

**Co-constructing inner and relational processes: Self and mutual regulation in infant research and adult treatment**

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Abstract In the current climate of theoretical change, psychoanalysis is seeking a theory of interaction. We propose that principles of interactive organization documented in infant research have analogues in adult treatment. A systems model of the integration of self and mutual regulation is used to draw analogies, but not one-to-one correspondences, between infant research and adult psychoanalysis. We specifically address how self and mutual regulation impact on each other, arguing that internal and relational processes are simultaneously organized, in relation to each other, at all developmental levels.

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Psychoanalysis has tended to privilege inner state as the focus of inquiry. Freud (1923) argued that perceptions of what goes on in the environment are never as important as those arising from within; that internal perceptions are more primordial, more elementary than perceptions arising externally, and that they have greater economic significance. Perceptions of the outer world are often seen as distorted through projections of the inner state.

Instead, we suggest that the "inner" and the "outer" worlds are co-constructed, and thus are not separate domains. We distinguish between the two domains, but see them as fundamentally coordinated. By not privileging "inner" or "outer", and by emphasizing their reciprocal co-construction, we examine how dyadic process may (re-) organize both inner and relational processes, and reciprocally, how changes in self-regulation in either partner may alter the interactive process.

In the past decade, efforts at conceptualizing systems views have been evident in both infant research and psychoanalysis. Each field, however, has come from the opposite bias. Heavily preoccupied with interactive regulation in the dyad, infant research on social development is only now seriously examining self regulation (see Tronick, 1989; Fox, 1994; Thompson, 1994). Similarly, psychoanalysis originally explicated the organization of inner states, and has only more recently seriously examined interaction in the dyad.

Current versions of systems thinking conceptualizing interaction in psychoanalysis can be found, for example, in Stolorow, Atwood, and Brandschaft's (1987) intersubjectivity, Mitchell's (1988) relational psychoanalysis, Hoffman's (1983) and Gill's (1994) constructivist views, Aron's (1996) mutuality, Lichtenberg's (1989; Lichtenberg, Lachmann, & Fosshage, 1992) placement of five motivational systems within a mutual regulation model, Benjamin's (1988;1990) intersubjectivity, Ehrenberg's (1994) intimate edge, and Beebe, Jaffe, and Lachmann's (1992) dyadic systems model. These theorists all have in common the attempt to refine conceptualizations of psychoanalytic interaction. Systems thinking has also been implicit in much twentieth century psychoanalysis. For example, Ferenczi (1928), Balint (1968),

Fairbairn (1952), Winnicott (1965), Sullivan (1953), Bowlby (1969), Loewald (1960), and Kohut (1984) all in different ways emphasized the interactive process in psychoanalysis, the relation of the observer to the observed, and the contribution of the dyad.

Whereas the self and the object are richly conceptualized in psychoanalysis, the dyadic system is not. Infant research has defined principles of organization in dyadic systems that may have analogues in adult treatment, although the issues being regulated in the two arenas are not necessarily similar. In our previous work we defined a dyadic systems view integrating self and interactive regulation (Beebe, Jaffe & Lachmann, 1992; Beebe, Lachmann & Jaffe, 1997), and we defined three principles that organize infant representations and internalization: ongoing regulations, disruption and repair, and heightened affective moments (Beebe & Lachmann, 1994). These principles were also applied to an adult treatment case (Lachmann & Beebe, 1996). Here we broaden and deepen the foundation of our systems view, elaborating in detail on the integrations of self- and interactive regulation.

First we briefly review our systems model. Next we turn to infant as well as adult research to identify mechanisms for the reciprocal coordination of inner and relational processes. The various ways in which inner state and interactive process have been found to be linked can be seen as organizing principles of the integration of self and interactive regulation. To illustrate these organizing principles we interweave vignettes from infant research and adult treatment, drawing analogies between the two arenas. We conclude with a statement of these general principles for a theory of interaction at the nonverbal level. Although our focus will be on the nonverbal, procedural level, these ideas are relevant to the verbal level as well.

### **I. A systems view**

In a systems paradigm the organization of the dyad is an emergent property. A theory of interaction must specify how each person is affected both by his own behavior, that is, "self regulation," as well as by the partner's behavior, that is, "interactive regulation" (Thomas & Malone, 1979; Thomas & Martin, 1976). Each person must both monitor the partner and regulate inner state.

Thomas and Martin made this critique in the late 1970's in reaction to the prevailing tendency to focus on interactive regulation to the neglect of self regulation. Advances in statistical methods in the late 1970's and early 1980's, particularly in the application of time-series methods to the behavioral sciences, facilitated the use of the approach advocated by Thomas and Martin (Gottman, 1981; Gottman & Ringland, 1981; Chatfield, 1982; Bakeman, Adamson, Brown & Eldridge, 1989; Capella, 1991; Warner, 1988; Badalamenti, 1990, 1992). In infant research, the two theorists at the forefront of the application of this approach have been Sander (1977, 1985, 1997) and Tronick (1989; Gianino & Tronick, 1988), who have argued that self and interactive regulation are concurrent and reciprocal processes, each affecting the success of the other. These processes of self and interactive regulation are simultaneous, complementary, and optimally in dynamic balance, with flexibility to move back and forth. The integration of self and interactive regulation relates the individual to the dyad and provides one definition of the dyadic system. *Although this theory is now well articulated, neither infant research nor psychoanalysis has yet taken full advantage of its implications.*

Studies of interactive regulation and self regulation have tended to exclude each other. It is essential to integrate them, however, since each impacts on the other. Further-more, they address different aspects of clinical problems, and either or both may be misregulated in each partner. To illustrate, in the study of disordered interactions in infancy, there has been a tendency to locate the source of difficulty in one partner or the other, for example, in early infant self-regulatory difficulties, or in maternal intrusion, rather than to disentangle the relative contributions of self- *and* interactive regulation of *both* partners.

### Systems Views

Influenced by biological systems theory, and particularly by Paul Weiss (1970), Sander (1977, 1985) introduced systems thinking into infant research, suggesting that the organization of behavior be viewed as the property of the mother-infant system as well as the property of the individual. Systems views of early development have been strongly influenced by the work of Piaget (1954), Werner (1948), and Kohlberg (1981), and have been further elaborated by Sameroff (1983) and Emde (1988). In recent work Sander (1995) distinguishes between “being together-with” and being distinct from. Being together-with has been documented, for example, in the microsecond bi-directional responsivities of Trevarthen’s (1979) “primary intersubjectivity” and Stern’s (1971,1985) “split-second world”. “On the other hand, the...requirement that the infant as a living organism be *self*-regulating and *self*-organizing necessitates recognition in the system of the *agency* of the infant to initiate action toward these ends”..., setting the stage for the “sense of self as agent” (Sander, 1995, p. 588). Sander considers both the awareness of one’s own inner experience of self as agent, and the awareness of one’s engagement with the world, to be essential lifelong processes.

Fogel has defined communication in a systems model as transaction, rather than action and reaction. Discrete signals can be interpreted only in the context of the behavioral flow constructed by both partners (Birdwhistell, 1970; Fogel, 1992 a&b, 1993; Schefflin, 1973; Sameroff, 1983). Fogel (1992b) beautifully described this system as “co- regulation”: all behavior is simultaneously unfolding in the individual while at the same time continuously modifying and being modified by the changing behavior of the partner. It is a model of continuous reciprocally evoked mutual regulation, where communication does not reside “in” either partner, but is continuously constructed by both. Fogel (1992a,b) has argued that one’s emotions and expressions are not discrete entities encased in the individual. Instead, they are socially constructed out of the fabric of present interactions, as well as those of the past. Stern (1989) has similarly argued that a relationship pattern resides in the dyadic system, not in the individual.

