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## BRIEF MOTHER–INFANT TREATMENT: PSYCHOANALYTICALLY INFORMED VIDEO FEEDBACK

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**ABSTRACT:** Specific patterns of interactive regulation documented by microanalytic methods of infant research can be applied to clinical interventions with mothers and infants. A brief treatment model is described that includes face-to-face split-screen videotaping (one camera on each partner) and therapeutic observation of the videotape with the parent. The intervention uses “video feedback” informed by a psychoanalytic approach, including positive reinforcement, modeling, and information giving, as well as interpretation, while watching the videotape. Specific interactions in the areas of attention, arousal, affect, and timing regulation are evaluated. The psychoanalytic intervention links the “story” of the presenting complaints, the “story” seen in the videotape, and the “story” of the parent’s own upbringing. An attempt is made to identify specific representations of the baby that may interfere with the parents’s ability to observe and process the nonverbal interaction. The mother’s powerful experience of watching herself and her baby interact, and our joint attempts to translate the action-sequences into words, facilitates the mother’s ability to “see” and to “remember,” stimulating a rapid integration of the mother’s procedural and declarative modes of information-processing. One treatment case, involving six contacts, is presented to illustrate the approach. By applying the specificity of interactive regulation identified by microanalysis of videotape into the psychodynamic treatment of mother–infant pairs, basic research can be translated into clinical practice.

**RESUMEN:** Patrones específicos de regulación interactiva, documentados por medio de métodos microanalíticos de investigación infantil, pueden aplicarse a intervenciones clínicas con madres e infantes. Se describe un breve modelo de tratamiento, el cual incluye una grabación en vídeo, cara a cara y con la pantalla dividida (sendas cámaras se enfocan en cada uno de los participantes), así como la observación

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terapéutica del vídeo con la madre. La intervención usa las reacciones al vídeo explicadas por medio de un acercamiento sicoanalítico, incluyendo un reforzamiento positivo, modelos, cómo dar información, así como la interpretación, mientras que se está mirando el vídeo. Se evalúan interacciones específicas en las áreas de atención, despertar, afecto y la regulación del tiempo. La intervención sicoanalítica entrelaza la historia de la presentación de las quejas, la historia vista en el vídeo, y la historia del propio crecimiento de la madre. Se hace un intento por identificar representaciones específicas del bebé que pudieran interferir con la habilidad de la madre de observar y procesar la interacción no verbal. La poderosa experiencia de la madre que se observa a sí misma interactuando con su bebé, y nuestros intentos conjuntos de traducir la secuencia de acciones a palabras, facilita la habilidad de la madre de “ver” y de “recordar,” lo cual estimula una rápida integración de las maneras de procesar la información que la madre posee, tanto de procedimiento como de declaración. Se presenta un caso de tratamiento, el cual involucra seis contactos, para ilustrar el acercamiento. Por medio de aplicar la especificidad de la regulación interactiva indentificada por el microanálisis de la grabación de vídeo, al tratamiento sicodinámico de los pares de madres e infantes, la investigación básica puede ser traducida a práctica clínica.

**RÉSUMÉ:** Des patterns spécifiques de régulation interactive documentée par des méthodes microanalytiques de recherche sur les nourrissons peuvent être appliqués aux interventions cliniques avec des mères et leurs nourrissons. Un bref modèle de traitement est décrit, incluant une prise en vidéo face-à-face avec deux écrans (une caméra sur chaque partenaire) et une observation thérapeutique de la vidéo avec le parent. L'intervention utilise des “remarques vidéo” fondées par une approche psychoanalytique, incluant un renfort positif, un modelage et une donnée d'informations, ainsi que l'interprétation faite en regardant la vidéo. Des interactions spécifiques dans les domaines de l'attention, de la stimulation (“arousal,” en anglais), de l'affect et de la régulation du timing sont évaluées. L'intervention psychoanalytique relie l’“histoire” de la présentation des problèmes, l’“histoire” vue dans la vidéo, et l’“histoire” de la propre enfance du parent. On essaie d'identifier les représentations spécifiques du bébé qui pourraient s'immiscer dans la capacité des parents à observer et décrire les interactions nonverbales. L'expérience frappante de la mère se regardant communiquer avec son bébé, et nos efforts pour traduire les séquences action en mots, facilitent la capacité de la mère à “voir” et à “se souvenir,” stimulant ainsi une intégration rapide chez la mère des modes de procédure et des modes déclaratifs de traitement de l'information. Un cas de traitement, comprenant six contacts, est présenté pour illustrer l'approche. En appliquant la spécificité de la régulation interactive identifiée par microanalyse de la vidéo dans le traitement psychodynamique de paires mère-nourrisson, la recherche de base peut se traduire en pratique clinique.

**ZUSAMMENFASSUNG:** Spezifische Muster der interaktiven Regulation, die durch mikroanalytische Methoden der Kleinkindforschung dokumentiert werden, können auf die klinische Intervention mit Mutter und Kind angewandt werden. Eine Kurztherapie, die mittels eines geteilten Bildschirms von Angesicht zu Angesicht (eine Kamera auf jeden Teilnehmer) aufzeichnet und dieses Band dann mit den Eltern ansieht, wird beschrieben. Diese Intervention verwendet „Videofeedback“ gesteuert von einem psychoanalytischen Zugang, der positive Verstärkung einschließt, Vorbildfunktion, Mitteilung von Information und Interpretation, während man das Videoband ansieht. Spezifische Interaktion in den Bereichen der Aufmerksamkeit, Wachheit, der Gefühle und der zeitabhängigen Regulation werden besprochen. Die psychoanalytische Intervention verbindet die „Geschichte“ des Präsentiersymptoms, die „Geschichte“, die man auf dem Videoband sieht und die „Geschichte“ der Erziehung des Elternteils miteinander. Ein Versuch wird gemacht die spezifischen Repräsentationen zu identifizieren, die auf den Elternteil einwirken können und auf dessen Fähigkeiten zur nonverbalen Interaktion. Die eindrucksvolle Erfahrung der Mutter sich und ihren Säugling interagieren zu sehen und unsere gleichzeitigen Versuche die Aktionssequenzen in Worte zu übersetzen, erleichtert die Fähigkeiten der Mutter zu „sehen“ und zu „erinnern“ und fördert dadurch eine schnelle Integration der mütterlichen Informationsverarbeitung. Ein Behandlungsfall bei dem sechs Begegnungen stattfanden, wird verwendet, um den Zugang zu illustrieren. Indem man die Spezifität der interaktiven Regulation, die durch die Mikroanalyse auf einem Videoband bestimmt werden kann in die psychodynamische Behandlung von Mutter – Kind Paaren integriert, kann man Grundlagenforschung in die klinische Praxis übersetzen.

抄録：乳幼児研究における微小分析法によって示された、特異的な相互作用調節パターンを、母親と乳児への臨床的介入にも応用することができる。(母子それぞれに1台ずつのカメラを用いる)対面の画面分割によるビデオ録画と、親と共に治療的にビデオを観察することを含む、短期治療モデルが記述される。この介入には「ビデオ・フィードバック」が使われる。これは、ビデオテープを観察している間の、精神分析的アプローチにより特徴付けられる。これは、解釈に加えて、正の強化、モデリング、および情報の提供を含んでいる。注目、覚醒 **arousal**、感情、およびタイミングの調節 **regulation** という領域における、特異的な相互作用が評価される。精神分析的な介入によって、表れている訴えの「お話 **story**」、ビデオテープに見られた「お話」、そして親自身の育てられ方の「お話」がつけられる。非言語的な相互作用を観察して分析処理するという親の能力を妨げるかもしれない、赤ちゃんの特異的表象を、明らかにする試みが行われる。母親が、自分自身と赤ちゃんが相互作用しているのを見るという強力な経験と、行為のつながり **action-sequence** を言葉に翻訳するというわれわれの共同の試みは、母親の手続き型 **procedural** 情報処理と宣言型 **declarative** 情報処理の急速な統合を刺激し、母親の「見る」能力と「想起する **remember**」能力を促進する。6回の接触のあった、一つの治療例が、このアプローチを明示するために、提示される。ビデオテープの微小分析によって明らかにされた相互作用の調節における特異性を、母・乳幼児ペアの精神力動的治療に応用することによって、基礎的な研究は、臨床の実践に翻訳されることができる。

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There is currently great interest in developing methods of intervention with mother–infant dyads in the first year of life. Psychodynamic approaches are generally aimed at maternal representations, addressing the declarative, verbalized mode of exchange (e.g., Cramer, 1995; Fraiberg, 1980; Hopkins, 1992; Lebovici, 1983; Provence, 1983; Seligman, 1994). Interactional approaches attempt to intervene into specific behavioral transactions, addressing the procedural mode of exchange (e.g., Brazelton, 1994; Malphurs, Field, Larraine, Pickens, Pelaez-Nogueras, Yando & Bendell, 1996; , McDonough, 1993; van den Boom, 1995). Other work integrates both approaches (e.g., Bakermans-Kranenburg, Juffer, & van Ijzendoorn, 1998; Greenspan, 1981; Lieberman and Pawl, 1993; Seligman, 1994; Stern, 1995). Bruschweiler-Stern and Stern (1989) argued that change in maternal representations is achieved equally effectively via interventions aimed at representations or behavior. In a review of a large number of cases, Cramer et al. (1990) concluded that both representational and behavioral approaches were effective. The dichotomy between psychodynamic, representational vs. interactional/behavioral approaches is increasingly being questioned (Cramer, 1998; Hofacker & Papousek, 1998). The current report is based on an integration of both approaches.

