Organizing Principles of Interaction from Infant Research and the Lifespan Prediction of Attachment: Application to Adult Treatment

Beatrice Beebe, Ph.D. and Frank Lachmann, Ph.D.

In this paper we apply organizing principles of interaction documented in face-to-face interactions in infancy to both the implicit and explicit dimensions of therapeutic interaction in psychoanalysis. In our previous work we approached interaction with a dyadic systems model of communication (Beebe and Lachmann 2002, Beebe et al. 1992). In this view all communication is coconstructed by both partners, although not necessarily in symmetrical ways. We used the dyadic systems model to define organizing principles of interaction for psychoanalysis. The most general of these organizing principles entails the integration of self- and interactive regulation, which are simultaneous, complementary, and optimally in dynamic balance. We further differentiated “three principles of salience”: ongoing regulation, disruption and repair, and heightened affective moments, each of which refines our understanding of the nature of self- and interactive regulation (Beebe and Lachmann 1994). In this paper we extend the concept of organizing principles of interaction in psychoanalysis to vocal rhythm coordination, facial mirroring, and distress regulation. The concept of organizing principles can further specify the details of how interactions are regulated.

Infant research has shown that vocal rhythm coordination, facial mirroring, and distress regulation in the early months of life predict infant attachment at one year. These three patterns organize the nonverbal, implicit

* We note as a caveat that we are limiting the concept of nonverbal communication in psychoanalysis to the repetitive, rapid action sequences that are largely out of awareness. Symbolic nonverbal gestures, such as a raised hand held flat and open, which is an explicit communication of “stop,” are excluded from our discussion. We wish to acknowledge the contributions of Stephen Knoblauch, Judith Rustin, Dorienne Sorter, Barbara Kane, Lin Reicher, Sara Markese, Lauren Cooper, Michael Ritter, Emily Brodie, and Marina Tasopholous.

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dimension of relatedness. We propose that they operate across the lifespan, mediating all affiliative-attachment-intimacy systems, including mother and infant, adult lovers, and patient-analyst. We bring two types of evidence to bear on this proposal. In the first, the three patterns of interaction (vocal rhythm coordination, facial mirroring, and distress regulation) have been shown to varying degrees to organize affiliation/intimacy in infancy, childhood, adolescence, and adulthood. In the second, attachment itself has been shown to predict development from infancy to elementary school to adolescence to adulthood. Because the three patterns of interaction predict one-year infant attachment, and one-year attachment predicts adult attachment, we infer that these three patterns continue to mediate the co-construction of attachment across the lifespan. Integrating both explicit and implicit modes of communication, we illustrate how these three patterns organize the patient-analyst relationship in one treatment case.

**Dyadic Systems View**

We approach interaction with a dyadic systems model of communication. In this view all communication is co-constructed by both partners, although not necessarily in symmetrical ways. Interactive exchanges are a product of the integration of self- and interactive regulation. Interactive regulation is organized through bi-directional "influences," or "co-construction." Since this term is so easily misunderstood, we reiterate that neither causality nor mutuality is implied; rather bi-directional coordination refers to the probability that one person's behavioral stream can be predicted from that of the other, and vice versa. Positive as well as aversive interactions can be bi-directionally coordinated. This concept of bi-directional coordination defines one use of the term "co-construction," that is, all interactions are co-constructed by both people.

In translating the bi-directional model for psychoanalysis, it is important to articulate both the patient's experience of being influenced by the analyst, as well as influencing the analyst; and the analyst's experience of being influenced by the patient, as well as influencing the patient. Of these four vectors of experience (two for each partner), often one or two are privileged by patient and analyst. Self-regulation is also a critical aspect of the systems model. Interactive exchanges are a product of the integration of self- and interactive regulation.
Sander (1977, 1985, 1995) has argued for a systems model integrating self- and interactive regulation (see also Gianino and Tronick 1988, Tronick 1989). He describes the infant as bringing primary endogenous activity that must be coordinated with the partner. Included in this primary activity is an intrinsic motivation to order information, detect regularity, generate and act on expectancies. Sander proposes that the way self-regulation is organized, in relation to the dyad, sets the stage for the sense of self as agent. A subjectivity of “one's own” is continuously being organized, including access to, articulation of, and regard for one's inner states. But the inner process is enhanced or limited by the ongoing interaction, and vice versa. Thus inner process is organized by both self- and interactive regulation. The individual can be fully described only in relation to the dyad. That self- and interactive regulation always impact on each other defines our second use of “co-construction,” the co-construction of inner and relational processes (see Beebe and Lachmann 1998).

The co-construction view advanced here potentially alters our usual understanding of the analyst's subjectivity (see Beebe and Lachmann 2002). Instead of seeing the analyst's subjectivity as potentially constraining, biasing, distorting, or facilitating the process, using the co-construction model we view each partner's subjective experience as an emergent process, continuously affected by the interaction as well as by the person's own self-regulation.