Studies by Tronick and Cohn provide illustrative empirical data on the systems view. Tronick (1989; Gianino & Tronick, 1988) has shown that self and mutual regulation are highly correlated. The still-face experiment, in which the mother is instructed to maintain an immobile face, can be considered a test of the infant’s self regulation and coping capacities in a social stress situation. Infants who self regulate more adaptively in the still-face experiment, by continuing to try to engage the mother, have a better mutual regulation with the mother in ongoing play than infants who self regulate less adaptively (for example, arch away or give up postural tonus). Examining the details of the ways infant self-regulate and cope in the still-face experiment at six months, Cohn, Campbell & Ross (1991) document that infants who continue to use positive expressions and bids for engagement are more likely to be securely attached at one year than infants who use other modes of coping in the still-face situation.

Further empirical work illustrative of a systems view comes from a balance model of self and interactive regulation, based on a large study of mother-infant vocal rhythm coordination in face-to-face interaction at four months, and the prediction of 12 month attachment outcomes (Jaffe, Beebe, Feldstein, Jasnow & Crown, 1998; Jaffe, Feldstein, Beebe, Jasnow, Crown, & Fox, 1991). A continuum of interactive regulation, ranging from high vocal rhythm coordination (vigilant) to low (withdrawn), predicted 1 year attachment outcomes. Midrange interactive coordination predicted secure attachment, whereas scores outside the midrange predicted insecure.

Building on these findings on interactive regulation, Beebe & McCrorie (1997) added self regulation to the model and hypothesized a midrange optimum in both. This balance model also drew from Tronick's (1989) description of the origins of psychopathology in infants of depressed mothers. He documented that various failures in interactive regulation in these dyads, without repair, were followed by infants' preoccupation with self regulation of distress states on their own. The balance model posits that in the midrange, interactive coupling is present but not obligatory, and self-regulation is preserved but not excessive. Optimal social communication and development is hypothesized to occur with flexibility to move between self and interactive regulation, yielding relatively optimal levels of infant attention, affect, and arousal.

For each partner, operating outside the midrange may index an attempt to cope with a disturbance in the interaction (see also Malatesta, Culver, Rich & Shepherd, 1989; Roe, Roe, Drivas & Bronstein, 1990; Tobias, 1996?). An excessive monitoring of the partner, at the expense of self regulation, defines one pole of imbalance, "interactive vigilance"; preoccupation with self regulation, at the expense of interactive sensitivity, defines the other pole of imbalance ("withdrawal" or "inhibition"). At each pole of imbalance we assume that the infant is struggling with non-optimal levels of attention, arousal and affect (Jaffe et al, 1997; Beebe & McCrorie, 1996).

Excessive self regulation at the expense of interactive regulation (withdrawal) is illustrated by Tronick's (1989) description of the infants of some types of maternal depression as preoccupied with self-comfort and self-directed regulatory behaviors (turning away, loss of postural control, oral self-comfort, self-clasping, and rocking), accompanied by lowered interactive contingencies. Excessive monitoring of the partner (vigilance) at the expense of self-regulation is suggested by the prediction of insecure attachment ("C" and "D") from the highest degrees of vocal contingencies, with presumably compromised self regulation (Jaffe et al, 1998; see also Sander, 1995).

#### Definitions of Self and Interactive Regulation

In the definition of interactive regulation, we use the terms "mutual", "bi-directional" and "co-constructed" regulation interchangeably. These terms do not imply "mutuality"; instead, they refer to the contribution that each partner makes to the regulation of the exchange. These terms mean that contingencies flow in both directions between partners. That is, the behavior of each partner is contingent upon (influenced by) that of the other. These terms do not imply symmetry: each partner may influence the other in different ways, to unequal degrees. Nor is a causal model implied: regulation is defined by probabilities that one partner's behavior is predictable from that of the other. Nor is a "positive" or "successful" interaction implied: aversive as well as positive interactions are bi-directionally regulated.

We draw in this paper on nearly three decades of infant and adult research documenting that, within the interactive process, each partner influences the other moment-by-moment (see Beebe et al, 1985; Beebe & Lachmann, 1988, 1994; Beebe, Lachmann & Jaffe, 1997; Tronick, 1989,

for reviews). Although this is one central way in which we use the terms bi-directional influence or co-construction, there is a second major use of this concept: the interactive process and the self regulation process each influence the other. This second use of the term “co-construction” is the subject of this paper.

We use the term self-regulation to denote the capacity of the partners to regulate their respective states. Newborn infants begin life with capacities to regulate both endogenous states as well as environmental stimuli (Als, Duffy, McAnulty, Badian, 1989; Sigman, Beckwith, Cohen, Parmalee, 1989). Constitutional and temperamental differences feed into early self regulatory capacities. Infant self regulation refers to the regulation of arousal, the maintenance of alertness, the capacity to dampen arousal in the face of overstimulation, the capacity to inhibit behavioral expression, and the capacity to develop predictable behavioral cycles. It includes variations in the readiness to respond and the clarity of cues (Korner, 1976). Self touching, looking away, and restricting the range of facial expressiveness are examples of self regulation strategies which dampen arousal. In infancy as well as adulthood, self-regulation is a critical component of the capacity to pay attention and to engage with the environment (Freedman, Barosso, Bucci, & Grand, 1978). Sander (1983, 1985) suggests that, with the advent of symbolic functioning, self regulation includes access to, articulation of, and regard for inner states.

The newborn can be considered to be a "biologically social partner" (Als, Duffy, McAnulty, Badian, 1989, p.5), eliciting and seeking physiological, motoric, state, and attentional interaction with the environment. As Als (Als & Brazelton, 1981; Als et al, 1989) points out, development from the unicellular state onward occurs in a process of continuous interaction between organism and environment. Individual differences in these endogenous and social capacities affect the infant's self regulation as well as interactive regulation. Differences in self regulatory capacities affect the success of interactive regulation; conversely, differences in the nature of interactive regulation can facilitate or interfere with self regulation (see Beebe & Lachmann, 1994; Tronick, 1989).

#### A lifespan view of nonverbal communication

In infant research a systems model has been applied to the study of nonverbal communication. In our attempt to apply this research to issues in adult treatment, it is important to note that much of the organization of nonverbal communication remains similar across the lifespan. The capacity to enter into split-second, coordinated nonverbal exchanges is probably highly adaptive in evolution.

Micro-analysis of film has revealed that split-second responsivity occurs in facial-visual interactions of monkeys (Chevalnier- Skolnikoff, 1976) as well as those of mothers and infants (Beebe & Stern, 1977; Cohn & Beebe, 1990; Beebe & Cohn, 1998; Stern, 1971). The ethologist Eibl-Eibesfeldt (1970) filmed lovers on park benches and also showed split-second responsivity in flirting behavior through microanalysis of film.

A second example is found in the regulation of vocal rhythms during face-to-face interactions. There are startling similarities in the regulation of vocalizing, pausing and the turn exchange in mother-infant and adult-adult vocal rhythm coordination (Beebe, Alson, Jaffe, Feldstein & Crown, 1985; Badalamenti & Langs, 1990, 1992; Cappella, 1981, 1991; Crown, 1991; Jaffe & Feldstein, 1970; Jaffe et al, 1997; Langs, Badalamenti, & Thompson, 1990, 1996; and Warner, 1987,1988). For example, in adult-infant and adult-adult interactions, the durations of vocal pauses are matched, the degree of control of various vocal rhythms is matched, and there is bi-directional influence where each partner's vocalization and pause durations are predictable from that of the other (Beebe et al, 1985; Crown, 1991; Jaffe et al 1991, 1997). These

striking similarities suggest that there are important continuities in the timing of the communicative process across the life-span. The timing of the communicative process affects what it feels like to be with the other and contributes to the representation of self and other at every developmental level. Thus, some aspects of nonverbal communication operate similarly across the life span.