More rarely, some intervention approaches utilize feedback on videotaped interactions (see, e.g., Bakermans-Kranenburg et al., 1998; Cramer, 1998; Downing, 2001, Hofacker & Papousek, 1998; McDonough, 1993). Some of these approaches use the fruits of microanalysis in designing interventions (Malphurs et al, 1996; Stern, 1995; van den Boom, 1995). McDonough (1993) used video feedback to help families experience what is positive in their interactions. Cramer and Stern (1988) combined psychoanalytic intervention with microanalytic observation in a unique study of one mother–infant pair. Overall, however, the specific details of interaction patterns revealed by three decades of research using microanalysis of

videotaped mother–infant face-to-face play is a rich resource for principles of assessment and intervention that is underutilized in mother–infant treatment.

Our approach follows a theory of face-to-face interaction developed over the past quarter century, introduced into infant research by Sander (1977), and elaborated by Sameroff, (1983), Stern (1977, 1985, 1995), Trevarthen (1977), Cohn & Tronick (1988), Tronick (1989), Gottman (1981), Fogel (1993), Thomas and Malone (1979) and Beebe, Jaffe, and Lachmann (1992) among others. Self- and interactive regulation are concurrent and reciprocal processes, each affecting the success of the other. Interactive regulation is defined by bidirectional contingencies, a continuous process in which each partner makes moment-to-moment adjustments to the behaviors of the other. The infant’s capacity to detect and to be affected by contingent stimulation underlies all current theories of how the infant develops predictable patterns of relatedness and their representations (Bowlby, 1969; Gergeley & Watson, 1997; Stern, 1985, 1995; Trevarthen, 1977; Tronick, 1989). Self-regulation is defined by the capacity of the partners to regulate their respective states. This theory of interaction takes into account both how the person is affected by his or her own behavior, as well as by that of the partner (Thomas & Martin, 1976). Optimally, self- and interactive regulation are in dynamic balance. In the midrange, interactive coupling is present but not obligatory, and self-regulation is preserved but not excessive. For each partner, operating outside the midrange may index an attempt to cope with a disturbance in the interaction (Beebe, Jaffe, Lachmann, Feldstein, Crown & Jasnow, 2000; Isabella & Belsky, 1991; Jaffe, Beebe, Feldstein, Crown, & Jasnow, 2001; Lewis & Feiring, 1989). This theory of interaction is used to evaluate the procedural level of the mother–infant exchange. In general, this body of research studies face-to-face interaction. The regulation of feeding and sleep has received far less attention from researchers using this theory of interaction, with some important exceptions (e.g., Keener, Zeanah, & Anders, 1989; Sander, 1977).

The integration of self- and interactive regulation is important in the study of disordered interactions because of a tendency to locate the source of difficulty in one partner or the other (e.g., in early infant self-regulatory difficulties, or in maternal intrusion or insensitivity), rather than to identify the relative contributions of self- and interactive regulation of both. Despite important exceptions, many intervention efforts actually focus on the parent, to the point where Lojkasek, Cohen, and Muir (1994) asked “Where is the infant in infant intervention?” A unique study by Weinberg and Tronick (1998) evaluated the outcome of an early intervention in which only the mother was treated. They documented by microanalysis that the infants were still in distress even though the mothers reported improvement. Suggesting that the dyad should be a focus of intervention, they noted that the infant is often the “forgotten patient.”

Hofacker and Papousek (1998) argue that the infant’s contribution to the mother–infant interaction is still poorly understood. This imbalance may derive from our greater relative ease in verbal than nonverbal forms of communication. Microanalysis can teach us to observe the subtle, fleeting details of the mother–infant action language. This imbalance may also derive from the complex interweaving of self- and interactive regulation, addressed below. As Hofacker and Papousek (1998) note, it is often difficult to differentiate infant constitutional processing difficulties from maladaptive interactive patterns; furthermore, infant temperament and self-regulation are closely linked to interactive regulation. Thus, it is difficult to pry apart to what degree any infant self-regulation difficulties may be partially a function of a problematic interaction, and vice versa. Frequently, it is only after an intervention that it is possible to see the infant’s potential range of self-regulation and engagement capacities. Assessment of the infant with the stranger (described below) is helpful in assessing the infant’s range.

This article describes a model of parent–infant brief treatment. Microanalysis research describing face-to-face patterns will be reviewed first, providing a guide for assessing interactions. An approach to intervention that is psychoanalytically informed, and video-assisted,

will then be presented. This approach is illustrated by the case of Johann, with descriptions of the videotaped interactions that informed the interventions. The discussion argues that the mother's experience of watching herself and her baby interact, and our joint attempts to translate the action-sequences into words, facilitates the mother's ability to "see" and to "remember," stimulating a rapid integration of procedural and declarative modes of processing. Some mothers, however, require more extensive treatment (see Cohen & Beebe, in press).

### ***Microanalyses of Early Face-to-Face Interactions and Clinical Evaluation***

Microanalytic approaches have used contingency analyses of second-by-second coded behaviors (gaze, face, orientation, touch, and vocalization) during face-to-face play in the first six months to elucidate the microstructure of self- and interactive regulation patterns. Contingencies ("influences") are documented when one partner's behavior can be predicted from that of the other (see Cohn & Tronick, 1988). Analyses have focused on the regulation of affect, arousal, attention, and timing. Moment-by-moment, both mother and infant regulate their own states of attention and arousal, while at the same time influencing and being influenced by the changing behavior of the partner. Specific interaction patterns have been linked to infant social, emotional and cognitive outcomes (see Cohn, Campbell, Matias & Hopkins, 1990; Cohn and Tronick, 1989; Jaffe et al, 2001; Lewis & Feiring, 1989; Lyons-Ruth, Connell, Zoll, & Stahl, 1987; Malatesta, Culver, Tesman & Shepard, 1989; Sameroff, Seifer, & Zax, 1982; Tronick & Field, 1987).

Although this research linking early interaction patterns to outcomes is available to the mother–infant clinician, this work is currently in progress and official "norms" do not exist. The descriptions presented below are not prescriptive, nor do they assume one optimal mode of interaction. Ranges of "normal" interactions are more ambiguous than extremes of difficulty. Some of the problematic patterns described are used by all dyads at various moments, as aspects of early coping and defensive styles. All the problematic patterns can be conceptualized as potentially "adaptive" solutions to the dilemmas of specific interactions.

To make research on early interactions more available to the mother–infant clinician, the following areas of research will be briefly reviewed: (1) gaze, (2) face, (3) vocalization, (4) infant distress and self-comfort, (5) maternal touch, and (6) infant engagement with a stranger. Within each area, research is described, a relevant clinical vignette or treatment intervention is noted where possible, and finally I describe my approach to assessment, summarized in Appendix I. Although there are many ways of studying early mother–infant interaction, this review is limited to research using video microanalysis of the face-to-face exchange as it yields modes of assessing the interaction. It is most relevant to infants from two to nine months.

*Gaze.* Looking and looking away is a fundamental layer of the regulation of face-to-face interactions. Stern (1977, 1985) showed that mothers gaze most of the time, and it is the infant who "makes and breaks" the visual contact. Brazelton, Kozlowski, and Main (1974) showed that most mothers reduce their level of stimulation when infants look away, and increase it when infants look back. Infant gaze aversion functions as an important dimension of infant self-regulation, reducing arousal. Field (1981) documented that five seconds before the infant looks away, heart rate rises sharply over baseline; within five seconds after looking away, heart rate returns to baseline. Maternal difficulties in tolerating gaze aversions constitute an important disturbance of infant self regulation, noted below in "Infant Distress and Self-Comfort."

Two microanalyses based on frame-by-frame analysis of film have documented a "chase-and-dodge" pattern of misregulated gazing and head orientation (Beebe & Stern, 1977; Stern,

1971). In both, the mother had difficulty reading the infant’s gaze aversion as a cue to lower her level of stimulation (see also Alfasi, 1982). In the Beebe and Stern (1977) study, the mother “chased” by following with her head and body in the direction the infant had just moved, looming into the infant’s face, or pulling the infant’s arm to force a reorientation. At every maternal movement toward him, the infant moved away within a split second. Presumably the mother experienced difficulty in tolerating the momentary disengagement. Bower, Broughton and Moore (1979) showed that, in response to an object that is coming directly into the face, two-week infants duck their heads down and away, and put their hands up in front of the face.

Field (1977) showed that maternal decrease of stimulation during infant gaze aversion facilitates mother–infant interactions. Langhorst and Fogel (1982) predicted greater security of infant attachment when mothers reserved their stimulation for periods when infants were looking at them. In treatment dyads, a misregulation of maternal stimulation in relation to infant gaze is frequently observed. In van den Boom’s (1995) clinical intervention with irritable infants and their mothers, she specifically discouraged maternal stimulation when the infant looked away.

Landry (1996) has shown that, in dyads who come for treatment, instead of maintaining and elaborating on the infant’s focus, the mother substitutes her own focus, luring the infant away from his own agenda into her own, disturbing the infant’s initiative and agency. The infant often goes limp, giving up tonus, or may protest angrily.

In evaluating the interaction (see Appendix I), I observe whether the mother decreases stimulation when the infant looks away, increases stimulation only once the infant looks back, and uses “greeting” vocal contours (sinusoidal-shaped: see Fernald, 1993; Stern, MacKain, & Spieker, 1982) only while the infant is looking, rather than “calling” an infant who is looking away. I note whether mother attempts to force the infant’s return to vis-à-vis by pulling an arm or pushing the head. When the infant looks at an object (lights, a poster on the wall, or the sound of the camera), does the mother follow the infant’s line of regard and comment on what the infant is looking at, sharing the object focus (see Bakeman & Adamson, 1984; Stern, 1985)?