**Implicit Relational Patterns**

Forms of attachment and intimacy are organized in infancy and carried forward in development through implicit relational patterns, as well as through explicit symbolic narratives. Moment-to-moment shifts in face, voice, orientation, and rhythm provide an essential means of sensing the partner. Mother and infant as well as two adult partners, such as lovers, or analyst and patient, develop repetitive patterns of regulating face and voice in “rhythms of dialogue” (see Jaffe and Feldstein 1970, Jaffe et al. 2001), generally out of awareness. The sequence of one's own actions in relation to those of the partner, and an associated self-regulatory range and style, come to be expected. Even four-month-old infants detect regularity in spatiotemporal events, in both the self and the environment, and they develop expectancies based on these events, which implies some future-oriented
mental process (Haith, Hazan, and Goodman 1988). We use patterns of expectation to define presymbolic representations in infancy (see Beebe and Lachmann 1994), which is one way of conceptualizing the initial organization of implicit procedural processing.

Whereas explicit memory refers to symbolically organized intentional recall for information and events, implicit memory includes procedural and emotional memory that is outside of awareness. Procedural memory refers to action sequences that are encoded nonsymbolically as patterns of expectation and influence the organizational processes that guide behavior (Grigsby and Hartlaub 1994, Squire and Cohen 1985). These action sequences are initially “intentional,” in the sense of goal-directed, both for the infant as well as the adult (Mueller and Overton 1998). Only after they become automatic with repeated practice are they “nonconscious” or out of awareness. They can again become the focus of awareness if these action sequences do not proceed as expected.

Lyons-Ruth (1999) has defined implicit relational knowing as “… rule based representations of how to proceed, of how to do things … with others … such as knowing how to joke around, express affection, or get attention … as much affective and interactive … as cognitive … (it) begins to be represented long before the availability of language and continues to operate implicitly throughout life” (p. 284). Another example of implicit “knowing how to proceed” can be illustrated by attention regulation patterns, such as who initiates looking, whether or not the partners mutually gaze at each other, how long it is comfortable to hold a mutual gaze, who looks away first, and how reactive either partner is to the other’s looking away. In general, it is at the implicit procedural level, on a moment-to-moment basis, that powerful interactive “emotion schemes” (Bucci 1997) of face, gaze, vocalization, and orientation are organized, shifts in degrees of tracking and coordinating with the partner are played out (see Jaffe et al. 2001), and disruption and repair are negotiated (see Beebe and Lachmann 1994, Tronick 1989).

Lyons-Ruth (1998, 1999) notes that implicit relational knowing operates out of awareness and outside of verbal consciousness. The organization of meaning is implicit in the action sequences of the relational dialogue and does not require reflective thought or verbalization to be known. She defines development, and development in psychoanalysis, as increasing differentiation and integration of implicit relational procedures, which occur
parallel to a similar process in the explicit realm. As Lyons-Ruth argues and as we illustrate below in the case presentation, implicit relational procedures are extremely sensitive to the quality of participation by the partner.

In psychoanalytic treatment the expectancies that regulate intimate relating can be reorganized in the implicit domain without necessarily reaching conscious awareness (see Beebe and Lachmann 2002). Lyons-Ruth notes that only a small area of the patient's implicit relational knowing will ever become the subject of verbal narrative or transference interpretation. By implication, the implicit mode is the far more pervasive and potentially more powerfully organizing than the explicit. The idea that therapeutic action can occur at the implicit level without verbalization is an important change for a theory of therapeutic action. This position is forcefully argued by Grigsby and Hartlaub (1994), Clyman (1991), Emde and colleagues (1991), Bucci (1997), Schore (1994, 1996), Stern, Sander, Nahum, Harrison, Bruchweiler-Stem, and Tronick, (1998), Pally (1998), and Lyons-Ruth (1998), among others. Clyman has proposed that implicit procedural processing provides a measure of continuity from childhood to adulthood and organizes transference expectations.

These two levels, the implicit action sequence and the explicit symbolized narration, must be integrated for a fuller understanding of therapeutic action in psychoanalysis (see Beebe and Lachmann 2002). These two levels potentially affect each other. The struggle to symbolize the implicit action level can be seen as one of the major goals of psychoanalysis (Bucci 1985, 1997). The nature of the symbolization can then potentially affect the implicit action level. However, therapeutic action proceeds in both these modes, whether or not they are integrated.

The distinction between explicit and implicit processing provides a new framework within which to integrate verbal and nonverbal communication in psychoanalysis. Patterns of expectation provide one definition of implicit procedural knowledge, which is a potent mode of therapeutic action. Therapeutic action can occur in an implicit form of processing without necessarily translating the communication into an explicit verbal mode.

Despite the importance of implicit relational knowing in potential continuities across the life span, we do not hold that early patterns necessarily become long-term entrenched procedural memories that govern interaction in adult dyadic life (see Harris 1997). Instead we espouse a transformational view, along the lines of Sander (1977, 1995) and Sameroff (1983), that early
patterns set a trajectory that can nevertheless transform. Only in pathology is there a relative loss of this transformational process.

The implicit organizing principles that we illustrate in this paper are vocal rhythm coordination, facial mirroring, and distress regulation. These principles are derived from research on mother-infant face-to-face interaction. We chose them because all three patterns have been used to predict 12-month infant attachment. Therefore these three patterns can be considered to be nonverbal modes of the transmission of attachment quality in infancy. We also chose them because all three patterns have been shown, to varying degrees, to organize affiliation/intimacy patterns in childhood, adolescence, and adulthood. We thus propose that these three patterns are modes of transmission of attachment and affiliation across the lifespan. This argument is strengthened by recent research showing that attachment patterns assessed at one year predict development in elementary school, adolescence, and adulthood. Extending this argument, we propose that vocal rhythm coordination, facial mirroring, and distress regulation also carry qualities of attachment, affiliation, and intimacy in psychoanalysis, constituting organizing principles of implicit relational knowing.