#### The application of infant research to adult treatment

We now turn to analogies, but not one-to-one correspondences, between infant research and adult psychoanalysis, to illustrate how self and mutual regulation impact on each other. First we briefly review infant as well as adult research illustrating the coordination of self- and interactive behavior to make our argument that internal states and relational states are simultaneously co-constructed. Organizing principles of the integration of self and interactive regulation emerge from this work. In section III we interweave vignettes from infant research and adult treatment to draw analogies between principles of regulation in the two arenas. These vignettes will describe (1) dyadic access to self regulation, (2) special self regulatory requirements for engagement, and (3) orientational aversion. Although our focus in this paper is on the nonverbal dimension of interaction, the argument is relevant to the verbal level as well. We do not evaluate the relative advantages or disadvantages of treatment using the couch vs. treatment conducted face-to-face: the work we review has relevance to both.

### **II. The co-construction of internal and relational processes: Illustrations from infant and adult research**

Internal processes and relational processes are inextricably coordinated, and are organized concurrently. Experiences of influencing and being influenced by the partner, as well as concomitant shifts in self regulation behaviors and arousal, are inherent in the very nature of the infant's as well as the adult's face-to-face communication and social information processing. Across development, interactive regulation re-organizes both inner and relational processes; reciprocally, changes in self-regulation in either partner alter the interactive process. This integration of self and mutual regulation is one way of conceptualizing the organization of experience. Infant as well as adult research studies are reviewed to illustrate this position.

Mechanisms linking the organization of inner and relational processes. Meltzoff (1985, 1990) has shown that infants as young as 42 minutes can imitate the facial expression of an adult model. The infant perceives the correspondence between what he sees in the face of the model, and what he feels proprioceptively in his own face. How can he do this? Through cross-modal matching. The infant can translate between environmental information and inner proprioceptive information, detecting matches, from the beginning of life. He can bring his internal state and behavior into a correspondence with the environment. Meltzoff argues that this cross-modal matching provides a fundamental relatedness between self and other, between inner state and environment. He suggests that it provides the earliest experience of "like me". Cross-modal perception of correspondances is one mechanism for coordinating inner and relational states. Although Meltzoff's demonstration is in the modality of facial expression, this principle can be extended to other modalities, such as correspondances of timing.

There is considerable adult evidence that certain regions of the two cerebral hemispheres are differentially lateralized for processing positive and negative emotional stimuli (Davidson & Fox, 1982). In studying infants, Davidson & Fox (1982) have shown that by 10 months the brain is likewise lateralized for positive and negative affect. As the infant watches a video of a laughing actress, his brain shows the pattern of positive affect (EEG activation of the left frontal

lobe). As the infant watches a video of a crying actress, his brain shows a pattern of negative affect (EEG activation of the right frontal lobe). Thus, the mere perception of emotion in the partner creates a resonant emotional state in the perceiver. Unlike the Meltzoff data, the infant does not have to actually match the partner's behavior to be affected by the partner's facial expression. What the infant perceives on the face of the partner alters his internal state, and the infant cannot escape the face of the partner. In this sense, internal state and interactive state are organized simultaneously. Schore (1995; see also Perry, 1996) has recently amassed extensive evidence showing that variations in the nature of the maternal stimulation influence the developing organization of the infant's brain.

The link between the perception of facial expression and brain activation patterns in the perceiver provides a second mechanism through which the emotional state of the partner and the emotional state of the individual are coordinated. The Davidson and Fox research goes further than the Meltzoff data by documenting the concomitant reorganization of activation in the frontal lobes, thus further specifying the regulation of inner state. Both mechanisms (documented by Meltzoff, and Davidson and Fox), operate at the nonsymbolic, procedural level.

Elaborating on Fox's work, Dawson (1992) applied this method to the study of depressed mothers and their infants. She showed that by 10 months the emotional responsivity of infants of depressed mothers is already organized differently from that of normal infants. The same event that activates a positive affect behavior and EEG pattern in normal infants (mother playing peek-a-boo, or mother returning after separation), elicits negative behavior and EEG pattern of activation in infants of depressed mothers. Again, interactive events and infant inner state are coordinated; but the infants of depressed mothers show a reversal of the usual organization.

Ekman, Levenson & Friesen's (1983) study of adults found that a particular facial expression is associated with a particular pattern of physiological arousal. Matching the expression of the partner therefore produces a similar physiological state in the onlooker. Thus a relational state, and an internal state, are simultaneously constructed. The Ekman work provides a third mechanism through which the emotional state of the individual can be transmitted to the partner, that is, specific matching of facial expressions. Like the Fox work, it specifies the nature of the internal regulation of state at the physiological level. We have previously argued that, as two partners match each other's affective (as well as temporal) patterns, each recreates in himself a psychophysiological state similar to that of the partner, thus participating in the subjective state of the other (Beebe & Lachmann, 1988).

Inner experience is organized in the interactive context. Sander (1977, 1983, 1985) has an extensive body of data demonstrating that inner experience is organized in the interactive context. Infant management of state maintenance and state transitions (between sleep and wake) was studied in the first weeks of life, particularly the infant's achievement of day/night organization and an expectable pattern of the temporal organization of the 24 hour cycle. A complex interplay was documented between infant self regulation and how mother and infant jointly negotiate the management of infant state transitions. Sander used this framework to propose that the capacity for inner experience exists from birth, and consolidates around the experience of recurring states, which the infant comes to recognize. Inner experience begins in an expectable sequence of arousal, waking up, being fed, open spaces for play, and so on. This inner experience is getting organized, or remaining more relatively disorganized, in the interactive context, through which the regulation of state occurs. As the infant encounters both matches and mismatches of his expectancies of how the interactive regulation of state transitions

will go, he becomes "aware" (at a presymbolic level) of his own states. The more regular the state periodicities, the more the infant can be aware of his states.

As a function of the particular quality and success of the mutual regulation of state, Sander argues that the infant-caretaker system constructs a unique facilitation of, and constraint on, the infant's access to and awareness of his own states, his initiative to organize his own states, his regard for his states, and his ability to use his states in organizing his own behavior. These unique facilitations and constraints eventually contribute in development to individual differences in 1) the person's ability to be aware, 2) what he is aware of, 3) how he uses it, and 4) how he feels about it. The potential pathology of the system is seen in a developing inability in the infant to be aware of his state, to be guided by that awareness, and to use his initiative to change his state; in essence, an increasing interference in the experience of agency with regard to his own states. Thus Sander's work provides another mechanism for the reciprocal coordination of inner and relational processes: the mutual regulation of the bio-rhythms of sleep/wake, activity, and feeding cycles.

Adult facial behavior is simultaneously communicative and self-regulatory The argument for the co-construction of inner and relational processes can be made with adult data as well. Behavior, physiological arousal, and subjective state are all organized concurrently and are aspects of the same phenomenon (Izard, 1971; Tomkins, 1962, 1963; Ekman et al, 1983; Adelman & Zajonc, 1989). All three are simultaneously organized in the interactive process. For example, there is now a substantial body of experimental adult literature demonstrating that facial action is simultaneously communicative and self regulatory, modulating physiological arousal and subjective experience. This research links facial action with internal state. It provides another body of data documenting that internal experience is organized hand-in-hand with interactive experience (see Adelman & Zajonc, 1989; Laird, 1984; Winton, 1986; Winton, Putnam, & Krauss, 1984).

Tomkins (1962, 1963) considered the face central, expressing emotion both to others and to the self, via feedback from the tongue and facial muscles, the sound of one's own voice, and changes in blood-flow and temperature of the face (see also Adelman & Zajonc, 1989). Changes in facial action are associated with subjective changes, either intensifying or inhibiting the experience of the emotion (Adelman & Zajonc, 1989; Izard, 1979; Ekman, Friesen, & Ancoli, 1980; Tomkins, 1962).

Ekman (Ekman et al, 1980) videotaped adult subjects while they watched films, and coded the subjects' facial actions. During a happy film, those subjects who showed greater positive facial action rated themselves as happier; during a negative film, subjects who showed more negative facial action reported more distress. Facial action can also influence subjective experience of emotion, even without awareness. In studies where spontaneous facial action was intensified without the subject's awareness, for example by using reinforcement, canned laughter, or the presence of an observer, self-reported emotion increased correspondingly (Adelman & Zajonc, 1989).