On the infant’s side, I observe whether the infant has both the capacity for sustained gazes, as well as a cycling of gaze on and off. An infant who rarely looks away may have difficulty using gaze aversion to regulate arousal (see Alfasi, 1982). Other atypical patterns include rapid, darting glances (see Murray & Trevarthen, 1985, 1986); looking with head “cocked” at an angle, as if ready to escape, or wary sideways glances (see Koulomzin, Beebe, Anderson, Jaffe, Feldstein, & Crown, 2002); “disorganized visual scanning,” never really focusing on the partner or an object (Tronick, 1989); or the necessity to self-comfort (self-touch, finger clothing, or oral) to sustain looking (Koulomzin et al., 1993). The nature of the infant’s visual “cut-off acts” (Beebe & Stern, 1977; Chance, 1962; McGrew, 1972) may indicate the degree to which the infant is working to regulate arousal within a comfortable range: does the infant look away but remain within a 60 degree angle from vis-à-vis, so that he has instant access back to the vis-à-vis position (Koulomzin et al., 2002)? Or is there an extreme orientation to a 90 degree cutoff, where the head is pressed to the shoulder (Stern, 1971, 1977)? Does the body arch away as well? Does the infant go limp, losing tonus, collapsing his head into his stomach (inhibition of responsivity) (Beebe & Stern, 1977)? Does the infant suddenly cease ongoing movement, becoming perfectly still, which is associated with maternal depression (see Murray, Fiori-Cowley, Hooper, & Cooper, 1996)?

*Face.* Although the popular term, “facial mirroring” suggests that mother and infant match each other’s expressions, the facial exchange is better characterized by elaboration (Fogel, 1993), echo or complementing (Trevarthen, 1977), rather than imitation (see Stern, 1985). Mothers and infants do not exactly match facial expression or level of affective engagement

(Malatesta et al., 1989; Tronick and Cohn, 1989). Instead, they match “direction of affective change” (Beebe, Lachmann, & Jaffe, 1997). Cohn and Beebe (1990) found each partner contingently responsive to the other’s facial exchange within one-half second or less.

Tronick and Cohn (1989; Tronick, 1989) suggest that we have idealized the concept of matching: instead mothers and infants are involved in a disruption and repair process involving sequences of match, mismatch and rematch. Pairs who rematch within two seconds are more likely to have secure infants at one year (Tronick & Cohn, 1989). The mother’s capacity to facilitate repair is an important area for further research.

Malatesta et al. (1989) analyzed maternal facial changes occurring within one second following the infant’s facial change, during face-to-face interactions in the middle of the first year. Degree of maternal facial contingency predicted infant attachment, with Secure infants predicted by midrange, and Avoidant by high degree of contingency. Unusual patterns of maternal facial response, viewed as “failures of facial empathy,” such as maternal joy or surprise to infant anger or sadness, predicted the toddler’s preoccupation with attempts to dampen negative affect (compressed lips, frowning, sadness).

In adults and infants, certain regions of the two cerebral hemispheres are differentially lateralized for processing positive and negative emotional stimuli. Davidson and Fox (1982) have shown that as an infant watches a video of a laughing actress, his brain shows the pattern of positive affect; watching a video of a crying actress, his brain shows a pattern of negative affect. Thus, *the infant cannot escape the face of the partner*: the mere perception of emotion in the partner creates a resonant emotional state in the perceiver. Considerable evidence shows that parental stimulation influences the organization of the infant’s brain (see Schore, 1994).

Field (1977) and Malphurs et al. (1996) experimented with giving mothers two different instructions: “imitate your baby,” or “get your baby’s attention.” In the imitation condition, intrusive mothers slowed down, became more attentive and contingent, matching the infant’s expressions and vocal contours. Instructions to get the baby’s attention helped less active mothers become more active, increasing infants’ attentiveness. Following Field, Van den Boom (1995) taught intrusive mothers to imitate the infant’s behavior. The nature of the intervention must be tailored to the particular pair (see also Hofacker & Papousek, 1998).

I assess whether the mother’s face is animated rather than relatively flat; whether she tracks the baby’s facial changes with her own; whether her facial changes convey empathy (“woe face” to infant distress, vs. Malatesta’s failures of maternal facial empathy); and whether she shows her baby (even fleetingly) distressed, frowning, grimacing, angry or mocking faces. Lyons-Ruth and Jacobitz (1998) note that mothers of infants classified as disorganized attachment are more likely to show the infant a frightened or frightening face, or to engage in an “affective error,” in which the mother’s face is positive while the infant is distressed.

On the infant’s side, I look for a full range of positive to negative expressions, rather than a constriction to neutral. Absence of positive or negative may index difficulty (Koulomzin et al., 2002; Weinberg & Tronick, 1998). Can the infant’s positive affect crescendo into a fully open-mouthed “gape smile” (Beebe & Gerstman, 1980; Stern, 1977)? Is the positive expressiveness not sustained, with abrupt “facial falling” to neutral (see Beebe & Sloate, 1982; Murray & Trevarthen, 1985, 1986)? Is there extensive negative affect, with strong frowns, grimaces, or tight lips (see Beebe, 2000; Cohen & Beebe, 2003; Beebe & Stern, 1977). And does the infant track the mother’s facial changes with corresponding changes of his or her own?

*Vocalization.* Compared to adult-directed speech, the timing of maternal speech is “infantized:” slower, in a theme and variation format, with shorter vocalization durations and longer pauses, with a tighter contingency structure. This gives the infant more repetition, less information, more time to process, and greater interactive predictability (see Jaffe et al., 2001; Stern,

1977). Field (1977) and Van den Boom (1995) taught mothers to repeat their own vocalizations as an intervention to create more predictability for the infant. Jaffe et al. (2001) found that mothers and infants tend to “match” (correlate) level of vocal activation (relative time vocally “on” to “off”), which provides each partner with a sensitive way of tracking the other’s level of arousal, and can be “taught.”

Vocal contour conveys important emotional information. Fernald (1993) and Stern et al. (1982) have described more positive contours as “sinusoidal,” whereas more negative contours have a short, downward shape. The former are used by mothers to convey approval, and the latter disapproval, across cultures (Fernald, 1993).

Vocal content is also an important dimension. Fraiberg (1980) described the clinical significance of baby games where the content is aggressive or sexualized. Murray, Kempton, Woolgar, and Cooper (1993) showed that depressed mothers are more critical and focus more on themselves than their infants. Using an elaborated version of Murray et al.’s coding, Kaminer, Beebe, Jaffe, and Kelly (2000) showed that mothers who were less vulnerable to depression tended to accord their infants “action-agency” (e.g., “oh, you’re trying to get comfortable”) while their infants were looking at them, incorporating the agency within the mutual visual engagement. Mothers who were more vulnerable to depression tended to accord their infants action-agency when the infant was looking away. From the infant’s side, an inhibition of vocal distress characterizes the infants of depressed mothers (Anderson, Beebe, & Jaffe, 1996), as well as infants in the “still-face” experiment (Weinberg & Tronick, 1996).

Jaffe et al. (2001; see also Beebe et al., 2000) predicted one-year attachment outcomes from four-month degree of mother–infant and stranger–infant vocal rhythm coordination. Midrange degree of vocal contingency predicted secure infant attachment, whereas high and low degrees of contingency (hypervigilant or inhibited) predicted insecure. The Jaffe et al. study is paralleled by other research which points to a “midrange model” in the prediction of optimal attachment outcomes (see Isabella & Belsky, 1991; Lewis & Feiring, 1989; Malatesta et al., 1989).

In assessing maternal vocalization, I note whether the mother has a vocal prattle (vs. silent), “infantized speech” (vs. an adult pattern); and vocal contours of approval (vs. disapproval). I observe whether the mother decreases her vocal stimulation when the infant looks away, and whether the mother tends to coordinate her own rhythms and contours with those of her infant. On the infant’s side, is there vocalizing (or silence); is there a range of positive and negative sounds; and does the infant coordinate with the mother’s vocal rhythms? I note an inhibition of infant distress, as well as frequent fussiness, whimpering or crying. The infant’s temperament is investigated in this context (see infant temperament below).

*Infant distress and self-comfort.* 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 (1976) and Brazelton (1994), 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 three to six 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 until 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 re-



sponded to the other's distress with a reciprocal escalation, each "topping" the other, until the infant vomited, was described by Beebe (2000). Ainsworth, Blehar, Waters, and Wall's (1978) classic study showed that maternal unresponsiveness to infant crying differentiated insecure as opposed to secure attachment. Del Carmen, Pedersen, Huffman, and Bryan (1993) found that mother calm/soothe in response to infant fuss/cry at three months predicted 12 month secure infant attachment.

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; Gergeley & 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 reengage (see Cohen & 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 Lyons-Ruth & Jacobitz, 1998; Malatesta et al., 1989). 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. Further research is necessary in this area. Intervening in a group of infants irritable from birth, van den Boom (1995) found that mothers frequently attempted to reduce interaction to a minimum with their irritable infants, to prevent crying. Van den Boom specifically taught mothers to soothe their infants, carefully tailoring the technique to the infants' response, and she succeeded in altering infant attachment outcomes.

In assessing the mother's approach to her infant's distress, I observe 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. Escalating overarousal patterns, "affective errors" (showing positive response to infant distress), or verbal denial of infant distress, are important to note. I also inquire into patterns of infant temperament, alert to difficulties the baby may bring to the relationship (see DeGangi, Di Pietro, Greenspan, & Porges, 1991; Greenspan, 1981; Korner & Grobstein, 1977; van den Boom, 1995). I address the pregnancy, delivery, and postpartum period, and any history of sleep, feeding, arousal difficulties, or special sensitivities to sound, smell, or touch. I observe the infant's degree of facial or vocal distress (see "Face" and "Vocalization" sections above), as well as capacity for self-comfort, noting either an absence of, or a preoccupation with, self comfort. Following Tronick (1989), I evaluate disturbances of infant self-comfort by autonomic distress (hiccuping; vomiting) and disorganized visual scanning, as well as pulling the hair or ear, or history of head-banging.