**Lifespan Prediction of Attachment from Infancy to Adulthood**

Attachment theory provides a unique framework for conceptualizing a lifespan model of the organization and representation of affiliative/intimate interactions. This framework includes both implicit action patterns and explicit representation patterns. Bowlby (1969, 1980) and Ainsworth and colleagues (1978) proposed that infants, children, and adults construct mental models (representations) of self and others out of interactions with primary partners, and that these mental models provide continuity of relationship styles. The working hypothesis is that the same characteristics of dyadic communication that influence the course of infant and childhood attachment (such as responsivity, predictability, support, safety) are also among the determinants of adult representations of attachment security (see Hazan and Shaver 1987). Attachment researchers share the assumption that mental models of relationships are open to revision. However, they differ in emphasizing personal continuity versus dyadic transaction and transformation; they differ in the degree to which these mental models are seen as co-constructed, transformational processes, organized as a function not only of the individual, but of the relationship pattern.
We view infant as well as adult attachments as transformational or “emergent” dyadic processes, co-constructed by both partners. A systems model offers a theory of change based on transformation of patterns: systems that function together are changed by their mutual activity; that is, they generate emergent properties (see Sameroff 1983). Thus adult attachments are not fully predictable from infancy, childhood, or adolescence. Our mental models (representations) of our attachments do not persist as rigid prototypes, but transform, as Freud originally suggested (see Bergmann 1987). We conceptualize this transformation as a bi-directional, reciprocal process between partners. Relatively enduring mental models of affiliation/intimacy/attachment are potentially in a continuous dyadic process of transformation and reconstruction. Rather than conceptualizing continuity as a self-contained process within a person, we view the dyadic process as the route to predictability in development: continuity in development can be detected through relationship patterns, which include both self- and interactive regulation processes (Sameroff and Chandler 1976, Sroufe and Fleeson 1986, Zeanah et al. 1989).

In the past decade, several studies have documented that the mother’s attachment status during her pregnancy, assessed by the Adult Attachment Interview (AAI), predicts the infant’s attachment security at one year (Benoit and Parker 1994, Fonagy et al. 1991, Ward and Carlson 1995). The AAI is an extensive interview-based instrument that evaluates adult security of attachment based on the coherence of the picture that the individual presents of his or her history (George et al. 1996).

Three remarkable recent studies have shown that infant attachment at one year can in turn predict childhood, adolescent, and adult outcomes. Waters and colleagues (2000) predicted attachment at age 21 from infant attachment at one year. Sroufe and colleagues (2002) predicted elementary school adjustment, and peer relationships/intimacy in middle childhood and adolescence from one-year attachment. Grossman and colleagues (2002) predicted romantic attachment representation at 22 years from infancy, childhood, and adolescent attachment-related measures. Waters and colleagues (2000) evaluated 60 infants for attachment security at one year in the Ainsworth Strange Situation test. Of these, 50 were evaluated again at age 21 for attachment security (AAI). Seventy-eight percent of the individuals retained their secure or insecure status (72 percent using 3 groups: secure, insecure-avoidant, and insecure-resistant). Among
secures, infants whose mothers reported one or more traumatic events (loss of a parent, parental divorce, life-threatening illness of child or parent, parental psychiatric disorder) were 4 times as likely to change to an insecure attachment classification than infants whose mothers reported none. This study demonstrates both continuity of attachment classification under more relatively optimal developmental circumstances, as well as the transformational nature of attachment formation, particularly less optimal transformations, under conditions of developmental stress.

Sroufe's group (Collins and Sroufe 2002, Sroufe et al. 2002) followed 175 children from infancy to young adulthood. They propose that the intimacy of romantic relationships is based upon experiences that support the development of intimacy in nonromantic relationships (in a transactional, transformational process). The quality of peer experiences in preschool, elementary school, and adolescence was predicted by the Ainsworth infant attachment classifications. The preschool and elementary school measures were based on teacher ratings; adolescent measures were peer competence and capacity for relationship vulnerability, based on ratings from camp counselors, and friendship intimacy, based on analysis of an interview transcript. Ten- to eleven-year-olds who were classified as secure in infancy were more likely to form a friendship than children classified as insecure in infancy, and those with a secure history were more likely to have friends with a similar secure history. In an intensive analysis of a subset of adolescents (N = 41), those who formed couples had a history of secure attachment in infancy. A prediction to romantic attachment at age 21 is forthcoming from this group.

Currently the strongest empirical longitudinal support for continuities of attachment styles from infancy to adult mental models of romantic attachment comes from the work of Grossman and colleagues (2002). Their study followed 49 families, with many measures of maternal/paternal sensitivity, parent-child play, child and mother attachment, and child discourse quality, across infancy, 12 and 18 months, and 2, 3, 6, and 10 years. At age 16, adolescents were assessed, by projective stories, for flexibility of response to social rejection by a “romantic” partner. At age 22, the young adults were assessed with the Owens and colleagues (1995) measure of security of current romantic model. Although there were numerous findings, here we focus only on the prediction of 22-year-old romantic attachment representation.