The mutual regulation model and a "dyadic expansion of consciousness" view of therapeutic action. Tronick (1989; 1996; Gianino & Tronick, 1988) has made a major contribution in conceptualizing the integration of self and mutual regulation processes. For example, he considers that the maintenance of an adequate internal regulation (homeostasis), such as the regulation of an infant's core body temperature, is a dyadic achievement. It is a joint product of exogenous and interactive processes. And each must come to know the state of the other if the regulation is to succeed (Tronick, 1996).

In the process of mutual regulation, Tronick (1996) has suggested that each partner (mother and infant, or therapist and patient) affects the other's "state of consciousness" (state of brain organization). As each affects the other's self regulation, each partner's inner organization is expanded into a more coherent, as well as a more complex, state: "...each individual is a self-organizing system that creates its own states of consciousness--states of brain organization--which can be expanded into more coherent and complex states in collaboration with another self-organizing system" (Tronick, 1996, p.9). In this process, each partner's state of consciousness expands to incorporate elements of consciousness of the other, in a new and more coherent form. Since both partners are affected by this process, there is a "dyadic expansion of consciousness" into a more coherently organized and complex state of dyadic consciousness (Tronick, 1996, p.13). He suggests that this process describes a view of therapeutic action: both analyst and patient create and transform unique dyadic states of consciousness through mutual and self regulation.

We now turn to case studies of infant as well as adult research, and vignettes of adult treatment, to illustrate the complex interface between self and mutual regulation for both partners as they co-construct their experience together.

### **III. Dyadic Access to Self Regulation**

#### **Dyadic Access to Infant Self Regulation and State Transformation: Video illustration in a 5 week infant.**

Face-to-face play is the research paradigm used to study social communication in early infancy. Mothers are asked to play with their infants as they would at home. The infant is seated in an infant seat. Two cameras coordinate a close-up of each partner's face into one split-screen view. Five to six week old infants are very hard to film in the face-to-face interaction set-up. They have normal self-regulatory difficulties and over-arouse easily. When comforted, they frequently slide right through the arousal continuum into sleep.

Video illustration of Elliott at five weeks We have previously described Elliott at five-weeks, who plays sequentially (without a break) with three different partners, his mother, a graduate student, and the first author, for approximately two minutes each (Beebe, Lachmann & Jaffe, 1997). With each partner the infant has a different access to his self regulatory capacities and different capacity to engage in the interaction. With his mother, who is a little tentative and flat, Elliott is fussy and does not make eye contact. This is a normal range of self regulation difficulty for a five week old. The mother has no vocal prattle or facial play, and instead she jiggles the infant in a rapid rhythm. When the mother hits upon the strategy of singing "Happy Birthday", the infant's eyes suddenly change from unfocused to alert, he makes eye-contact, and the mother smiles for the first time. But she seems to have no other strategies, and when she sings "Happy Birthday" again, Elliott is less interested, and the mother cannot regain his engagement.

The graduate student who is being trained to play with babies has a greatly animated face, but she does not match the baby's affect. She smiles widely, while the infant is sober with slight frowns, so that this interaction does not work well either. She then picks the infant up and holds him more upright, which facilitates his self-regulation, and there is a brief moment of mutual visual engagement. Then the infant begins to cry.

As the last partner, I (Beebe) begin by vocally matching the baby's cry rhythm. Eventually, I slow the rhythm, and lower my volume, and the baby calms right down with me (see Stern, 1985, for a similar description). He then becomes alert and visually engaged. Gradually, however, he becomes sleepy. I provide more stimulation with animated faces, but keep the volume down. He

looks for a while, but then becomes sleepy again. I then begin a faster rhythm with my face, voice, and head, but keep the volume low. The infant becomes visually engaged, making small opening movements with his mouth.

This series of three interactions illustrates variations in the self-regulatory ability that the baby brings, variations in the attunement of the partners, and the dyad's ability to use what capacities the infant brings. The degree of engagement (as well as distress) in an interaction is an emergent dyadic phenomenon. The balance between self and interactive regulation shifts across the three interactions, from more preoccupied with self regulation in the first two, to a better balance in the third. Matching Elliott's cry rhythm in the third interaction brought adult and infant into similar states, facilitating a further interactive regulation, helping Elliott dampen his arousal.

Analogy to Adult Treatment. We can conceptualize similar issues in adult treatment. What self-regulatory range does the patient bring, and what capacity does this particular therapist and patient together generate to gain access to the patient's self-regulatory range, and to expand it? With a different therapist, a particular patient may have access to a very different portion of his own self-regulatory range. Similarly, with different patients, therapists have different access to their own self-regulatory range.

The nature and range of the patient's self regulation that is available over the course of a treatment will depend on the quality of the interactive regulation and the styles of engagement and self-regulation that both partners bring. Does the therapist envision the analytic task as matching and tracking the patient's attention and affect state ("joining"); stimulating and dampening the patient's affect and arousal ("altering"); or keeping a steady, relatively unvarying level of attention and affect ("neutrality")? And how do patients respond to these different styles? What of the patient's implicit (unconscious) interactive goals (making sure the therapist does not intrude; needing the therapist as a benign background; obtaining love and approval; attempting to find the therapist's own need for the patient, etc), and the therapist's response? In each pattern interactive regulation and self regulation will be different, for each partner. These differences, and their implications for therapeutic action, are in dire need of study.

In the following case the therapist began by attempting to track and join the patient's affect, attention and arousal; later in the treatment the therapist provided the option of a more stimulating interaction.

Dyadic access to an adult patient's self regulatory range.

We have described the treatment (by Lachmann) of Karen who began psychoanalytic psychotherapy after she attempted suicide by taking all the pills in her medicine cabinet (Lachmann & Beebe, 1996). Like an automaton, she watched her actions "from a bird's eye view from a corner of the room," as though she were "behind a pane of glass." She dreaded conversing with her therapist, feeling she had nothing to say, mechanically asking, "what shall we talk about?" We came to understand that she anticipated having to regulate all her difficult feelings on her own, by herself.

Karen brought a narrow self regulatory range: an immobile face, a tendency to space out, and massive efforts to dampen her reactivity. She sat with her coat on, not looking, saying in a flat voice that she had nothing to say. In treating Karen, I (Lachmann) responded to her constriction by partially constricting myself, narrowing my own expansiveness in order to more closely match her range. Partially out of awareness, her facial, vocal, visual, and orientational behavior created a resonant emotional state in me. I kept my voice soft, avoided asking questions, stayed within a moderate range of animation, and did not insist on her associations or verbal participation. Gradually over many months her tolerance for arousal increased. She began to

talk with more color and contour in her voice about more personal things. In this way her almost exclusive reliance on drastic self regulation through withdrawal and depersonalization began to shift. Karen had influenced my activity and in turn was influenced by it, although this process was never verbalized.

Although I was not unaware of monitoring my responses, I was not following a plan of nonverbal treatment. It was mostly in retrospect that I became aware of the salient role played by the nonverbal dimensions of the interaction. When the treatment began, solitary self regulation was Karen's main method of survival and it was failing, illustrating an extreme imbalance in the system toward a preoccupation with self regulation at the expense of interactive engagement. The treatment attempted to engage and expand her self regulation so that it could be included in a dialogue, illustrating Sander's concept that each dyad constructs a unique access to, awareness of, and regard for inner states. Gradually this approach was integrated with interpretive work as well.

#### Self regulatory access to mutual regulation in an adult patient

This case vignette of Paul (treated by Beebe) is taken from the 9th year of a 13 year, three times per week analysis in which the patient sat up. Paul was a severely schizoid man in his mid-thirties. His father was a successful business man who was emotionally abusive to his wife and children. The mother was depressed and alcoholic. The central nurturing figure for Paul had been the grandmother.