On the mother's side, I observe whether she disrupts infant attempts at self-comfort, by disrupting infant movement of hand to mouth, pulling the infant's hand out of the mouth, or removing a cloth or strap that the infant may be fingering. Additionally, does the mother rather continuously put her own finger in the infant's mouth, so that the infant may have difficulty learning self-comforting behaviors; or does she do "oral teasing" (putting her finger into the infant's mouth, then rapidly withdrawing it) (see Beebe, 2000)?

*Mother touch.* Maternal touch is associated with growth hormones in prematures and the development of affect regulation and security of attachment (Ainsworth et al., 1978; Egeland & Farber, 1984; Field, 1994; Stack & Muir, 1990). Stern (1977) argued that repetitive maternal games of touch, with “theme and variation” format, help create expectancies for the infant. Maternal touch is also a primary means of soothing a distressed infant, and extra handling is associated with diminished irritability (Korner & Thoman, 1972). On the other hand, some infants with difficult temperaments do not tolerate a great deal of touch (see DiGangi et al., 1991). Cultural variations in maternal touch patterns (see Stepakoff, Beebe, & Jaffe, 2000) are important to take into account. An absence of any maternal touch games, or continuous nonstop touch games, can index under- or overstimulation. Continuous picking at the infant’s face and clothing can be intrusive. Going into the infant’s face with frequent stroking, kissing, tickling, looming, or pinching can also be intrusive (see Alfasi, 1982; Beebe & Stern, 1977; Stern, 1977).

*Infant engagement with stranger.* There is little microanalysis research on stranger–infant face-to-face interactions. Bigelow (1998) found that infants “prefer” in the stranger the expected range of contingency that they experience with their mothers. If the stranger operates outside the mother’s contingency range, infants are less contingently responsive to strangers. In contrast, using different microanalysis methods, Jaffe et al. (2001) found that, with the novel stranger in a novel lab setting, infant and stranger generate more mutual predictability than mother and infant at home. More research is required in this area.

Comparing depressed and control samples, Field et al. (1988) showed that infants of low SES depressed mothers acted “depressed” with a nondepressed adult stranger, whereas control infants did not generalize their interaction pattern with mother to a stranger. When interactions are more difficult, infants may develop expectancies of interactive regulation that are sufficiently “rigid” that they may generalize to an unfamiliar partner. The strangers themselves showed less activity and more flat affect with infants of depressed, compared to control mothers. Weinberg and Tronick (1998) replicated aspects of the Field et al. (1988) study. Infants of mothers with severe obsessive–compulsive disorder, depression, or panic had more negative interactions with their mothers (less interest, more anger and sadness, and more fuss/cry) than controls. Proband infants showed the same patterns with strangers. Blind to the infant’s status, the strangers themselves were more disengaged with proband infants than with controls, maintaining greater physical distance, and avoiding arousing touch. Both the Field et al. (1988) and the Weinberg and Tronick (1998) studies suggest that the stranger’s behavior with an infant may be an important clinical tool.

The infant’s capacity for engagement with a trained female “stranger” is an essential ingredient of my assessment. If the interaction with the mother has been stressful, can the infant “repair” with the stranger, or does the interaction remain difficult? Similar to the assessment with the mother, I assess whether the infant with the stranger is capable of sustained gazes with a look-look away cycle, rather than “obligatory attention” (Stechler & Latz, 1966) or avoidant patterns. Can the infant display a range of positive to negative affect with the stranger (vs. “neutral” face, inhibited vocalization, or extensive negative expressions)? Does the infant self-comfort in the midrange (vs continuous self-comfort attempts or none)? Is the infant’s arousal generally moderate (vs. fussy, foot pumping, squirmy overarousal; or severe dampening of arousal with loss of tonus, collapsed into the stomach with limp head-hang, or sudden stalling). Before the last quarter of the first year, infants are intensely interested in the “novel” partner, so that the stranger has an initial advantage over the mother in “interesting” the infant. I also assess whether the stranger seems “wary,” or “careful” not to overarouse the infant.

### *Video-Assisted, Psychoanalytically Informed Intervention*

Mother–infant treatment occurs at a unique intersection of implicit “procedural” (repetitive action-sequences) and explicit “declarative” (symbolic) modes of processing, and it fosters a greater integration between the two modes. (1) In the procedural mode, how does each partner affect the other? (2) In the declarative mode, what can the mother verbalize about either of these directions of influence? (3) Does the mother’s representation of the infant interfere with her ability to perceive her own nonverbal behavior as it affects and is affected by the infant?

In dyads presenting for treatment the mother can usually observe at least some of the infant’s behaviors that impact on her, and can verbalize them (e.g., my baby does not smile at me, my baby turns away). Very often, however, the other half of the mutual influence equation is missing: mothers have difficulty observing, much less verbalizing, their own behaviors, which impact on the infant. Although observation of one’s own nonverbal behavior is difficult for everyone, the mother’s representation of the infant may disturb this process even further.

The initial contact is a 15–20 minute telephone conversation with the mother, in which I solicit presenting complaints and explain my videotape approach. The first meeting is a lab visit. Infant with mother, stranger, and possibly father or nanny are videotaped in face-to-face interaction with two cameras, one on each partner’s face and upper body. A split-screen integrates the two images into one view. The instruction to the parent is to interact with the infant as she or he would at home. The treatments generally involve two to four lab visits, each of which is followed by a two-hour feedback session in my psychotherapy office. The last lab visit generally includes an attachment test, coded by someone blind to the infant’s status. I prefer to see infants as young as possible. The typical age at entry is five to nine months, and the treatment is generally concluded prior to the infant’s second birthday.

A two-hour block of time is set aside to view the videotape with the mother (and father if available). This amount of time greatly facilitates the work. Prior to the meeting I have reviewed the videotape in detail and evaluated attention, arousal, affect and timing regulation. I follow the parent’s lead in the format of the meeting, beginning with current issues, history, or the videotape. Usually a long initial conversation precedes the videotape, during which I gain an overview of the current complaints in relation to the parent’s own functioning and history. If the history does not emerge, eventually I inquire. Often there is more mileage in this inquiry during or after watching the videotape together. If the parent hesitates to watch the videotape, I inquire carefully but do not urge it. In the three dozen cases that I have seen, only one mother has refused to view the tape, and in that case I simply used my own microanalysis to inform the interventions.

Along with the ongoing psychoanalytically informed conversation, the videotaped parent–and stranger–infant interactions serve as one source of clinical information, and as a departure for interventions. My version of video-assisted intervention involves a very detailed evaluation of the small micromoments of the interaction, particularly the moments that go well, as well as the moments that derail. My goal is a clinical translation of the specific details of interaction patterns revealed by microanalytic research studies into terms that the mother can absorb.

We view the videotape slowly, trying to see exactly when and how and in what sequence the baby smiled and cooed; or avoided, frowned, fussed, or arched away. I inquire into what the mother felt at that moment, and what she thinks the baby felt. Together we try to describe what we see. The positive aspects of the interaction are emphasized, teaching the mother to see details of how the interactions flow. One of my essential functions is to admire the pair wherever possible. Facial expression and vocal contour, rhythm, pacing, pausing, infant self-regulation, and self-soothing, and distress regulation are illustrated as these occur in the interaction. The discussion of the videotape emphasizes what works in keeping this infant optimally

engaged, raising parental awareness of the infant’s ability to give and respond to minute, but nevertheless identifiable, cues. We observe the effects of maternal behaviors on the infant, the effects of infant behaviors on the mother, and particularly the meaning these interactions have for the mother. Where appropriate, mothers are informed of research findings (where possible with a drawing) that may help them understand the infant’s behavior, shifting attention to infants’ capacities.

In the course of watching the videotape, together we describe the interaction in such a way that the mother can often graphically formulate the problem herself. My role is to help put into words the nature of the difficulty, and often to give her permission to do less, to slow down, to wait (e.g., after the infant has turned away). One central goal is to increase awareness of nonverbal behavior. Often the mother herself offers a spontaneous insight linking her own childhood history to the scenario on the videotape. For example, one mother declared, “Oh my goodness, here I am setting the pace, and setting it too fast. That’s what my mother did with me! I can’t believe that I’m doing it with my own baby!”

In attempting to link the “story” of the presenting complaints with that of the videotape, as well as that of the parent’s own upbringing, an effort is made to understand what may be preventing the parent from fully “seeing” the interaction with the infant. Specific representations of the infant (or “transferences”) are identified where these seem to prevent the parent from seeing his or her effect on the infant, or vice versa. Following the video-assisted intervention, the parent is encouraged to go home and relax, to trust that she or he has understood something, and to try not to be too self-conscious. Another videotaped assessment is scheduled in a month or two, and at the appropriate age (12–18 months), a Strange Situation attachment test. Further parent psychotherapy may be encouraged where indicated.

The mother in the case presented below was referred to my private practice of psychotherapy and psychoanalysis by her own therapist. Although the father was welcome, he chose not to be involved. The mother was well educated, very intelligent, and until the baby was born had worked as a high-powered legal assistant. Most likely her own experiences in therapy had enabled her to become aware of the difficulty with the infant, and to seek help. Most of the mother–infant cases I have treated fit this picture. In this sense they are probably not typical of the broader range of women who might seek mother–infant intervention. Nevertheless, mothers seeking help with an infant are intensely motivated and receptive (see Fraiberg, 1980).

### ***The Case of Johann***

In the first telephone conversation, Mrs. J. worried that her six-month-old son, Johann, was “gaze avoidant, arching away, not interested in me, and not smiling as much as other babies.” There was an early nursing difficulty, with possible allergy, and colic: “He cried all the time from the moment he was born.” In the morning he would wake up “frantic, arms flailing, wanting to have eaten 10 minutes ago.” By three months she noticed that Johann “arched back and pulled away,” often when eating. The baby had low tolerance for hunger and stimulation: trucks and noise made Johann cry; he was better on a quiet street. Johann had difficulty sleeping and mother was starting the Ferber method. Mrs. J herself felt sleep-deprived and seemed frantic.

