed in the psychotherapeutic encounter. Lyons-Ruth (2000) characterizes the affective exchanges that make up implicit relational knowledge within the therapeutic alliance:

Most relational transactions rely heavily on a substrate of affective cues that give an evaluative valence or direction to each relational communication. These occur at an implicit level of rapid cueing and response that occurs too rapidly for simultaneous verbal transaction and conscious reflection. (pp. 91-92)

Scaer (2005) describes essential implicit communications 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. (pp.167-168)

Such right brain communications more so than conscious verbalizations reveal the personality of the therapist.

In light of 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, developmental attachment studies have direct relevance to the psychotherapeutic process. A. Schore (2003b) delineates 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. ( p. 52)

A fundamental question of treatment is how we work with what is being communicated but not symbolized with words. In discussing subsymbolic processing, 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). These implicit communications are expressed within the therapeutic alliance between the client and therapist’s right brain systems.

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. (Mandal & Ambady, 2004, p.23)

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. The right hemisphere is important in the processing of the “music” behind our words (George et al., 1996). 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 is 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 (Mitchell et al., 2003). These data support suggestions that the preverbal elements of language - intonation, tone, force, and rhythm - stir up reactions derived from the early mother-child relationships (Greenson, 1978), the internal working models of attachment. In the recent literature on the psychotherapeutic 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).

During heightened affective moments these right brain dialogues between the relational unconscious of both the patient and therapist (like the attachment communications of the infant and mother) are examples of "primary process communication" (Dorpat, 2001). According to Dorpat, "The primary process system analyzes, regulates, and communicates an individual's relations with the environment" (p. 449). Furthermore,

[A]ffective 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. (Dorpat, 2001, p. 451)

Interestingly, in addition to psychoanalytic authors who have implicated the right brain in primary process functions (see Schore, 1994), neuroscience researchers now contend that "the right hemisphere operates in a more free-associative, primary process manner, typically observed in states such as dreaming or reverie" (Grabner et al., p. 228).

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

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. In light of current neurobiological data that suggests “While the left hemisphere mediates most linguistic behaviors, the right hemisphere is important for broader aspects of communication” (van Lancker & Cummings, 1999, p. 95), A. Schore (2003b) has proposed that just as the left brain communicates its states to other left brains via conscious linguistic behaviors so the right nonverbally communicates its unconscious states to other right brains that are tuned to receive these communications. Regulation theory thus describes how implicit systems of the therapist interact with implicit systems of the patient; psychotherapy is not the “talking” but the “communicating” cure.

#### Transference-Countertransference as Implicit Right Brain / Mind / Body Transactions

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).

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 & Tucker, 1994). 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 which 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.

These nonverbal affective and thereby mind/body communications are expressions of the right brain, which 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). The therapist's right hemisphere allows her to know the patient "from the inside out" (Bromberg, 1991, p. 399). To do this the clinician must access her own bodily-based intuitive responses to the patient's communications. 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)

Intersubjectivity is thus more than a match or communication of explicit cognitions. The intersubjective field co-constructed by two individuals includes not just two minds but two bodies (Schoore, 1994, 2003a,b). At the psychobiological core of the intersubjective field is the attachment bond of emotional communication and interactive regulation. In this regard, Pipp and Harmon (1987) assert that the fundamental role of nonconscious attachment dynamics is interactive regulation. Implicit unconscious intersubjective communications are interactively regulated and dysregulated *psychobiological somatic processes* that mediate shared conscious and unconscious emotional states, not just mental contents. 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 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 clinical work, the concepts of transference and countertransference represent a common ground. In a neuropsychological 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).

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, p. 170). Facial indicators of transference are expressed in visual and auditory affective cues quickly appraised from therapist's face. Countertransference is similarly defined in nonverbal implicit terms as the therapist's "autonomic responses that are reactions on an unconscious level to nonverbal messages" (Jacobs, 1994, p. 749). In monitoring countertransferential responses, the clinician's right brain tracks at a preconscious level not only the arousal rhythms and flows of the patient's affective states, but also her own interoceptive bodily-based affective responses to the patient's

implicit facial, gestural, and prosodic communications.

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, psychodynamic psychotherapeutic models are now intensively focusing upon the critical functions of the therapist's "unconscious right mind." The right hemisphere plays a dominant role in the processing of self-relevant information (Molnar-Szakacs et al., 2005), affective theory of mind (Schoore, 2003b), empathy (Schoore, 1994; Shamay-Tsoory et al., 2003), as well as in mentalizing (Ohnishi et al., 2004). 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 the intersubjective dialogue, the psychobiologically attuned, intuitive clinician, from the first point of contact, is learning the nonverbal moment-to-moment rhythmic structures of the client's internal states, and is relatively flexibly and fluidly modifying her own behavior to synchronize with that structure, thereby co-creating with the client a growth-facilitating context for the organization of the therapeutic alliance. The attachment between therapist and client is established over time, allowing for the expression of experiences that resonate with the original infant-mother intersubjective history of the first two years. If that was an insecure attachment to begin with, co-creating a new, secure interaction will take even longer.