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The two strongest predictors of adult romantic attachment model at age 22 in the Grossman and colleagues study were (1) a composite measure of maternal sensitivity from infancy to 16 years, and (2) the 16-year-old's flexibility of response to romantic rejection, assessed by projective stories. In the Grossman and colleagues measure, a sensitive mother is attentive to her child's communications, interprets them “correctly,” responds “appropriately,” acknowledges her child's feelings, helps her child know his/her own motives and put them into words, and explains her own motives. In addition, the Grossman and colleagues study found that the child's attachment status at age 6 predicted 22-year-old romantic attachment representation. And infant attachment status at 12 and 18 months predicted 6-year-old attachment status. This latter finding suggests that infant attachment affects 22-year-old romantic attachment in a transformational way, via its link to 6-year-old attachment. Interestingly, the father's sensitive and gentle challenging play, which supported the toddler's exploratory play at 2 and 3 years, also predicted the 22-year-old's romantic attachment representation. This study is the first to provide a definitive empirical support of the hypothesis that childhood- and infant-attachment patterns are indeed relevant to the eventual romantic love model of the young adult. The Grossman and colleagues study emphasizes the concept of maternal sensitivity as the “mechanism” or key operative variable explaining these continuities across the lifespan.

The predictions of Waters and colleagues (2000), Sroufe and colleagues (2002), and Grossman and colleagues (2002) describe transformational trajectories, in which attachment patterns may remain stable, or predictably transform, as a function of particular contexts such as trauma.

How Affiliation/Intimacy/Attachment is Transmitted across the Lifespan: Three Proposed Organizing Principles of Interaction

We focus on three patterns of interaction between mother and infant at 4 months, which have been shown to predict infant attachment at one year, thus organizing the nonverbal implicit dimension of relatedness in infancy. The three patterns are vocal rhythm coordination, facial mirroring, and distress regulation. As we will describe below, these three patterns continue to mediate affiliation/intimacy/attachment throughout life. And as we have shown above, attachment at one year predicts a transformational trajectory to young adulthood. We thus propose that vocal rhythm coordination, facial
mirroring, and distress regulation are key organizing principles of implicit relational knowing, carrying qualities of attachment and intimacy across the lifespan.

**Vocal Rhythm Coordination as a Lifespan Organizing Principle of Interactions**

Research on *vocal rhythm coordination* illustrates the co-construction of attachment and intimacy patterns across the life span. In social interactions, rhythm itself provides ongoing information necessary to predict and coordinate with one's partner, so that each can anticipate how the other will proceed (see Jaffe et al. 2001, Warner 1992). We experience some interaction rhythms, perhaps those with which we resonate, as “good vibes,” whereas others are experienced as disturbing. Because a partner's rhythm is assessed in reference to one's own, Byers (1976) suggests that we continuously assess an interpersonal rhythmic relationship, a form of coordination. Research on vocal rhythm refines our understanding of how partners proceed moment by moment, how each knows when it is their turn to speak, how easily the turn is exchanged, how tightly each partner tracks the other's vocal rhythm, and rules for interruption and joining.

Bi-directional coordination in the timing of vocal exchanges, during which each partner “tracks” (correlates with) the durations of vocalizations and pauses of the other, have been demonstrated for adults as well as mothers and infants (Beebe et al. 2000, Capella 1981, 1991, Crown 1991, Feldstein and Welkowitz 1978, Jaffe and Feldstein 1970, Jaffe et al. 2001, Warner et al. 1987). When speakers coordinate rhythmic patterns such as vocalizing and pausing, they are in fact exchanging important information regarding the perceived warmth, similarity, and empathy of their interaction. Adult research has continued to show that matching and coordination of the timing of communicative behaviors facilitate interpersonal attraction, empathy, and social relatedness (see Crown 1991).

A study by Jaffe and colleagues (2001) documents a continuum of 4-month mother-infant vocal rhythm coordination, ranging from high to low, which predicted one-year attachment outcomes. Midrange coordination predicted secure attachment whereas scores outside the midrange predicted insecure attachment. High coordination was conceptualized as interactive vigilance, low coordination as an aspect of withdrawal or inhibition. Interactive vigilance
and interactive inhibition further articulate forms of interactive regulation that can be used in adult treatment. Although currently no longitudinal lifespan data on vocal rhythm coordination exist, we speculate that vocal rhythm coordination is one nonverbal mode of transmission of intimacy and attachment styles across the lifespan.

The coordination of timing patterns is like the music on which verbal content is later superimposed (see Beebe and McCrorie 2003, Beebe et al. 2000, Jaffe et al. 2001). Just as important as the words is the way that we talk and coordinate our rhythms of sounds and silence, which carry dynamic, emotional meanings (see Dissanyake 1996). From infancy onward we coordinate (to varying degrees) with a partner as to when to vocalize, when to pause, and for how long; whose turn it is, when to join in simultaneously, and how to exchange turns. Through expectancies we learn to anticipate the partner’s pattern in relation to our own. In so doing we are learning nonverbal ways of “being with” the other (see Stern, 1977, 1985). In fact, Dissanyake (1996) argues that the mother-infant dialogue creates a fundamental emotional narrative out of which adult music, language, and poetry can grow. McCrorie (2001) elaborates this argument for poetry with the Jaffe and colleagues (2001) data on vocal rhythm coordination.