In the first seven years of treatment, Paul could barely participate beyond showing up for his appointments. Major events in his life were not disclosed. Although he had severe difficulties with his long-standing live-in girlfriend, he could not discuss them. Paul gradually began to describe a recurrent sense of despair that he could not become more alive. Only after he left his girlfriend did he reveal that he had been sexually abusive to her. He had been too ashamed to talk about his relationship with her because it would have meant discussing his fear that he could not love. He told me that, in retrospect, if I had not continually reached for him in the early years of the analysis, while tolerating his disengagement, he would have been a "goner."

Although in the ninth year the treatment was progressing well, a major self regulatory disturbance temporarily prevented further movement. I noticed a repetitive interaction across several different topics in which Paul's face was animated, involved, and smiling. However, he reported feeling nothing. At first I was so affected by the animation I saw in his face, and my own response to it, that I had difficulty believing that he experienced absolutely no feeling. In retrospect, my perception of his positive animation created a resonant positive emotional state in me.

The possibility was investigated that Paul felt too frightened to feel pleurably involved. Further discussion revealed a more complex picture, however. He described an internal state of "steel doors clanging shut, becoming tightly sealed". I shifted my attention to an investigation of this tightly sealed inner state. Pursuing evidence of a shut-down, from his associations I hit upon the idea of asking him to take his pulse. He counted out the beats and it was about 40 per minute. Although he was somewhat athletic, he had nevertheless drastically dampened down his arousal, in an extreme self regulatory measure, shutting himself down so that he would feel nothing. This self regulatory strategy had evidently become "unhooked" from his animated facial responsiveness. He could participate in a seemingly normal related way. And yet, anything that happened between us could not affect his internal state. In retrospect, I had had such difficulty grasping this strategy since it ran counter to my expectation that his facial display would be more directly associated with his physiological arousal. However, Ekman's (Ekman,

Friesen & Ancoli, 1980) work on “display rules” suggests that Paul had learned not to “display” on his face the emotion he was feeling, that is, sealed shut.

Paul’s strategy of drastically dampening his arousal had interfered with his ability to experience our relationship on an affective-arousal level. Thus the mutual regulation was also profoundly disturbed by this extreme self regulatory measure. Our increasing ability to describe this strategy gradually fostered the promotion of less extreme self-regulatory strategies and an enhanced capacity for enlivened engagement with me, illustrating Sander’s concept that a new dyad can construct a unique facilitation of, awareness of, and ability to use inner states.

#### **IV. Special Self Regulatory Requirements for Engagement**

##### **Special Self Regulatory Requirements for Engagement in Avoidant Attachment Infants, and Subsequent Disturbance of Mutual Regulation as Toddlers**

Having illustrated normal self-regulatory difficulties in the case illustration of 6 week old Elliott, we now turn to a study by Koulomzin (Koulomzin, 1993; Koulomzin, Beebe, Jaffe & Feldstein, 1993) that investigates the self regulatory process of four month infants in more detail. Special self regulatory requirements were identified in those four month infants whose attachment in the Ainsworth separation paradigm was classified at one year as insecure-avoidant (N=8), as compared to secure (N=27). We refer to these four month infants as "secure" or "insecure", understanding that they are at four months in the process of becoming secure or insecure, a classification which cannot be made by the Ainsworth paradigm until 12 months.

Based on the work of Bowlby (1969) and Ainsworth (Ainsworth, Blehar, Waters, & Wall, 1978) current infant research evaluates attachment in the laboratory by separating mother and infant, and then evaluating their reunion. "Secure" infants are very upset at the separation, but are easily comforted by the mother upon her return and can return to play. "Insecure avoidant" infants may seem unaffected by the separation, tend to avoid the mother at reunion, and remain involved with the toys. Although further insecure subtypes can be discriminated, in this study only secure and avoidant infants were examined.

Using videotape microanalysis of mother-infant face-to-face play at four months, infant gaze, orientation, self-touch and facial behavior were coded second-by-second. Secure infants at four months tend to look at the mother while holding their heads in a stable en face orientation. The avoidant infant at 4 months looks at the mother less, while holding his head at a slight angle, as if “cocked for escape”. Only if engaging in tactile self-comfort, such as fingering or rubbing the body, clothing or a strap, can the avoidant infant look at the mother as much as the secure, and maintain a stable en face orientation. Otherwise, without tactile self comfort, the avoidant infant looks at the mother half as much as the secure infant. Thus, tactile self comfort is a special self regulatory requirement for mutual gaze and stable orientational engagement at four months in the avoidant infant.

Facial affect is also relevant to the infant's capacity to maintain focused attention. Avoidant and secure infants do not differ when affect is neutral or negative. When affect is neutral, both avoidant and secure infants can maintain stable orientation and gaze. When affect is negative, both avoidant and secure infants exhibit a disruption of the attentional focus so that gaze at mother no longer constrains the head to stay en face. However, in the context of positive affect, avoidant and secure infants differ. Positive affect disrupts attentional focus in avoidant infants, such that looking at mother no longer constrains head movement to an en face orientation. Instead, when positive, avoidant infants are "cocked for escape", with their heads more likely to

go into an upward, downward, or major avert orientation. In contrast, positive affect does not disrupt stable en face orientation and gaze at mother for secure infants.

This research demonstrates that internal state regulated through self touching, and relational state regulated through mutual gaze and stable vis-a-vis orientation, are simultaneously co-constructed. In the avoidant infant, a special self regulation strategy plays a critical role in the capacity to sustain engagement. This work provides a particularly dramatic illustration of the idea that neither the nature of the interactive regulation, nor that of the self regulation, can be understood apart from the other. And an avoidant attachment climate skews both.

Although the data on the mothers of these infants has not yet been analyzed, we speculate that the mothers will show differential responses to the secure infants who can display positive affect while maintaining a stable en face orientation, vs. the insecure infants who display positive affect while cocked for escape. We also speculate that we will be able to identify the other half of the reciprocal influence equation, that is, what the mothers of the secure vs. insecure infants may be doing differently, that may influence these infants to behave differently.

#### Two year follow up: Subsequent disturbance of mutual regulation

These same 35 infants were videotaped with their mothers in face-to-face play with toys at two years by Sarro, Goldstein, Zicht, Anderson, Beebe & Jaffe (1993a,b). For both mother and infant, vocalization, gaze, and manipulation were coded second by second, identifying whether attention was on an object, the partner, or object-plus-partner. The ability of toddlers to coordinate their attention to both a person and an object is a milestone of cognitive and social development. As the developmental heir to the early infant's face-to-face play, this ability is related to communicative competence and symbolically mediated conversation.

Across the group, irrespective of attachment classification, robust mutual regulation of attentional focus on a moment-by-moment basis was demonstrated: there were as many findings of mothers influencing toddlers as the reverse. Over the group, toddlers were most responsive to mother in the modalities of vocalization and gaze, and mothers were most responsive in gaze. Examining possible differences between the secure and insecure-avoidant groups, both secure and avoidant toddlers and their mothers were similarly mutually responsive to each other's gaze behavior. However, whereas all secure toddlers were responsive to mother's vocal behavior, avoidant toddlers manifested no responsivity in any modality to the mother's vocal behavior. These are the same infants who, at four months, had to do self-regulatory self-touching in order to sustain visual engagement with mother. Thus the self-regulatory disturbance at four months predicts insecure attachment at one year, and is followed by a disturbance in responsivity to mother's language at two years. A critical aspect of interactive regulation has been skewed.

The insecure-avoidant toddler is thus unresponsive to the mother's vocal attentional focus, markedly altering the context for language acquisition. We suggest that, as a consequence, the insecure toddler's developing language will not be imbued with the same level of dyadically shared meaning (Harris, 1993). In speculating about the transformational consequences, will this adult's experience of language, his associative web, his ability to track the language of the analyst, be altered? Will this person's language be less object-related? Will he have a lessened ability to use language within the dyadic context for relational purposes?