#### ***First Contact: Lab Visit: Johann Six Months.***

*Microanalysis of first two minutes of mother–infant face-to-face play.* As mother said “Hi, Johann,” he glanced at her for a split second and then away, fingering the cloth on his infant

seat. Mother said, “Hi Johann, look at all this interesting stuff,” with a sinusoidal vocal contour, then shook his hand, and called his name again. Johann looked with a big smile, and immediately looked away. Mother then sang a familiar “beep, bop” song, while Johann looked away, fingering the cloth. Mother shook the hand that had been fingering the cloth. With no response, mother twisted her head around, close in toward his face, asking, “what are you looking at?” Johann looked for a fleeting moment, then rapidly averted. Mother sang the “beep, bop” song, and called his name. Johann looked briefly, and immediately averted, fingering the cloth.

Mother pulled the hand that Johann had been using to finger the cloth, said “Hello,” then fingered his cheek, saying, “We’ve had gaze aversion before but nothing like this.” Johann pulled his hand from mother’s grasp, looked for a second, then arched back and averted to 90 degrees. Mother asked, “what’ cha looking at over there?,” resumed the beep-bop song, and then twisted around to see what Johann was looking at. Johann oriented and looked at mother for a split second, and then arched completely back to a 90 degree avert, fingering the cloth. Mother responded, “How *are* you? You don’t want to look at me, do you, what’s going on?”

Mother took Johann’s hands, which had been fingering the cloth, and began to sing, “The wheels on the bus go round and round,” swinging his arms. Simultaneously Johann arched away 90 degrees. Mother kept going without skipping a beat. Mother stopped singing and asked, “What c’ha looking at, that doll?” Mother took Johann’s hand and he pulled it out of her grasp, arching to a 90 degree avert. Mother said, “Do you hate your chair?” Johann arched away again, then fussed. Mother picked him up, then put him back down, saying “What, what, what’s the matter?” Johann arched and fussed. As Mother picked him up, he again averted 90 degrees. Mother said “What’s *with* you? You don’t want to look at me at *all*.” (first two minutes).

In the rest of the interaction, Mother was most successful in engaging Johann during a rhythmic “boop/boop” song. Johann gazed for 10 seconds, and smiled. But then mother interspersed a striking series of movements into his face as she sang, gently going “boop” on his nose 26 times. To each “boop” Johann blinked, sobered, frowned, then looked away. Eventually Johann began to arch in a wildly avoidant way. By the end Johann lay limp on his side, fingering the material on his infant seat. As I came in Mrs. J declared, “Well you experienced something *worse* than I ever experienced. If he were like this every day I’d be beside myself.”

*Commentary on mother–infant interaction.* Johann’s looking pattern was one of brief, darting glances followed by abrupt and extreme orientational aversions. The only sustained looking occurred during the boop/boop song. Johann fairly continuously fingered the cloth of the infant seat, suggesting an ongoing attempt to self-regulate heightened arousal (see Tronick, 1989). When mother disturbed Johann’s self-regulatory fingering by taking his hands, he pulled his hands free of her grasp. At times his avoidance escalated into frantic arching away.

Mother was working hard to engage Johann, operating at high arousal, rarely pausing, but her face was flat. Although she “called” Johann when he was not visually engaged, her vocal contours were initially sinusoidal. But as the session went on, mother’s voice was monotonous, then irritated. But she was able to match the rhythm of some of Johann’s distress sounds.

Mother did not read Johann’s gaze and orientational aversions as signals to “cool it.” Instead, to each aversion, she called him, pulled his hand, or tried a new song. Mother went into Johann’s face, fingering his cheek, following with her head and body, chasing him. She seemed desperate to reach Johann, and so frustrated that she could not. Overall, she would have had a better chance of engaging him if she were slower, paused more, and waited out the periods of infant gaze aversion without “chasing.” She might also have varied her face and voice more, and matched the rhythm of Johann’s vocalizations more.

*Microanalysis of stranger–infant interaction.* I played with Johann for three minutes. He was oriented away 30 degrees, looked briefly for three seconds, looked away and then back for another three seconds, fussed, looked away, then looked back for five seconds. Concurrently I made small, soft sounds, synchronizing with his head movements, and said “Hi, hi,” with a softly modulated partial mock-surprise expression, each time he looked. Each time he looked away I became quiet. In retrospect, my rhythm at the very beginning was a little too fast. As I slowed down, gently saying “hi” and moving my head up and down very slowly, he sustained a gaze for 25 seconds, with a neutral face, fingering the cloth. He then alternated several times between looking at me, each time for four to five seconds, and moving his head down or averting to 90 degrees.

Johann was alert to the sound of the camera, orienting toward the slightest sound. I shared his focus, orienting in the direction of his attention, softly saying, “What’s that (pause), what’s that?” He looked at me for five seconds, sober-faced, fingering his clothing, while I said “Hello” with a sinusoidal vocal contour. Twice more he dipped his head down and back up to look at me, fingering the cloth, sober-faced. Each time I softly said, “Hello.” Then he looked at me for 19 seconds, sober-faced, fingering the cloth. I made slow head movements up and down, gently saying, “Hi, hi.” He then began to fuss. I put my hand on his stomach to see if that would help him regulate. He made three rapid 90 degree aversions, swinging from side to side, and suddenly began to cry, arching back strongly. I put him on my lap, softly vocalizing in rhythm to his cries, but I could not soothe him. I stopped there. When mother came in, he calmed right down.

*Commentary on stranger–infant interaction.* Johann’s fingering the cloth suggested a high level of arousal. He used my slower stimulation to calm down, and to keep returning briefly to a visual engagement. Overall, this interaction revealed more of Johann’s capacity for engagement. Nevertheless, he showed a partially avoidant pattern, and constricted facial affect.

While watching me interact with Johann, mother commented to the research team that Johann was saying to me: “What you are doing is not funny; I am so smart and tired of your foolishness.” Afterward Mrs. J. told me: “Everything you did escalated him and made it worse and now he’s angry. I’ve never seen him this avoidant; I don’t know if he is angry with me for the ‘Ferber’ technique. I’ve never seen him as bad as he was here: much worse than at home.” However, Mrs J. noted that at home he arched away as well, and pulled at his hair or his ear.

After the filming, Johann interacted well with the research team from a distance, without looking at his mother, perfectly calm and contented. When I noted that he seemed to be happy now and interacting well, when he had more space, Mrs J. agreed: “Johann responds better if I put him on the kitchen counter, or on the floor; if one of us is holding him, he interacts with the other parent.” Following the filming, mother fed Johann facing outward, rather than held at the breast. When I inquired, Mrs. J. said, “If I snuggle him in, he arches back and pulls away.”

*The first intervention* was made immediately. Although I usually wait for the feedback session, I felt Mrs. J. needed something right away. First I emphasized their strengths: Mrs. J. had already figured out many critical things about this baby and what to do for him. Outside of the filming chamber, he did not seem unhappy. Mrs. J agreed: Johann *used* to cry all the time but doesn’t now. I emphasized how hard it had been for both of them when Johann was born. From the beginning, he had a difficult temperament: he overaroused easily, was fussy and irritable, had difficulty eating and sleeping, and had trouble tolerating hunger and noise. I told Mrs. J. that looking away, arching away, pulling his hair, and tugging at his ear were all signs of a baby who was having trouble regulating arousal into a comfortable range. These

were Johann's attempts to self-comfort, which had gotten very intense. A baby who easily overarouses may look away a lot to try to calm himself down. But these methods of regulating are hard for the mother: it is easy to feel rejected. Mrs J agreed: "I do feel I must be doing something wrong. He is so much easier with my husband. I sometimes worry that he does not like me."

I then suggested that this kind of baby, who easily over-arouses, will not respond well on demand. In his own time, given his own space, he is easier. I asked Mrs. J to try not to equate Johann's looking away with the idea that he does not like her, or is not interested in her: he is just trying to calm himself down. I suggested that she try to lower her level of stimulation: "Go slow, keep your tone soft as you did at the beginning of the filming. Try to give him space: try not to go into his face. He seems to be very sensitive to that." I explained that babies have a built-in protective mechanism to prevent anything from coming into the face. I described that in experiments where an object is slowly moving in toward the face, babies put their hands up and move their heads down and to the side (see Bower, Broughton, & Moore, 1970).

*Dynamic issues* were evident in this first filming, which I did not raise at this time. Mrs. J. called herself a "nervous person." She talked continuously, with many ideas and questions, rapidly changing topic, flooding the team in the way she herself seemed to feel flooded. She felt insecure about her baby's love for her. She was in pain about the idea that Johann was not interested in her, liked her husband more, and that she was "not doing it right." In fact, everyone seemed to be "not doing it right": Mrs. J. felt that the baby was telling me that I was not doing it right; and that the baby himself was not doing it right, by arching away. I did not comment on this theme to Mrs. J. but I speculated that she projected that Johann was angry at me, the way she felt he must be angry at her. I hypothesized that she was angry at Johann for making her feel inadequate. She had trouble acknowledging what she did well with him, and similarly, what I might do well with him. She seemed to feel humiliated for having so much difficulty. I was sensitive to how difficult it must be to bring her baby to a stranger who might "do it better," and what it might mean to tell me that I "made it worse." She seemed angry at me as well.