Building on these midrange coordination findings, a “balance model” was generated, positing a midrange optimum in both self- and interactive regulation (Beebe and Jaffe 1999, Beebe and McCrorie 2003). In the mid-range, interactive coordination is present but neither insufficient nor 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 attention, affect, and arousal. For each partner, operating outside the midrange may index an attempt to cope with a disturbance in the interaction. 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.”

We thus suggest that timing and rhythm coordination is one key means through which security of attachment is co-constructed: lovers, mothers and infants, analysts and patients all create different bi-directional patterns of vocal rhythm coordination, moment by moment (see Beebe and McCrorie 2003).
These different patterns will contribute to different emotional climates and different attachment security, and they will potentially trigger unconscious fantasies.


**Facial Mirroring as a Lifespan Organizing Principle of Interactions**

The capacity to enter into split-second, highly coordinated vocal exchanges in infancy is paralleled by a similar capacity to coordinate split-second facial exchanges. This capacity is highly adaptive in evolution. Even monkeys participate in split-second facial exchanges with each other (Chevalnier-Skolnikoff 1976). The term *facial mirroring* originated in psychoanalysis. Winnicott (1965) suggested that the precursor of the mirror is the mother's face: when the infant looks at his mother, he sees himself. Using second-by-second microanalyses of videotape and film, research has documented that facial mirroring in mother-infant face-to-face exchanges is very fast, usually split-second. In general each partner affects the other's face, from moment to moment (Beebe and Gerstman 1980, Beebe and Stern 1977, Cohn and Beebe 1990, Cohn and Tronick 1988, Kronen 1982).

In infancy, maternal facial expression response to infant facial expression, from second to second, predicts one-year infant attachment outcomes and distress regulation in toddlers (Malatesta et al. 1989). Mothers who show a lower, or more “midrange,” degree of facial coordination have secure infants at one year, whereas mothers with high coordination have insecure-avoidant infants at one year. Mothers with disturbances in facial empathy (such as a positive face in response to an infant distress face) have toddlers who show facial constriction of distress, “holding it in.”
In the “visual cliff” experiment (Klinnert et al. 1986), one-year-old infants use the mother's face to guide their evaluation of danger. Under a glass table sits a “visual cliff,” so it seems that the child might fall. Across the table at the other end is an attractive toy. The child begins to cross, then looks back to the mother. If she displays a fear face, the child will not cross. If she smiles, the child crosses easily.

Facial mirroring and the coordination of facial exchanges is as relevant to adults as it is to mothers and infants. It can thus be seen as a lifespan organizing principle of interactions. Eibl-Eibesfeldt (1970) filmed lovers flirting on park benches. Because his camera was rigged, seeming to film in a different direction, the lovers were entirely unaware of being filmed. His microanalysis of the film revealed split-second responsivity of face, gaze, and head orientation between the lovers.

In studying adults, Ekman and colleagues (1983) found that a particular facial expression is associated with a particular pattern of physiological arousal. By matching the expression of the partner, the onlooker produces a similar physiological state in himself. Thus, in a process of facial mirroring, each is participating in the subjective state of the other. Furthermore, an internal process (physiological arousal) and a relational process (matching) are inextricably coordinated and are organized concurrently.

Facial mirroring occurs largely out of awareness. Dimberg and colleagues (2000) exposed adult subjects to 30 milliseconds of happy, angry, and neutral target faces through a masking technique, so that the subjects could not consciously perceive the face. Simultaneously, subjects were monitored for facial activity by miniature electrodes. Despite the fact that the subjects could not consciously perceive the faces, they displayed distinct facial muscle reactions that corresponded to the happy and angry target faces. Thus, positive and negative facial responses can be evoked out of awareness. In this sense important aspects of face-to-face communication occurs in a nonconscious, procedural mode.

Facial mirroring is important in adult treatment. In Heller and Haynal's (1997) remarkable study, “A Doctor's Face: Mirror of His Patient's Suicidal Projects,” one psychiatrist interviewed patients who had attempted suicide, with one video camera on each person's face. The psychiatrist's own predictions of which patients would reattempt suicide, written immediately after the interview, correctly identified only 29 percent of the patients who later made a second attempt. However, a microanalysis of the facial responsivity
between the doctor and the patient correctly identified 81 percent of the patients who later made a second attempt. And it was the doctor's face that was more powerful than the patient's face in this prediction. With his patients who would later make another attempt, the doctor frowned more, showed more head and eye orientation, more overall facial activation, and increased speech. This study is an excellent example of implicit relational knowing, operating outside of awareness and outside of verbal consciousness. The doctor “knew” something in the implicit mode that he could not access in the explicit mode.