For her part, the mother of the insecure-avoidant toddler showed responsivity in twice as many of the gaze analyses as the mother of the secure toddler. For example, the mother of the avoidant toddler was twice as likely to shift her gaze to match her infant's visual focus on an object, to sustain her gaze while both looked at an object, or to shift her gaze into a mutual gaze encounter with her infant. Thus the mother of the avoidant toddler can be described as vigilant

in comparison with the mother of the secure toddler. This finding may indicate an imbalance in the adaptation of the mother of the avoidant toddler, shown in her tilt toward interactive regulation. Recalling the balance model of self and interactive regulation presented above, in the four month infants of the Koulomzin study, the balance shifts toward a preoccupation with self regulation. In the mothers of the avoidant toddlers, the balance shifts toward a vigilant interactive regulation, a heightened level of monitoring the partner, and presumably a sacrifice of access to inner state (Sander, 1985).

When the mother and infant are viewed as a system, each can be seen as responding to the other. To what degree is the mother of the insecure toddler compensating for her toddler's lack of vocal responsivity by providing more gaze responsivity herself? And to what degree is the insecure toddler less responsive as a reaction to the mother's higher levels of contingency? And/or, to what degree is the avoidant toddler's absence of responsivity to the mother's vocal attentional focus a continuing index of disturbances already evident as early as 4 months?

We assume that all self regulatory strategies are adaptive attempts to compromise between the needs to maintain engagement with the partner and the needs to protect organismic integrity by keeping levels of arousal within tolerable ranges. Thus, the avoidant infant's self touching is highly adaptive since this strategy enables the infant to look at the mother for as long as the secure infant. However, it may also be costly, in deployment of energy and attention. If not using a strategy of self touching, the avoidant infant can use a strategy of cocking the head while looking at the mother. This latter strategy has the quality of simultaneous approach and avoid, whereas self-touching enables the infant to maintain en face engagement comparable to that of the secure infant.

The finding that positive affect disturbs the avoidant infant's ability to maintain a stable vis-a-vis orientation to the mother is fascinating. We assume that the heightened arousal of positive affect is difficult to manage for this infant. Again there is a simultaneous activation of approach through positive affect, and of withdrawal through the head "cocked for escape". As shown by Field (1981), looking away is a potent method of decreasing arousal.

Implications for adult treatment Koulomzin's finding that during positive affect the avoidant infant's head orientation is no longer stable may be relevant to adult treatment. For both Avoidant Attachment infants and some adult patients, positive affect may be over-arousing, indexing a self regulatory difficulty. If the head is cocked, ready to avert, positive affect will be experienced differently by both partners. We suggest that the patient's own experience of positive affect will be problematic if his orientation is cocked for escape, probably associated with a different pattern of arousal than positive affect in a vis-a-vis orientation. We also suggest that the analyst's experience of the patient's positive affect will be altered by a head orientation which is slightly askew. The patient who is looking and positive but with a slightly averted orientation may seem seem "ambivalent", "wary", or "coy."

These are nonverbal patterns which can be observed in the consulting room. They may be picked up by the analyst out of awareness and yet inform the analyst's verbal and nonverbal interventions. We would like to use the details of these nonverbal regulations to refine the analyst's capacity to notice moment-by-moment self regulatory attempts. These are rooted in adaptive efforts to compromise between the needs for engagement with the partner and needs to maintain one's own organismic integrity (arousal in a comfortable range). We are not interested in pathologizing these interactions nor necessarily drawing them into one interpretive system or another. When a patient comes with a history of disruption of engagement, these moment-to-

moment shifts in self regulatory strategies can inform both patient and analyst as to what kinds of compromises have been and continue to be necessary.

These experiences are often very difficult to put into words. The patient may not be quite aware of them. The aspects of their history from which these behavior are derived are also likely to be out of awareness. If the analyst can "read" the nonverbal communications, based on the ongoing stream of behavior in both the patient and herself, they have the potential to alert her, often well before the verbal process can, to subtle difficulties in the engagement. Once the nonverbal communication is decoded, usually much investigation will be necessary to understand the history and meaning. Subtle nonverbal communications are particularly powerful because they occur in the here and now of the interactive matrix. Thus they possess that special alive quality of something immediate for both. They have important implications for both the immediate therapeutic relationship as well as the patient's history.

We are also interested in the mother of the avoidant toddler who is twice as responsive in her gaze behavior to her toddler as the secure mother. As we noted above it is impossible to know the degree to which the avoidant toddler's lack of responsivity to mother's vocalizations is (partially) a response to the mother's hypercontingency in gaze, and/or conversely the degree to which the mother's hypercontingency in gaze is a compensatory vigilance in an effort to reach an avoidant child. From the latter point of view, one could view this maternal strategy as playing to the avoidant infant's strength, since he remains as visually responsive as the secure infant. If so, the mother's hypervigilance in gaze might facilitate the interaction. However, it may also be intrusive, and these two possibilities cannot be distinguished in these particular data. Nevertheless, the avoidant toddler's lack of responsivity to mother's vocalization is an index of an interactive system which has already been shown to be aberrant at 4 and 12 months.

By the time this toddler grows up and appears in our consulting room as an adult patient, the contributions of both partners are represented in an expectation of dyadic misregulation. Making an analogy between the analyst and the hypervigilant mother of the avoidant toddler, compensatory vigilance is a common response to a patient who is difficult to engage. However, that very vigilance may in itself disturb the interaction. It may be experienced by the patient as intrusive, shadowing, or suffocating. In other kinds of patients, however, the analyst's compensatory vigilance may be experienced as a lifeline: someone is looking, watching, and noticing everything.

#### Special Self-Regulatory Requirements for Engagement in an Adult Patient

We now turn to an adult treatment case where the issue of special self regulatory requirements for engagement was a salient organizing principle of the treatment. We illustrate the therapist's task of becoming aware of and decoding the nonverbal communication, through her own behavior and that of the patient, as well as the investigation of the history and meaning of the behavior.

Jennifer (treated by Beebe) is in her 15th year of treatment, the first half of which occurred on a five times weekly basis, and the second half two or three times weekly. She sits up but never looks at me. Her head is down, her curly hair partially covers her face, and she has nothing to say. She keeps her arousal inhibited, rarely moving or shifting. She keeps her coat by her side on the floor in order to be able to leave quickly at the end of the session.

Jennifer's mother was depressed and rarely got out of bed. In the course of the treatment, a model scene (Lichtenberg, Lachmann, and Fosshage, 1992) was constructed. Jennifer was jubilant that her mother visited her in nursery school. One day she and her mother were in the school yard at the swing. As her mother pushed her higher, she felt that she was the "queen of

the school." Suddenly, her mother abruptly departed, leaving Jennifer crestfallen. Jennifer resolved that she would rather be home with her mother and refused to return to nursery school.

A second model scene of abandonment also emerged. At home, the mother would frequently close off her "wing of the house," locking it with a movable wall. Jennifer would lie on the floor on her side of the wall for hours, often crying, and her mother never came. "I was so left alone, I wasn't sure if I was alive or not."

Unlike the Koulomzin finding where it is the infant who breaks the mutual gaze at the moment of heightened positive arousal, in Jennifer's history it was the mother who broke the contact at such a moment. The moment of heightened positive arousal thus became dangerous. At any moment she could lose her partner and become crestfallen. This vignette illustrates the simultaneous disturbance of interactive and self regulation.

In the treatment Jennifer cannot look, must keep her head down, and keep her arousal dampened lest she become excited, happy, and overaroused, anticipating at any moment that I will disrupt the contact. She does not trust me to "swing her". Parallel to the Koulomzin finding, Jennifer has developed special self regulatory requirements in order to engage with her partner, that is, not looking and dampening her arousal. Only then is there a chance that she might talk. For my part, I am very affected by her limp posture, the dampened voice, the absence of eye-contact. I struggle to maintain my own aliveness and hope, sometimes over-reacting in the other direction, becoming too lively.