### ***Second Contact: Lab. Johann Seven Months (One Month Later)***

Mrs. J. felt that the first visit was an "aberration:" Johann had never been so avoidant. She preferred to film again before we met to watch the videotape. I followed her lead. In this second lab visit she described how difficult Johann's sleep disorder had been: they were up every night every hour or two. But now, the "Ferber" method had worked and both mother and baby were sleeping through the night. Johann was avoidant now only when tired. Before, he was like that all the time. Mrs. J. *had* been worried sick that something was wrong, but now perhaps the whole problem had just been a sleep problem. I did not challenge this. Resolving the sleep problem surely had a positive impact, but that was not the whole story.

*Microanalysis of first two minutes of the second mother-infant filming.* Johann looked at the door, fingering the cloth of the infant seat, as the research assistant was leaving. Mother said, "Say bye-bye," took the hand that Johann was using to finger the cloth (disrupting his self-soothing), and waved it, saying, "Bye-bye," with moderate facial animation and vocal contour. Johann glanced at mother and looked down. As he looked, mother said "Hi." The moment he looked down, mother said, "You don't want to sit there, do you." Johann fingered the cloth, looking down. Mother said, "Hi sweet'pea, What do you see? the ruffle?" Johann sneezed, and darted a glance. Mother said, "Bless you, hi sweetie," with lilting vocal contour. He looked

down. At this point (25 seconds into the session), there was an interruption to adjust the microphone.

As the session resumed, Johann was looking down, head oriented toward the door, fingering the cloth. Mother again took the hand that was fingering the cloth and waved it, saying “Bye-bye” to the research assistant. Mother said, “Hi Johann,” but there was no movement or response. Mother then sang, “Boopdedoo,” twisting around, trying to move into Johann’s visual field. He darted a glance from the periphery, and immediately looked down. Mother said, “Hi Johann, how are you?” He oriented away 90 degrees. Mother said “Peek-a-boo,” using a sinusoidal (flirting) vocal contour, hiding her face with her hands. Johann looked at mother for eight seconds, while mother said, “Hi, swee’pea, how are you?” Then he swung his head through the vis-à-vis to 90 degrees away in the other direction. Mother said, “You want to get out of your chair, *don’t* you” (without a question intonation). Johann looked briefly, then arched, looking up. Mother said, “You hate your chair.” Johann moved his head way down, without looking at mother, and began fingering the cloth.

Mother sang, “Beep, bop, boom, bop.” Johann looked briefly, then looked down, his fingers gently hitting the chair. Mother sang, “I’m going to bake a cake, and I’m going to put you in it: — No! I’m not going to do that!” As mother reached the phrase, “and I’m going to put you in it,” Johann arched 90 degrees. As mother said, “No, I’m not going to do that,” Johann sharply moved his head center and down. Mother called “Johann,” four times, taking his hands in her own. Johann moved his head down, pulled his hands from her grasp, and fingered the cloth. Mother said, “What are you looking at?”, took his hands, put a finger on his cheek, shook his body gently, and repeated, “What are you looking at?” (One min, 50 seconds) In the last minute and a half, mother was successful in engaging Johann in a peek-a-boo game. But eventually he became fussy, arched, and cried angrily. At this point I stopped the filming.

*Commentary on the second mother–infant filming.* Johann was avoidant, but not frantically arching away until the end. His looking was somewhat more sustained, compared to the darting glances of the first session. His use of 90 degree aversion, and his preoccupation with self-soothing, were somewhat less. He did not smile, but he had small fluctuations of mouth opening and pursing (see Bennett, 1976). Mother was still working hard, rarely pausing. She matched some vocal rhythms and vocal contours. But she attempted to engage Johann when he was not looking, by calling, singing, playing peek-a-boo, or chasing. However, unlike the first filming, when Johann was engaged with something else, such as the ruffle, mother could follow his visual line of regard and comment, sharing an “object-focus.” And mother was able to use the peek-a-boo game to engage Johann. Unlike the first filming, Mother did not go right into Johann’s face. She disturbed self-soothing frequently, most strikingly as she took the hand Johann was using for self-comfort to wave good-bye. Mother was not able to sit back, and wait, until Johann signaled readiness. Overall, however, this session was better than the first. Mrs. J. commented, “The lab brings out the worst in me, I get anxious, and then he is anxious.” She felt Johann was “all over the place” and that she had not been able to engage Johann very successfully. I said I thought that the second filming was easier for them both.

*Microanalysis of second stranger–infant filming, three minutes.* Johann was looking down, fingering the cloth of the infant seat. I was quiet. He looked briefly, and I said “Hi (pause), hi (pause)” with a soft, sinusoidal contour. He looked down, then looked at me for five seconds, with a small partial smile, as I moved my head up and down slightly, saying “Hi, hi.” He looked down and fingered the cloth. His hand then gently and repeatedly hit the arm of the infant seat. Meanwhile I was silent, not moving. Johann looked at me for four seconds, looked at the ceiling, then looked at me again with a small kicking movement. I briefly matched the



kicking movement with a similar rhythm in my own body, but did not vocalize. Johann looked for six seconds while I did this and smiled briefly. Then he looked down, fingered the cloth, then gently hit the side of the chair with his hand, while I became quiet. He fingered the cloth, then looked up at me. I vocalized in a rhythm that matched that of his hand hitting the side of the chair. Johann sustained this gaze at me for 26 seconds, while we engaged in an alternating dialogue, each matching the other's rhythm, Johann by gently hitting the chair, and I by vocalizing.

Summarizing the third minute, Johann oriented around 180 degrees to look for the microphone wire. I waited, quiet. Then he reoriented and looked at me, and smiled. I said, "Hi, hi, hi," in a slow rhythm. Gradually he began to fuss. I matched the fuss rhythm. He held himself at the edge, without disintegrating into a full cry. I then stopped the filming.

*Commentary on second stranger–infant interaction.* Johann was more responsive to me in this second visit, and his gaze was more sustained. I was careful to keep my voice low, my movements slow, to wait, and to do a lot of pausing. He responded well to my crossmodal matching, a form of affect "attunement" (Stern, Hofer, Haft, & Dore, 1985). Although he still spent a fair amount of time not looking, he was able to use my "waiting without pursuing" to reengage. He smiled. His capacity to use my matching of his fuss rhythm to hold himself at the edge without going over into a full cry was an impressive moment of self-regulation. Mrs. J and I ended the visit with an agreement to meet the next week to review the second videotape.

### ***Third Contact: Psychotherapy Office. Johann Seven Months***

One week later we met in my psychotherapy office for a two-hour session. This was our first meeting to review the videotapes. I left it up to Mrs. J. as to whether she wanted to bring Johann, and she did. He was responsive to me as they came in the door. I was charmed by him, and showed Mrs. J. my admiration. I noted to Mrs. J. that she herself looked better and seemed calmer. She agreed, and reported that she and Johann were sleeping fine. At this point in the session Johann made an overture to me, and Mrs. J. encouraged him to sit on my lap. As I played with the baby while talking to the mother, I had in mind the nature of the interventions that would become apparent in the video review. While conversing with Mrs. J. about how things were going, I casually commented on my own play with Johann, such as, "When he looks away like that, if I don't chase him, I think he'll come right back to me. Let's watch and see what he does."

We reviewed a few minutes of videotape from the second lab visit. Mrs. J. did not want to discuss the first videotape, because she felt it had been such an aberration. I focused mainly on what Mrs. J. was doing that was successful in engaging Johann. I pointed out moments when there was a richness and an aliveness in her voice, as critical ways that the baby senses her emotions. I admired moments when she sensed the contours of Johann's voice, or his rhythms, and to match and elaborate on them, commenting that matching gives Johann the sense that she is "with" him. I emphasized that Johann does not have to be looking to be able to sense her vocal matching, so this is an important way of reaching a baby who is having trouble looking. I commented that Mrs. J.'s face was more animated in this second session, again giving Johann the sense that she is "with" him. I pointed out her ability to follow Johann's line of regard, sharing whatever he was interested in.

Among my comments admiring her responsiveness, I interspersed the idea that in general, slower, calmer, and lower volume stimulation will be more effective with Johann, because he spent the first six months overstimulated. I tried to give Mrs. J. "permission" to pause, to relax, to not work so hard, and to *wait* if Johann is occupied elsewhere. I explained the idea of giving

him control over the level of stimulation, and not working against his need to reduce arousal when he looks away. I drew Tiffany Field's (1981) drawing of the relationship between heart rate and looking away. I suggested that Johann will gain more of a sense of control or agency if she can use his looking away as a signal to reduce her level of stimulation, and pause, waiting for him to return. Looking away will make him feel more comfortable, and he will be ready to resume.

Mrs. J. then mentioned that she still feels depressed, and she wondered about medication. We discussed what she could be so depressed about, because she was obviously pleased that things were going better with her baby, and with her husband as well. This led to a discussion of her relationship with her mother, who had preferred her older sister, who was a childhood prodigy as a pianist. Her mother had thought that she herself, as a child, was not interested in anything. Mrs. J. felt that her mother was in turn not very interested in her, and had not nurtured her emotionally or intellectually. She felt alone and "cheated of a childhood." Then, as she continued, Mrs. J. contradicted herself, saying that she had been nurtured emotionally, but not intellectually, by her mother. I pointed out the contradiction, and wondered about it. She smiled, calling it "revisionist history:" her mother *had* been emotionally nurturing, since her teen years.

I ventured that her sadness was such a continuing issue because she had unresolved mourning about how sad her childhood was. It was hard for her to mourn her childhood, because sometimes she admitted the sadness, and sometimes she denied it, in "revisionist history." I suggested that maybe her desperation to reach her own baby, going after the baby, had to do with feeling so unreached for, so alone, with her own mother. She was moved by this idea, and tearful. We talked about this a little more, and then we agreed to be in touch in about a month.