**Distress Regulation as a Lifespan Organizing Principle of Interactions**

In Ainsworth's ([Ainsworth et al. 1978](https://doi.org/10.1007/978-94-009-9366-2)) seminal work on attachment, distress regulation in the mother-infant dyad was seen as central. Ainsworth showed that maternal unresponsiveness to infant crying differentiated insecure as opposed to secure attachment. A number of studies have suggested that securely attached infants exhibit more fuss cry than insecure, suggesting that more frequent crying patterns may be a reflection of the competence of the infants in communicating distress to the caregiver (see [Bradshaw et al. 1987](https://doi.org/10.1007/BF00647702), [Del Carmen et al. 1993](https://doi.org/10.1007/978-1-4615-6203-9), [Isabella and Belsky 1991](https://doi.org/10.1007/978-1-4615-6203-9), [Kiser et al. 1986](https://doi.org/10.1007/978-1-4615-6203-9)). Distress regulation in infancy predicts one-year infant attachment. Del Carmen and colleagues (1993) found that mother calm/soothe in response to infant fuss/cry at 3 months predicted 12-month secure infant attachment.

Distress regulation is a central aspect of mother-infant interaction (see [Beebe 2002](https://doi.org/10.1007/978-1-4615-6203-9)). The critical issue in the management of infant distress is the capacity that both infant and parent bring to soothe and dampen as opposed to escalate infant distress. Temperament of both partners plays an important role. [Korner and Grobstein (1977)](https://doi.org/10.1007/978-1-4615-6203-9) and [Brazelton (1994)](https://doi.org/10.1007/978-1-4615-6203-9), among others, have described variations in the neonate's ability to regulate state. By the time infants are assessed in the face-to-face situation, typically 3-6 months, neonatal fluctuations in the management of an alert state have receded with maturation of the nervous system, and the infant's temperament has become inextricably intertwined with interactive patterns in the dyad. Nevertheless, there are substantial differences in the ability of infants to manage moments of heightened distress. Some infants become increasingly distressed and the filming has to be interrupted. Other infants are more “resilient,” able to pull back from a distressed state, calm down, and continue...
to engage and signal the caregiver (see Tronick 1989). These differing patterns are strongly affected by the nature of the mother's management of distress.

An extreme form of “mutually escalating overarousal,” where each partner responded to the other's distress with a reciprocal escalation, each “topping” the other, until the infant vomited, was described by Beebe (2000). When evaluated in the Ainsworth attachment test at one year, this infant was classified as “disorganized” attachment. In this form of attachment, the infant displays simultaneous approach-avoidance patterns.

Infant capacity for self-comfort, an important form of self-regulation, is seen in fingering clothes, skin, an object (strap of the seat), mother's hand, or putting a finger into the mouth. Tronick (1989) has shown that infants of depressed mothers are preoccupied with self-comforting behaviors, attempting to manage distress more or less “on their own.” More self-touch occurs in infants classified as avoidant vs. secure attachment (Koulomzin et al. 2002).

The parent's partial “matching” or “joining” of the infant's vocal distress, with “woe face”; and associated vocal “woe” contours (vocal empathy), but without the full volume or intensity, is often effective in helping the infant to dampen arousal. Matching the rhythm (but not the volume) of the crying, and then gradually slowing down, facilitates infant distress regulation (Beebe 2000, Beebe 2003, Gergeley and Watson 1997, Stern 1985). When the infant is in a very dampened state, such as stilling, or loss of tonus with limp posture, partially joining this state, staying rather still, waiting, and gently responding to any slight change of posture or head orientation with a gentle matching, can help the infant re-engage (see Cohen and Beebe 2003).

Maternal difficulty in “partnering” infant distress may result from denial of infant distress, for example, as the infant cries, mother says, “We like this, don't we,” or mother shows positive faces in response to infant distress (see Malatesta et al. 1989, Lyons-Ruth 1998). Or difficulty in partnering distress may be associated with the mother's idealized fantasy that she will be able to protect her infant from all distress. In the treatment of mother-infant pairs, Beebe (2003) assesses the mother's approach to her infant's distress, observing her ability to empathize with the distress, with “woe” face and voice, or by gently matching the infant's distress rhythms to calm the infant down, or by entering the dampened state.
Distress regulation in toddlers and middle childhood is associated with attachment patterns (Cassidy and Kobak 1988, Marvin et al. 2002). As infants, insecure avoidant children avoid the mother in the reunion of the Strange Situation. Cassidy and Kobak interpret this avoidance as a form of masking of negative affect. They describe the ways that insecure-avoidant children manage their distress by shifting attention away from the parent, remaining “cool,” polite, and neutral. More overt expression of anger or neediness might alienate the attachment figure. In childhood and adolescence, studies of the representation of attachment patterns, or internal working models, suggest that insecure-avoidant individuals develop biases in the ways that information is processed, so that the attachment system is deactivated, or idealized images of self and other are created (Cassidy and Kobak 1988).

Distress regulation in adolescence is associated with attachment patterns. Kobak and Sceery (1988) showed systematic differences in affect regulation associated with attachment patterns as measured by the Adult Attachment Interview (AAI), self-report measures, and peer ratings. Whereas the secure group was more resilient, less anxious and hostile, reporting little distress, the insecure-avoidant (“dismissing”) group was less resilient, more hostile, and more lonely. The insecure-anxious (“preoccupied”) group was less resilient, more anxious, and reported more distress.