Jennifer's behavior can be seen within the context of Tronick's (1989) model of the origins of psychopathology in infants of depressed mothers. He describes an interaction in which the mother is unable to monitor and respond to the infant's affect and arousal states. As this interaction fails to regulate the infant in an optimal range, the infant becomes increasingly preoccupied with self-regulation and the management of distress states on his or her own. Viewed from our model of optimum development positing a balance between self and mutual regulation, in much of Jennifer's behavior in the treatment the balance shifts toward the pole of excessive preoccupation with self regulation of distress states. The dampened arousal and gaze aversion in the treatment, as well as the child lying for hours on the floor in front of the wall, can be seen as Jennifer's preoccupation with an attempt to regulate her distress states on her own.

Jennifer seems to illustrate difficulties on both sides of the imbalance between self and mutual regulation. She describes herself as hypervigilant for rejection from the world. She reports that whenever she has the attention of someone important to her, she feels happy but painfully overaroused and she cannot figure out what she, herself, feels or needs: "I'll lose the attention. Will I say something wrong? If only I could do it right this time, could I keep it? I almost want it to go away. It's good but it's too painful. It will become my fault when they do turn away from me. I feel so overstimulated. If I stay the victim and they are mean and I don't have the stage, it's easier. When I do have the stage, I lose myself. I talk too much or I interrupt."

Jennifer fears the possibility of being the recipient of positive experiences which will destabilize her. Her vigilance leads her to focus only on cues of rejection. These do not lead to heightened arousal and excitement, thus they are "safe." As this occurs, she does not process other social cues: when to talk and when to pause, or whose turn it is to speak, describing herself as "interrupting or talking too much." We would describe her as very selectively hypervigilant. In this vignette she also reveals that at the moment of hypervigilance for rejection, she loses access to her inner state, unable to figure out what she needs.

### Self regulatory requirements for engagement in the analyst

Koulomzin's data suggests that we pay more attention to the patient's self regulatory movements. Instead of judging them as evasive, distracting, dissociative, or masturbatory, self regulation behaviors may function to facilitate the engagement. Both patient and analyst use these self-regulatory behaviors to stabilize the engagement. The patient and analyst are both alert to the other's state of comfort and minor fluctuations of this state. These behaviors, when subjected to analysis, can yield valuable clues to the state of each and the quality of the relatedness.

What self-regulatory, self-comforting behavior does the analyst do to sustain engagement? And under what circumstances, with which patients, does the analyst's balance between self and interactive regulation become skewed? The model of a balance between self and interactive regulation, with maximum flexibility to go back and forth moment-by-moment, with either one in the foreground or background, is as applicable to the analyst as to the patient. The analyst touches her hair, shifts her posture, wiggles her feet, rubs her hands together, blows her nose, coughs, yawns, and so on. Recently I (Beebe) had the opportunity to see myself in a videotaped therapy session. I discovered that I do a great deal of self touching, much of it out of awareness. I did know that at times I rub my hands together, particularly when they hurt a little, but I did not realize how much I do it. I was also not aware that frequently I rub my thumb and forefinger together, very slightly. It is very unlikely that I would ever have become aware of this behavior without the aid of the videotape. Such behaviors may remain out of awareness of both patient and analyst, but nevertheless are perceived at a subliminal level and operate as information to both.

In another session (not videotaped) Lydia (treated by Beebe) had a dissociated episode, and I could not make contact with her. During this time I became "squirmy", uncomfortable, shifting the pillow, moving around in my chair. My squirminess forced me to acknowledge to myself my degree of distress, in the face of my inability to reach Lydia. In turn, Lydia was able to notice and talk about her impact on me. In discussing this episode later on, Lydia reported that my squirminess had made it harder for her to "come back", and to find a way to "rest" in me as she usually does. However, she also told me that my squirminess made her more aware that I existed, and in that sense helped her to come back to me as well.

In another episode in the treatment of Lydia when I felt her to be inaccessible, I began to rub my feet together. I recognized it as a gesture that I used throughout my childhood to put myself to sleep at night. My behavior illustrates the usual and inadvertent self regulatory requirements of the analyst, and the impact of interferences in mutual regulation on the analyst's self regulation. I commented to Lydia that I noticed that I had been rubbing my feet together. Lydia was then able to come forward and make the observation that it happened right when she was refusing a comforting interpretation that I was giving her, so I comforted myself. I very much appreciated her observation. A very intimate moment followed, in which we both felt closer, and she expressed regret at having been so inaccessible.

These self-regulatory behaviors of patient and analyst, such as subtle head and gaze aversions, postural orientations, and varieties of self-touching, add valuable information to the treatment when they are recognized, acknowledged, and their place in the ongoing interaction is understood. They can provide critical information about the state of relatedness between the two partners, may reveal various difficulties in regulating the engagement, and may be useful in understanding the patient's history. When the analyst finds herself tilting toward self-regulatory

behaviors, she can be alerted to the possibility of interactive stress, well before she might recognize it at a more conscious, symbolic level.

Whereas the Koulomzin data addressed self regulation processes in the infant, there is also adult research that bears on the self regulation process in the analyst. Norbert Freedman and his colleagues at Downstate have been studying nonverbal self regulation strategies and the role of self-touch in attentional focus for two decades. They argue that movements of the body can promote or retard listening in an interchange. They distinguish between self-focused body movements that reflect information filtering and decoding, and object-focused movements that participate in the process of symbolic representation. Freedman emphasizes that nonverbal behavior in the adult is closely tied to verbal behavior: "The movements are a precondition for verbalization, and constitute the preverbal activities necessary for the attainment of full symbolic representation" (Freedman, Barroso, Bucci, & Grand, 1978, p.173).

Freedman argues that self-focused body movements are a key aspect of the listening process. He considers various forms of self-focused body movements (scratching, grooming, rubbing) to be a compensatory response to some interference in the focusing of attention. These movements implement a change in state that facilitates more optimal information processing. Freedman describes the listening process as composed of the oscillating demands of receptivity and engagement with the partner (receiving information), and the capacity to disengage from the partner sufficiently to "refocus". "Refocusing" is the capacity to restructure information in terms of a pre-existing frame of reference. During reflective refocusing the listener may be more open to associations and memories. Freedman's group analyzed 142 listening sequences from 20 female college students who participated in a conflict-resolution discussion of a moral dilemma with another student. Their data suggested that bilateral continuous self-touching before the onset of the partner's verbalization seemed to enhance the listener's capacity to absorb the partner's message. On the other hand, a "contrasting" movement (motor discharge) at the point of the listener's transition from silence to verbalization seemed to create a body state facilitating sufficient disengagement to allow refocusing.

Although this work is not specifically on therapists and patients, it has great relevance for the analyst's own self-regulatory processes, and the necessity for considerable flexibility. It calls attention to different functions of self-touch behavior, which facilitate different aspects of the listening process. We would add that specific variations in the mutual regulation process will impact on the analyst's use of these self-regulation strategies in the listening process. For example, we speculate that in the face of a patient's extreme affect states such as intense rage, or extreme deadness, the analyst may use these self-regulation processes more extensively, and more out of awareness. Reciprocally, specific variations in the analyst's use of these self-regulation strategies will impact on the nature of the interactive process. For example, some patients are very distracted or derailed by the analyst's shifts in posture, head orientation, or gaze.

### **V. Self regulation and orientational aversion**

In face-to-face interactions, we are tremendously affected by slight orientational aversions, indicating slight alterations and disturbances in the engagement process. This is a pervasive aspect of the face-to-face adult treatment situation. We briefly review here some infant data, an adult experiment, and adult videotaped psychotherapy data.

Research Case studies of Infant Orientational Aversion Severe orientational aversion illustrates infant self regulatory efforts in the context of disturbances of mutual regulation. In

Stern's (1971) study of one mother playing simultaneously with her two 3-month old twins, head and gaze behaviors were coded frame-by-frame from 16 mm film (one frame = 1/24 sec). Whenever the mother oriented and looked toward one twin (Mark), this infant likewise oriented and looked toward her, and vice-versa: Mark could start this process, and mother would reciprocate. However, with the other twin, Fred, the opposite pattern unfolded. Whenever Mother moved toward Fred, Fred would orient and look away; likewise, whenever Fred moved toward mother, mother would orient away toward the other twin. With Mark, the interaction structure was one of mutual approach-approach/ withdrawal-withdrawal. With Fred, the interaction structure was one of mutual approach-withdrawal.