After the session was over, I mused over my sense that after the interactive misregulation has been identified, and the mother gets an acknowledgment of her concerns and some concrete "help," then there seems to be more mileage in the inquiry about the mother's history with her own mother. The interactive disturbance in this pair can be seen as the mother's unconscious attempt to right what went wrong in her relationship with her own mother, but an attempt which became an "overadjustment." Mrs. J's intrusion, "going after" Johann, not pausing, "calling," reaching right into his face, can be seen as her desperate need to contact him. She had to be sure that she and Johann were not again in the position that *she* had been in as a child with her own mother: she could not really "get" her mother's attention, nor feel as special as her sister.

#### ***Fourth Contact: Telephone. Johann Eight Months***

In a telephone conversation five weeks later, Mrs. J. reported that they were doing well. It often took Johann a while to warm up with other people. Mrs. J. was thrilled that he was more engaged: "He is more intimate; he touches my face, he is more sociable, he loves to look at me. He has great eye contact, it's amazing." She added, "Your suggestion to match his voice pattern really works: If he is getting upset, and I match him, it calms him down and then he'll look at me." I said I was delighted at how well things were going. When I asked about another filming, she said, "I don't *need* to come to see you, but I'm willing to come if you need it for your research." I said that I would really like to see her again.

I asked about the arching away. Mrs. J. said that Johann did it only if exhausted, or if someone wanted to hold him and he did not want to. Overall, Mrs. J. thought that the problem had been sleep deprivation. I did not comment on this; I did not want to challenge her. We agreed that she would come in for another lab filming follow-up, "for the research." A week later I received a note: "Dear Dr. B, Again, thank you for your help with Johann. He is such

a joy—to spend my days with him is very special.” A very central issue had shifted for Mrs. J. She was able to calm down enough to enable the baby to engage, and in this process she let this baby be special to her, the very thing her own mother could not give her.

***Fifth Contact: Lab. Johann Nine Months***

*Microanalysis of third mother–infant filming session, five minutes.* Johann remained in his stroller, because neither the infant seat nor the high chair seemed right. Mrs. J sat on the floor, at the infant’s eye level. Johann was looking down. Mother said, “What are you looking at?” Mother then waited, while Johann continued to look down, for eight seconds. As he spontaneously looked at her, Mrs. J’s face brightened into a partial smile. Johann looked down, Mrs. J’s face relaxed into an “interest” expression, and she waited.

At this point the research team interrupted, because the top of the stroller partially occluded Mrs. J’s face. I asked Mrs. J if she was comfortable on the floor, and if the distance seemed right. She said, “Yes, I try not to get in his face, you know.” As the session resumed, Johann was looking down, with a bit of masking tape in his hand. Mother said, “Is that a tape? Are you eating the tape? Is it delicious?” Johann briefly looked, and mother said, “Hi, is that good?” Johann looked down. Mother said, “You don’t want me to take the tape? Ok.”

Johann fussed, not looking, oriented away. Mother waited. Then he oriented and looked, hands held in a “pick-me-up” gesture, fussing. Mother matched his fuss rhythm, for about 10 seconds. Johann became more upset, actively wanted to get out of the stroller, and began pushing against the belt. Mother was calm and waited a few moments. Then she gently began to sing to Johann. He calmed down, moved his head down, not looking, and fingered the stroller strap. Mother said, “Yeah, play with your strap.” Mrs. J. then tried to entertain Johann by making sounds like a chicken. Johann averted 90 degrees. While oriented away, his body moved back and forth, and mother matched his rhythm with her own rapid breaths. Johann reoriented to mother, without looking, and began to play with the tape. Mother said, “Do you want me to take it?” Johann then fussed strongly. Mother said, “I *know*,” matching the fuss rhythm.

Mother hid her own face in “peek-a-boo,” and Johann looked at her, with a partial smile. Mother then made a movement in close toward Johann’s face, to hide his face in the peek-a-boo game, and he made a sudden, sharp movement of his head down, ducking mother’s approach. Mother said, “Ok”, and pulled back immediately. Johann then frantically arched 90 degrees, and mother stayed quiet and waited. Johann then hung over the edge of the stroller, limp. Then he fussed strongly. Mother said, “I’m *sorry*”, matching the rhythm of the fuss.

Now Johann looked at mother as she began to play patty-cake. Johann sustained a long gaze, his body moved excitedly, and he joined mother by moving his body in the rhythm of her patty-cake. Then Johann became fussy again, tried to get out of the stroller, and pushed against the strap. Mother vocally matched the infant’s distress sounds, and tolerated the distress without moving in, or requesting that he do anything different. I then stopped the filming.

*Commentary on third mother–infant filming.* As an infant approaches one year, the requirement of remaining in a chair is increasingly stressful. Thus, the face-to-face paradigm at this age becomes an assessment not only of the nature of the play, but increasingly of the dyad’s capacity to manage the infant’s frustration and distress. Mrs. J. patiently tolerated a great deal of distress, while Johann wanted desperately to get out of the stroller. Mrs. J. did not become anxious or pursue him. For the first time she could *wait*. Johann was able to reengage frequently, in between bouts of distress. Mrs. J did not disturb his self-soothing, and instead encouraged him to play with his strap or bit of tape. Mrs. J. was not intrusive into his face, with the

exception of the one moment when she covered his face with her hands for peek-a-boo. When Johann responded by dipping his head way down to avoid it, Mrs. J. immediately changed her strategy. Her apology was a poignant acknowledgment of the intrusion. Mrs. J. matched the rhythm and contour of Johann’s vocalizations and state of arousal, both positive and negative.

*Third stranger–infant filming: Commentary (without microanalysis).* With me, Johann could not tolerate to play alone. So we arranged Johann on mother’s lap, and I sat opposite. Mrs. J. had instructions to “Try to be the chair; try not to respond or help or encourage.” Johann engaged in vocal dialogue with me fairly well, staying visually engaged for long periods, despite considerable distress and wriggling. For a few moments he moved into face-to-face greeting and smiling with me, although it never reached a sustained high positive engagement.

We agreed that the filming went well. I admired how beautifully Mrs. J. was engaging Johann. She offered to come back for a 12-month follow-up, “for your research.”

### ***Sixth Contact, Lab Filming, Johann 18 Months***

It took six months to arrange this visit, after several cancellations. Johann was visually avoidant and fussy. We were not able to film a face-to-face play with mother or me before the Ainsworth test. In the Ainsworth test he cried very hard at both separations, but was comforted by mother in the reunions, molding his body into mother’s. Attachment classification: B (coded by a team-member blind to the infant’s status).

Mrs. J. was cordial and calm with the research team. Johann played well on his own. The mother–child play during the Ainsworth test was animated, with considerable use of emerging symbolic forms of play. Mrs. J. initiated a fair amount of the play, but was also able to follow his lead and elaborate on his focus of interest without intruding on his initiative. After the Ainsworth test, Johann engaged in positive play with another member of the research team.

### ***Discussion of the J. Case***

The three questions posed above are central in the initial evaluation: (1) in the procedural, action-sequence mode, how do mother and infant affect each other? (2) What can the mother verbalize about either of these directions of influence? (3) How do the mother’s representations and “transferences” to the infant interfere with her ability to perceive her own nonverbal behavior? In the verbal mode, Mrs. J. was aware that the infant was affecting her, since she was very distressed that the baby was “gaze avoidant, arching away, not interested in her, and not smiling as other babies do.” As the treatment proceeded, she was able to verbalize that Johann did not like her, and he made her feel that she was “not doing it right.” But Mrs. J. offered no comment on, and seemed to be unaware of, what she might be doing to influence the infant.

In the procedural mode, one of Johann’s contributions was a difficult constitution and temperament, with sleep and feeding difficulties, unusual sensitivities to sound, easily over-arousing. This self-regulation range would of necessity influence the interaction. Undoubtedly, the mother’s resolution of the sleep difficulties helped the pair to stabilize. However, this was not the whole story. By the time I saw them, the contribution of the infant’s temperament was inextricably intertwined with the interactive regulation.

Videotape microanalysis revealed further aspects of each partner’s influence on the other. The infant’s gaze and postural aversion influenced the mother to “chase,” pull, and go into the infant’s face. The mother’s body movements forward and into the face, while “calling,” influenced the infant to “dodge:” to look away, turn away, arch away, and to become “preoccupied” with extensive fingering as a mode of self comfort. Each continuously disturbed the other.

Overall, Johann was preoccupied with self-regulation, sacrificing engagement. Mrs. J. was preoccupied with obtaining engagement, while unsuccessful in regulating her own distress.

*Mother's "transference" to the infant.* My understanding was that Mrs. J. had an urgent need for Johann to repair her derailed contact with her own mother, who was much more interested in the extremely talented sister. She seemed to project into Johann that he did not like her or was not interested in her (as she felt her own mother had not liked her or been interested). Johann's withdrawal was too much like her own mother's rejection of her, evoking Mrs. J's injury with her own mother. What Johann urgently needed, that Mrs. J. pull back, lower her level of stimulation, and not chase, was counterintuitive to Mrs. J. because she desperately needed Johann's engagement to repair her lack of engagement with her own mother. She was further hampered by unresolved mourning and continued depression, because her adaptation had been to deny and partially dissociate how difficult her childhood had been. Mrs. J's urgent need to reach Johann prevented her from *perceiving* and noticing what she was *doing* that interfered with his ability to come to her. It interfered with her ability to read the infant's readiness for engagement, or state of overarousal that would need calming. Because she could not notice her own impact, she could not perceive half of the mutual influence equation.