We illustrate distress regulation in psychoanalysis with a vignette taken from Beebe and colleagues (2003, in press). This vignette from a videotaped psychoanalytic session of a female patient in a three times-per-week treatment, sitting up, can illustrate distress regulation in psychoanalysis, and the contributions of both patient and analyst to the success of the distress regulation. This description primarily addresses the nonverbal level of the interaction.

The patient was increasingly distressed, gesturing rapidly with her hands, torso leaning forward tautly, face screwed into a pre-cry, speaking tensely. The analyst silently listened, his face very attentive. As the patient's agitation began, the analyst slightly shifted the orientation of his chair toward the patient. Both maintained continuous eye contact. As the agitation mounted, the analyst's foot made intermittent brief, rapid jiggles, matching the rhythm of the patient's body. He then moved slightly forward in his chair. At this point the heads of both analyst and patient went up in synchronous movement. At each escalation of the patient's agitation, the
analyst participated, crossing and uncrossing his legs, and nodding his head up and down in rhythm with the patient's movements, each time saying “yes” softly. Gradually the patient began to calm down; the analyst's head movements became slower. There were several long moments of silence. Then slowly they began to speak to each other.

In this vignette, the analyst participated in the sequence of escalating agitation and calming down. Although the patient's sequence can be conceptualized primarily in terms of self-regulation, presumably the analyst's movements also influenced her management of the arousal. The analyst did not match the patient's level of arousal. Instead, at critical shifts in the patient's arousal (increasing and decreasing), the analyst “marked” the shifts with ones of his own. The analyst's own self-regulatory movements revealed his inner state as a response to the patient. His efforts to regulate his inner state showed the patient that he was with her: these efforts are simultaneously self-regulatory and communicative to the patient, presumably out of awareness of both.

**How are Qualities of Attachment/Affiliation/Intimacy Transmitted in Psychoanalysis?**

Because vocal rhythm coordination, facial mirroring, and distress regulation in infancy predict one year attachment, and remain operative throughout life; and because one year attachment predicts a transformational trajectory to young adult attachment, we propose that vocal rhythm coordination, facial mirroring, and distress regulation also carry qualities of attachment and intimacy in psychoanalysis, as organizing principles of implicit relational knowing.

In the case of Karen (treated by Lachmann) that follows, we concentrate on the implicit dimension of relatedness, although both implicit and explicit domains were important in the treatment (see Beebe and Lachmann 2002, for a full discussion of the case). Vocal rhythm coordination was used to reach Karen, who began her treatment with a suicide attempt. Facial mirroring of increments of sadness was also used to reach Karen, who was dissociated and remote. Karen's attempts at self-regulation of distress were extreme and unsuccessful, culminating in sleeplessness, listlessness, lack of desire, episodes of dissociation, derealization, and suicide attempts. Interactive regulation of distress occurred in the treatment of Karen through the analyst's facial mirroring of increments of sadness;
through the analyst's dampening and constriction of his own affective range so as to be closer to her range; as well as through verbal interpretation of what she was afraid to perceive, feel, wish, imagine, or remember, which facilitated an increased sense of agency in Karen. For her part, Karen was able to use these interventions to respond, to modulate her distress, and to find alternative self-regulation strategies. Much of this work took place in the implicit domain, out of awareness of the patient, and often the analyst.

**Clinical Illustration**

Karen began her 8-year psychoanalytic therapy, 3 sessions per week, after her first suicide attempt at age 27. When her then-boyfriend flirted with another woman, she took all the pills in her medicine cabinet as she watched her actions “from a bird's eye view from a corner of the room.” Her life had been declining since her graduation from high school, when her parents dragged her from her room to deposit her at an out-of-town college. She excelled in some of her courses, and barely passed others. After graduation, she attended a drama school in England for a year. Upon her return to the U. S. she looked for work as an actress, but her severe sleep disturbance turned her night into day and thus day into night. Unable to mobilize herself, she missed many auditions, callbacks, and even acting jobs when she did get hired.

Karen found it difficult to speak to me. She began sessions by asking, somewhat mechanically, “What shall we talk about?” I inferred her distress behind her affectless demeanor. So as not to increase her discomfort, I often responded by summarizing previous sessions, for example, “Last time we spoke about how messy and dingy your apartment is.” She might then speak about an apparently unrelated topic, for example, encounters with various acquaintances. Over a period of time I would then label these encounters as leaving her with feelings of abandonment, disappointment, a sense of exploitation, or regret about her withdrawn manner. I came to understand Karen's opening question as an attempt to orient herself and to determine whether or not a connection could be established with me. Overtly, Karen hardly acknowledged my presence, although her question, “What shall we talk about?” did contain “we.”

From the vantage point of the nonverbal, implicit organizing principles, her attempts at distress regulation were extreme, creating an imbalance: She
was preoccupied with self-regulation in the absence of interactive regulation. That is, efforts to regulate distress, regulation of affect and arousal, were severely impaired as evidenced by her sleep disturbance, listless state, lack of “desire,” and episodes of dissociation. Karen was born shortly after her parents’ graduation from high school. She recalled her parents’ nighttime fights and their regret that their future plans were scuttled by their marriage and Karen's birth. By the time she was 7, Karen had made a deal with God. She would give up her life if He would stop her parents from fighting. Thereafter she was preoccupied with suicide and suffered from severe, persistent sleep disturbances.