Stern (1971) first described in this case the extreme 90 degree aversions of Fred as he moved his head away until his chin was parallel with his shoulder. Extreme orientational and postural "cut-off" acts have been described by ethologists, in both animal and child behavior (Chance & Larsen, 1976; McGrew, 1972; Blurton-Jones, 1972). Degree of orientation toward and away from the partner provides a powerful signal along a range of readiness to engage, tendencies toward disengagement, and relative severity of disengagement.

Beebe & Stern (1977) did a frame-by-frame microanalysis of one mother-infant pair at four months documenting a similar pattern of maternal approach-infant withdrawal (also described in Beebe, Lachamnn & Jaffe, 1997). This infant not only performed extreme 90 degree head aversions, but also pulled his hand from mother's grasp, oriented his body away from mother as she pulled him toward her, and increasingly resorted to losing postural tonus and going completely limp. This infant essentially had "veto power" over the mother's attempts to visually engage him. Although it was an aversive interaction, it was still highly bi-laterally regulated; the mother's movement of her body and head in toward the infant (looming) was predictably followed by infant movements away from her. And the infant's movements of the head and body away from the mother were predictable followed by maternal chase movements. These sequences occurred with split-second responsivities. Thus both these studies illustrate the ongoing moment-by-moment reciprocal influence process within which the approach/avoid patterns occur.

Research on orientation in adults The power of head orientation and direction of gaze can be seen in an experiment by Freyd et al (1983) (see Fogel, 1993) who asked viewers to rate the famous painting "Mona Lisa" with a list of adjectives. When looking at the original painting in which the famous lady's head and gaze are oriented toward the viewer, she was described as dreamy, friendly, sensitive, involved, honest, and inviting. A second group of subjects looked at an altered version of the painting in which her head and gaze were oriented slightly to the left away from the viewer. These subjects were unaware that the painting had been altered. In this altered version, the lady was described by the subjects as proud, tense, unsympathetic, cold, and detached. This list of adjectives is strikingly similar to common descriptions of the narcissistic personality. Ironically, the first list could describe an ideal therapist.

Videotape analysis of adult psychotherapy Trout & Rosenfeld (1980) have described that during psychotherapy sessions (sitting up), both patient's and therapist's report of higher rapport is associated with a higher incidence of leaning the upper bodies toward each other, and holding the limbs in mirror image postures. Thus rapport may be disturbed if either partner is involved in any degree of orientational aversion.

Davis & Hadiks (1990) have coded videotapes of face-to-face psychotherapy sessions between a female patient and a male therapist. They coded orientational/position states (varying from full away to full vis-vis orientation). They also coded verbalization for level of experiential

involvement. They found that the therapist's intensity and complexity of gestures increased as his affective immediacy and interpretive complexity increased. With higher levels of verbal involvement, the therapist also increasingly oriented toward the patient. Similarly, as the patient shifted from superficial discussion to actively exploring her internal reactions, her bodily position became more accessible, open and oriented toward the therapist.

Davis and Hadiks conclude that orientation and bodily position is an index of subtle fluctuations in defensiveness and rapport and level of emotional involvement between the partners. They also note that while these subtle movement patterns are not likely to be experienced consciously by either partner, they are "read" by both, they are one essential basis of the therapist's clinical intuition, and they are a critical part of the therapy process. Thus establishing rapport in therapy is highly associated with orientational engagement.

### **VI. Conclusion: Toward a procedural theory of interaction**

Psychoanalysis is currently seeking an expanded theory of interaction. This theory must ultimately address the nonverbal and procedural as well as the verbal dimensions of the interaction (see Bucchi, 1985, 1997). The nonverbal, procedural dimension is usually out of awareness, but it provides a continuous background of moment-by-moment mutual influence. The verbal system is usually in the foreground, and is more intermittent (i.e., speaking vs. listening). Parallel to the exchanges occurring on a verbal level, patient and analyst are continuously altering each other's timing, spatial organization, affect, and arousal, on a moment-to-moment basis.

In this paper we have addressed the nonverbal, procedural dimension, using a theory of interaction which specifies how the individual is affected by his own behavior (self regulation) as well as by that of his partner (interactive regulation). Interactive regulation flows in both directions, on a moment-to-moment basis, so that each experiences influencing, as well as being influenced by, the other's behavior. Behavior is simultaneously communicative and self-regulatory, so that shifts in influencing and being influenced by the partner are accompanied by simultaneous shifts in self regulation behaviors and arousal. We have argued that this view of nonverbal interaction is as relevant to adult communication as it is to mother-infant communication.

Analyst and patient, as well as mother and infant, participate in a moment-by-moment mutual influence process at the nonverbal level. This is the fundamental nature of social behavior. Each has continuous rhythms of behavior on and off, and even the "off" moments of verbal or gestural "silence" are communicative (Jaffe & Feldstein, 1970; Jaffe et al, 1998). The rhythms of behavior of the two partners are always coordinated, in some way, usually out of awareness (Capella, 1991; Warner, 1996; Langs & Badalamenti, 1996; Chapple, 1970; Iberall & McCulloch, 1969).

The various ways in which inner state and interactive process are linked are offered as organizing principles of the integration of self and interactive regulation. Although much of the research we reviewed is based on interactions with infants, we contend that these principles are as relevant to adults. This research documents a number of general principles for a theory of interaction at the nonverbal level:

- 1) In a systems view, self and interactive regulation are simultaneous, complementary, and optimally in dynamic balance. Thus the individual can be fully described only in relation to the dyad.

- 2) Across the lifespan, each partner participates in a moment-by-moment reciprocal influence process at the nonverbal level, usually out of awareness (Cappella, 1991; Cohn & Tronick, 1988; Crown, 1991; Langs et al, 1996; Jaffe & Feldstein, 1970; Jaffe, Beebe, Feldstein, Crown, & Jasnaw, 1997; Warner, 1987, 1988).
- 3) Each dyadic system constructs a unique facilitation of, and constraint on, the individual's access to, awareness of, regard for, and ability to use, his own states (Sander, 1977, 1985).
- 4) Through cross-modal matching we can link the behavior we see in the partner and our own inner proprioception, constituting a fundamental relatedness between self and other from the beginning of life (Meltzoff, 1990, 1993).
- 5) The mere perception of positive or negative emotion in the partner creates a resonant emotional state in the perceiver, re-organizing the frontal lobe of the brain (Davidson & Fox, 1982; Schore, 1994).
- 6) Since a person's facial expression is associated with a particular physiological pattern, matching the expression of the partner creates in the onlooker a similar physiological state (Ekman et al, 1983).
- 7) In the reciprocal influence process, each affects the other's "state of consciousness" (state of brain organization) (Tronick, 1996), especially in states of prolonged matching (Schore, 1994).
- 8) Behavior, arousal, and subjective awareness are all simultaneously organized in the interactive process (Ekman et al, 1983; Izard, 1971; Adelman & Zajonc, 1989).

These principles illustrate an integration of behavior, physiological arousal, proprioception, brain activation, and subjective awareness. Many others could be defined (see Schore, 1994; Perry, 1996). They suggest the multiple levels at which self and interactive regulation interface. These organizing principles of regulation describe self- and interactive *process*, not dynamic content. They can apply to the verbal as well as nonverbal levels, and they impact on the more familiar psychoanalytic dynamic issues such as, for example, safety, efficacy, self esteem, separation and reunion, boundaries, self definition, intimacy, aloneness in the presence of the partner, and mutual recognition.

In summary, we used vignettes from infant research, adult research, and adult treatment to illustrate subtle variations in the ways in which self and interactive regulation reciprocally impact on each other. Observing and owning this process enriches our range and flexibility as analysts. Attention to this self and interactive interface is critical to restoring, expanding, and in some cases creating access to inner experience as well as interpersonal engagement.

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