Over the ensuing stages of the treatment, the sensitive empathic clinician's monitoring of unconscious psychobiological process rather than conscious verbal content calls for right brain attention in matching the patient's implicit affective-arousal states. The empathic therapist also resonates with the client's simultaneous implicit expressions of engagement and disengagement within the co-constructed intersubjective field. This in turn allows the clinician to act as an interactive regulator of the patient's psychobiological states. Such work implies a profound

commitment by both participants in the therapeutic dyad and a deep emotional involvement on the part of the therapist (Tuttle, 2004). Indeed, research now indicates that psychotherapy is superior to pharmacotherapy in patients with a history of early childhood trauma (Nemeroff et al., 2003). Ultimately, effective psychotherapeutic treatment of early evolving self-pathologies (such as severe personality disorders) facilitates changes in complexity of the right hemispheric unconscious system.

#### Further Implications of Regulation Theory for Clinical Social Work:

##### Models of Clinical Expertise

The unique biopsychosocial perspective of Clinical Social Work highlights the critical importance of unconscious forces that drive all human emotion, cognition, and behavior within a sociocultural matrix. From its beginnings, attachment theory, grounded in psychoanalysis and ethology, has focused on how real experiences, especially in childhood, directly impact the unconscious system. This is, of course, a core principle of psychodynamically oriented Clinical Social Work. Modern attachment theory, informed by neuroscience, elucidates the early experience-dependent development of the human unconscious system, which remains active over the course of the life span. In an excellent volume, *Neurobiology for Clinical Social Work*, Applegate and Shapiro (2005) apply attachment neurobiology specifically to social work practice (see review by Chernus, 2007).

We suggest that clinical expertise, especially with severely disturbed patients, relies more on nonconscious nonverbal right brain than conscious verbal left brain functions. Clinical efficacy is more than explicit left hemispheric technical skill in interpretation. Rather, increasing levels of clinical effectiveness with a broader spectrum of patients fundamentally involves more complex learning of a number of nonconscious functions of the therapist's right brain that are expressed in the therapeutic alliance. All technique sits atop these right brain implicit skills,

which deepen and expand with clinical experience: the ability to receive and express nonverbal affective communications; clinical sensitivity; use of subjectivity/intersubjectivity; empathy; and affect regulation. Neuroscience now indicates that intuition (Allman et al., 2005), creativity (Grabner et al., 2007), and indeed insight (Jung-Beeman et al., 2004), are all right, and not left, brain functions.

An American Psychological Association (APA) Presidential Task Force on Evidence-Based Practice (2006) now suggests,

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)

They further note that “Research suggests that sensitivity and flexibility in the administration of therapeutic interventions produces better outcomes than rigid application of...principles” (p. 278). This finding applies equally to the clinically sensitive expert social worker.

Sensitivity has, of course, been well-studied in the developmental attachment literature, where researchers observe that maternal sensitivity cultivates synchronous, reciprocal, and jointly satisfying mother-infant interactions, which in turn, foster the development of a secure attachment relationship. In adult attachment studies, Schachner et al. (2005) argue “nonverbal behavior and sensitivity to a relationship partner's nonverbal behavior importantly influence the quality of interpersonal interactions and relationships, including attachment relationships” (p. 141). We suggest that this attachment principle applies to the therapeutic relationship as well. The dictionary definition of sensitivity is: “susceptible to the attitudes, feelings, or circumstances of others; *registering very slight differences or changes of emotion*” (American Heritage Dictionary, year). In previous writings A. Schore (2003b) describes the operations of the

therapist's right brain by which "the sensitive clinician's oscillating attentiveness is focused on barely perceptible cues that signal a change in state, and on nonverbal behaviors and shifts in affects" (p. 52). According to Reik (1948) this skill requires that the clinician is ready to "trust tiny stimuli and register tiny impressions" that may be "hardly noticeable" (p. 141). In discussing "the art of psychotherapy" (p. 141). Bugental (1987) stresses the importance of the sensitive clinician's ability to "learn to experience finer and finer distinctions or nuances" (p. ?). He states, "The primary instrument brought to the support of the client's therapeutic efforts is the therapist's trained, practiced, and disciplined sensitivity. In many ways, this sensitivity is akin to a musical instrument which must be carefully prepared, maintained, tuned, and protected" (p. 222). The clinician's capacity for intersubjective communication depends upon her "being open to intuitive sensing of what is happening in the back of the patient's words and, often, back of his conscious awareness" (Bugental, 1987, p. 11).