In high school, Karen frequently cut classes because she could not tolerate the noise made by other students. She would then spend the day studying alone. During afternoons and evenings she worked as a cashier at a local shopping mall. In fact, she worked continuously until the end of her high school years. Since then and until her treatment was well under way, she had not held a job. By the age of 17, Karen had formed an intimate sustaining relationship with a fellow student. When he unexpectedly died of a brain tumor, she was despondent. Her parents insisted that she get over her loss quickly. Instead, she retreated to her room, felt “without desires” and increasingly aimless.

When Karen began therapy, ten years later, these states were still prominent. Although we sat facing each other, Karen looked away from me. Her face was immobile. Her voice had no contouring. She kept her coat on. In response to Karen's extreme forms of self-regulation of distress, I dampened my facial expressions. Even when I spoke to her she did not look at me. Her self-constriction powerfully affected me. I felt reluctant to jar her precariously maintained presentation. To coordinate our vocal rhythms more closely, I partially constricted myself, allowing myself to be closely influenced by her rhythm, and narrowing my own expansiveness to more closely match Karen's narrow affective range. Many of these adjustments were made initially out of my own awareness. Only after discussing the treatment with Beatrice (Beebe) did I become more aware of them.

I looked at Karen continuously, but I kept my voice even and soft. In my initial comments I remained within the limits of the concrete details that she offered. I thus altered the regulation of my arousal, keeping it low. Gradually, her tolerance for positive, affective arousal increased and I could become more expansive. Our verbal and nonverbal range expanded. She
was able to talk about affectively more difficult material. Her voice remained soft but with more contouring. She spoke about social relationships and acting auditions that raised the specter of competition. She withdrew from these situations lest she draw attention to herself. Initially, these explorations had little effect on her life. Our dialogue, however, did increase the affective range that she could tolerate in the sessions.

Karen moved from descriptions of her environment, the inanimate world, to descriptions of interpersonal relationships, and to explorations of her subjective states. At the same time I also shifted from summaries of the previous sessions to elaborations of her feelings and reactions. Sometimes anticipating her formulaic opening, “What shall we talk about,” I began sessions by asking her how she was feeling. Sometimes, before verbally responding, her right upper lip would twitch and constrict briefly, or her leg would jiggle rapidly. Inadvertently, my face would take on a more somber quality, mirroring her distress. We came to understand Karen's signals as an indication that she was tense and had been feeling moody, depressed, or without energy since our last meeting. We focused on her specific reactions and searched for their context. I detailed nuances of feelings and moods such as annoyance, rebuff, eagerness, enthusiasm, or disappointment. It seemed to me that she experienced many emotions as annoying intrusions. After some time, I was able to add descriptions of Karen as “considering,” “hoping,” “planning,” or “expecting.” That is, I distinguished among categories of affect and time, and acknowledged her authorship of her experience. I kept pace with Karen's gradually more personalized communications. Nevertheless, her visible discomfort waxed and waned.

We discussed the vagueness that characterized much of her life as indicating what she was afraid to perceive, feel, believe, wish, imagine, or remember. My comments were directed toward facilitating her attempts at self-definition. In this way her prior, almost exclusive reliance on drastic self-regulation of distress on her own through withdrawal, depersonalization, and derealization began to shift. Her sense of agency increased. For example, as her dread of new situations diminished, she showed a wider variation of facial expressions. Occasionally, she smiled and my face brightened, too. Furthermore, she registered for, attended, and participated in some graduate school classes. Nonverbal mechanisms played a role throughout Karen's treatment. They interfaced with, amplified, and subsumed the many dynamic issues that were explored, such as her dread of alienating her
mother and the extent to which she sacrificed her health and comfort to maintain her attachment to her. Her suicidal preoccupation, her neglect of her physical well-being, her propensity to disregard physical illness, her social withdrawal and minimum functioning in life, her retreat from attention much as she desired it, all converged in her conviction that her parents' life would have been better off had she not been born.

During the first two years of the treatment, Karen missed at least one of her three weekly appointments and arrived late for the other two. When I gently inquired about this pattern, she told me that it was an achievement that she could get herself to the sessions as often as she did. Toward the end of the second year of treatment, Karen made a second suicide attempt. I had referred Karen for medication. But fortunately, the unused medication was not at hand. Instead, again she used whatever was in her medicine cabinet. Following this attempt, I met with Karen and her parents, but they could not grasp the severity of their daughter's difficulties.

I felt that Karen was still a high suicide risk and to wait to see whether or not she would arrive for her appointments became very anxiety arousing for me. I needed to feel less worried. Thus, at the beginning of her third year of treatment, I decided to telephone Karen about two hours before every appointment. I reminded her of the time of our meeting and told her that I looked forward to seeing her. Within about three to four months, Karen no longer missed sessions. In regulating my distress and in Karen's response, we attempted to mobilize a new interactive pattern.

**Conclusion**

Qualities of attachment, affiliation, and intimacy are transmitted in psychoanalysis in the implicit mode through patterns such as vocal rhythm coordination, facial mirroring, and distress regulation. These are all co-constructed patterns. Usually they occur out of the awareness of analyst and patient, as “hidden regulators” (see Coates 2002, Hofer 1994), but the analyst's awareness of them can promote therapeutic action.

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