This clinical sensitivity to even very subtle levels of nonverbal bodily-based attachment communications mediates the clinician's involvement in a wider array of co-created affectively charged intersubjective fields. These collaborations of the client and therapist's subjectivities in turn allow for right brain communications and interactive regulations of dysregulated affective states. The importance of this connection is stressed by Whitehead (2006):

[E]very 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. (p. 624)

A modern attachment-based clinical approach highlights the unconscious nonverbal affective more than the conscious verbal cognitive factors as the essential change process of psychotherapy. In a recent editorial of the journal *Motivation and Emotion*, Richard Ryan asserts,

After three decades of the dominance of cognitive approaches, motivational and emotional processes have roared back into the limelight. Both researchers and practitioners have come to appreciate the limits of exclusively cognitive approaches for understanding the initiation and regulation of human behavior... More practically, cognitive interventions that do not address motivation and emotion are increasingly proving to be short-lived in their efficacy, and limited in the problems to which they can be applied. (Ryan, 2007, p. 1)

Thus, at the most essential level, the intersubjective work of psychotherapy is not defined by what the therapist says to the patient, or does for the patient (left brain focus). Rather, the key mechanism is *how to be with the patient*, especially during affectively stressful moments when the patient's subjectivity is dis-integrating (right brain focus).

Bowlby stated that attachment behavior was based on the need for safety and a secure base. We have demonstrated that attachment is more than this; it is the essential matrix for creating a right brain self that can regulate its own internal states and external relationships. Attachment intersubjectivity allows psychic structure to be built and shaped into a unique human being. Our task as therapists is to understand and facilitate this developmental process with our clients of all ages. As Clinical Social Workers we do this in the wider context of the culture and society. Regulation theory enhances and deepens the field's bio-psycho-social-cultural perspective.

#### Conclusion: Modern Regulation Theory

An explosion of developmental and neurobiological research has added substantially to theoretical understanding in the 110 years since Freud (1895) first published his *Project for a Scientific Psychology* (Schore, 1997). Having been grounded in drive, ego, object-relations, self and relational psychology through the 1980s, the addition of attachment theory has moved

psychodynamic clinician's sensibilities into an awareness of real experience and a keen focus on early development as the root of all. Then, beginning in the 1990s, the advances in neuroscience, along with the temperament research, added the biological component in our biopsychosocial frame, thereby providing a remarkable underpinning and expansion of all the pertinent developmental psychoanalytic theoretical concepts that came before. Using this knowledge on a daily basis, finding new understandings in clinical assessments, shaping therapeutic interventions from relevant theory, and providing a unique awareness of the adaptive nonconscious functions of the implicit self are some of the profound results of this theoretical integration.

Thus, we are proposing the concept of Modern attachment/regulation theory as an amalgam of Bowlby's attachment theory, Freud's ideas about unconscious receptivity, updated Kleinian models of internal object relations and projective identification, self psychology's selfobject regulation functions, and contemporary relational theory, all informed by neuroscience and infant research. This is a profoundly developmental approach. We understand any individual's personal trajectory of emotional growth, including the development of his/her unconscious, to be facilitated or inhibited by the context of his/her family and culture. Attachment outcomes are thus the product of the interactions of both nature and nurture, the strengths and weaknesses of the individual's genetically encoded biological predispositions (temperament) *and* the early dyadic relationships with caregivers embedded within a particular social environment (culture).

The developmental understanding that arises from this theory leads to a corresponding Modern attachment/regulation Theory of Therapy. We know the effects of stressors on the self system, from mild and "ordinary" peculiarities that create and shape individuality, to severe trauma and neglect that interfere with and derail normal development and that require long-term

therapeutic involvement to get back on track (Schore, 1994, 2002a, 2002c, 2003b, 2005b, in press). This therapeutic approach is rooted in a consciousness of early dyadic regulation, a thorough knowledge of right hemispheric emotional development, and a deep understanding of the dynamics of implicit procedural memory. Awareness of the right brain mechanisms that underlie bodily-based, non-verbal communication is essential in this approach. A keen apperception of one's own somatic countertransference is a key element in the intersubjectivity between therapist and client.

A substantial amount of scientific and clinical research now strongly supports the fact that the therapeutic relationship can repair damage and create new structure that is more able to cope with the demands of life. Modern attachment/regulation theory explains how the therapist's participation in "external" affect regulation supports the emergence of more complex "internal" regulatory capacities in the patient. The psychotherapeutic process is based on the same developmental psychobiological attachment mechanism and can act as a growth facilitating social environment that can promote the development of not only an "earned secure" attachment, but an expansion of the patient's right brain, the biological substrate of the human unconscious.

The regulation model of modern attachment theory has implications not only for social work's important role in the psychotherapeutic treatment of individuals, but also for the culture, an area of prime interest to social work. Tucker (1992) observes: "the baby brain must begin participating effectively in the process of social information transmission that offers entry into the culture" (p. 79). He asserts that social interaction that promotes brain differentiation is the mechanism for teaching "the epigenetic patterns of culture" (p. 122), and that successful social development requires a high degree of skill in negotiating emotional communication, "much of which is nonverbal" (p. 80). Tucker concludes that such emotional information engages

“specialized neural networks in humans, within the right hemisphere” (p. 80). These data clearly imply an important role for Clinical Social Work in infant mental health and optimal right brain development, that is, attachment programs of prevention and early intervention. The field could make important contributions towards the creation of more emotionally intelligent future cultures.

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