The treatment resolution was to bring the mother from a very high level of activity into the midrange; and to bring the baby from a withdrawing adjustment more into the midrange of engagement. This was accomplished by admiring what the mother did well (see McDonough, 1993; Stern, 1995), as well as by helping her to calm down; to lower the volume, pause, and wait; to become behaviorally quiet at times; and to stop going into the baby's face. Some transference to me was also evident in the comment "everything you do is wrong," and her explanation that it was just a sleep disorder. My role was to "hold" or "contain" this aggression without interpreting it or retaliating. My interpretation in the feedback session that her unresolved mourning was being played out in her desperate need to reach her child was important in helping her pull back and calm down. Thus the treatment combined educational and interpretive methods, and reached Mrs. J. through both procedural and symbolic modes. In a follow-up session that Mrs. J. requested when Johann was 27 months, she reported that Johann was happy, loving, eating, and sleeping well. "He is a curious and well-adjusted two-year-old, with a real sense of himself. We understand each other, and I enjoy being with him."

## DISCUSSION

Infancy is potentially a period of remarkable plasticity, for both infant and mother. Clinical reports on early intervention show rapid and dramatic progress (see, e.g., Cramer et al., 1990; Fraiberg, 1980; Seligman, 1994) (but controlled clinical trials are rare). Although a few intervention approaches have used the fruits of microanalysis in conceptualizing interventions, three decades of microanalysis research remains underutilized in current mother–infant treatment approaches. Microanalysis of behavior operates at a level of detail and specificity that is richly useful to the mother–infant clinician, moving the treatment out of vague complaints (my baby does not like me) into exact behaviors, and how they are interactively as well as self-regulated. The advantage of watching the videotape with the mother, informed by interaction sequences revealed by microanalysis, is that the behavioral details then become the springboard for associations, reflections, memories, and insights into the meanings of these behaviors. Attempting to describe the videotape together, and asking the mother what she thought or felt when she or the baby behaved in a particular way at a particular moment, are critical ingredients in the process of translating the action sequences into declarative knowledge (see Stern, 1995; Kohler, personal communication, October 23, 1998).

Parents who consult me about their infants are usually motivated and available. They are presumably in sufficient discomfort that there is an inner pressure to resolve remaining difficulties of their own development, which may promote a rapid emergence of the transferences in accessible form. My respect for the parent’s struggle, and my gratitude in being trusted with this dilemma, also seem to facilitate a rapid therapeutic alliance (Hopkins, personal communication, April 8, 1998; Stern, 1995).

The video feedback method does not disturb the dyad while they interact. Later, when the parent and I view the videotape, it is simultaneously “immediate” and visually concrete, as well as somewhat “distant” and safer, in that it is not happening *right now* (Lefcourt, personal communication, July 7, 1998). In the video replay we can concentrate on a particular modality, and slow it down, whereas in the live interaction all modalities, as well as words, flood the senses. Because the visual information speaks on its own, the therapist is free to emphasize different aspects, to underscore the positive elements as well as identify derailments (Tabin, personal communication, September 10, 1998). Because the mother is usually so motivated to engage her infant, she can make an effort to overcome any natural awkwardness at seeing herself. We rarely know what we really look like as we interact. Seeing oneself on videotape may operate like a “shock” to the unconscious, “perturbing” the system (Milyentijevic, personal communication, June 26, 1998; Kohler, personal communication, October 23, 1998). This “shock” may be part of the emotional power of the video feedback method. The therapeutic viewing promotes a capacity to observe oneself in interaction, to think about the emotions seen in the video, and to reorganize representations.

The two hours set aside for the video feedback session allows a slow unfolding of the meaning of the interaction. Together, the mother and I “co-construct” what we can see, and what we can represent. At times, my “acting out” or exaggerating a particular face or gesture that we observe may evoke intense feeling, serving as an emotionally immediate route to the mother’s representations and “transferences,” in which she or her infant may be confused with figures of the past. When the mother notices a similarity to her own parent, or to herself as a child, or when she can identify some projection into the infant which makes her behavior now understandable, insight into the reasons for her behavior is created (Kohler, personal communication, October 23, 1998). This insight “frees” the infant from serving as a “container” for the mother’s projections based on previously unrecognized interactive memories (Moore, personal communication, August 24, 1999). Only one mother who has consulted me did not want to look at the videotape, and I simply used what I had gleaned from my microanalysis in the consultation.

The video microanalysis feedback method adds a depth and specificity of interactive organization that is ordinarily absent in a brief treatment, and would be difficult to achieve even in a lengthy individual treatment. There is no time to waste in a mother–infant disturbance, and this method goes directly to the core interactional dynamic. However, the success of the video method depends on the therapist’s sensitive capacity to “hold” the mother: to follow her lead and be her advocate; to sense the moment to suggest the video and how long to watch it; to maintain a collaborative rather than didactic stance; and to *stay with* the parent as the video is shown, alert to any signs of distress, particularly shame or feeling criticized, using these empathically to deepen our understanding of the parent’s experience of the infant, and of her own inner world.

When parents congratulate themselves at the end of the treatment for having known that “something was wrong,” as they often do, they are acknowledging the impact of the procedural mode, something felt but not usually recognizable without help (Tabin, personal communication, September 10, 1998). From the parents’s own development, procedural memories which were never symbolized eventually came to play a role in influencing behavior with the infant,

as well as representations of the infant. The psychoanalytically oriented video feedback method facilitates a description of maternal and infant behaviors which can be verbalized and reflected upon. Thus, previously dissociated procedural knowledge can be integrated and represented (see Fonagy & Target, 1996).

Disordered interactions remain exquisitely bidirectional and mutually regulated, with each partner contributing to the exchange. Although clearly the mother has the greater range and capacity, the mutual regulation model of interaction will help us to maintain the complexity of the interactive dance, and to remain empathic to how each partner is affected by the other.

**APPENDIX 1. Assessment “Check-List” of Mother–Infant Interaction Informed by Microanalysis**

	<i>Optimal Patterns</i>	<i>Nonoptimal Patterns</i>
<b>I. Gaze</b>		
A. Mother		
Maternal management of infant’s look/look away cycle organizes level of stimulation by infant look/look away:		
a. Decreases stimulation when infant looks away	Decreases	Increases
b. Greets when infant looks back	Yes	No
c. Increases stimulation only during infant look	Yes	No
d. Does not “call” infant when infant looks away	Does not	Does
e. Does not pull infant’s arm while infant looking away	Does not	Does
f. Does not “chase” by moving in direction infant moved	Does not	Does
g. Does not attempt to force infant’s head into vis-à-vis	Does not	Does
h. Awareness of infant look away	Aware	Oblivious
Maternal management of infant attention to object		
a. Follows infant’s line of regard	Yes	No
B. Infant		
a. Look/look away cycle	Yes	No: Vigilant gaze/avoidant gaze
b. Capable of sustained gazes	Yes	No: Rapid glances/sideways gaze/scanning
c. Infant must self-soothe to sustain gaze	No	Yes
d. Angle of visual “cut off” remains within 60 degrees of vis-à-vis	Yes	No: 90 degree aversion/arch/collapse tonus
<b>II. Face</b>		
A. Mother		
a. “Tracks” infant’s facial changes	Yes	No: Flat, neutral/frozen positive
b. Face animated in range from low to high positive	Yes	No
c. Face negative: frown, grimace, compressed lips, sadness, anger	No	Yes
B. Infant		
a. “Tracks” mother’s facial changes	Yes	No: Too “steady state”
b. Capable of “joy” (wide-open “gape” smiles)	Yes	No
c. Positive expressions sustained	Yes	No: Fleeting
d. Uses range from positive to negative	Yes	No: Constricted, neutral/ extensive negative [frown, grimace, tight mouth, surprise]
<b>III. Vocalization</b>		
A. Mother		
a. Presence of vocal prattle	Yes	No
b. Presence of pausing (vs. continuous vocalizing)	Pausing	No pausing
c. Prattle is positive vs. negative (prohibition, critical, demanding, attributes rejection)	Positive	Negative

APPENDIX 1. *Continued*

	<i>Optimal Patterns</i>	<i>Nonoptimal Patterns</i>
d. Vocal contours are sinusoidal or flat	Sinusoidal	Flat
e. Rhythm is slow	Yes	No (fast)
f. “Matches” infant’s vocal rhythm and contours	Yes	No
g. Vocal demand while infant looks away	No	Yes
<b>B. Infant</b>		
a. Presence of vocalizing	Yes	No: (very quiet)
b. “Matches” mother’s vocal rhythms	Yes	No
c. Vocalization primarily positive/neutral	Yes	No: Fussy/Angry protest/Cry
d. Inhibition of all vocal distress	No	Yes
<b>IV. Infant distress and self-comfort</b>		
<b>A. Maternal management of infant distress</b>		
a. Woe face/woe vocalization to infant distress	Yes	No
b. “Matches” infant distress rhythm, gradually slows it down	Yes	No
c. Does not escalate infant distress	Does not	Does
d. Verbal empathy to distress	Yes	No
e. Does not show positive face to infant distress	Does not	Does
f. Does not mock infant distress	Does not	Does
g. Does not verbally deny infant distress (laugh, giggle, “this is sort of fun,” as infant cries)	Does not	Does
<b>B. Maternal management of infant self-comfort</b>		
a. Does not disturb infant hand to mouth, fingering clothes/ mother	Does not	Does
b. Does not extensively put own finger into infant’s mouth	Does not	Does
c. Does not do oral teasing	Does not	Does
<b>C. Infant distress and self-comfort</b>		
a. Vocal distress: see Infant Vocalization above		
b. Facial distress: see Infant Face above		
c. Capacity for self-comfort (self-touch, fingering clothes or mother)	Present	Absent
d. Does not engage continuously in self-comfort	Does not	Does
e. Does not show autonomic distress (hiccup, vomit) or disorganized scanning	Does not	Does
<b>V. Maternal touch</b>		
a. Games of feet/hands	Yes: Some	Yes: Constant/no: None
b. Does not go into infant’s face	Does not	Does: Loom, pinch cheeks, snap fingers
c. Does not tickle	Does not	Does
d. Does not handle roughly	Does not	Does
e. Caretaking	Mild	Continuous picking
<b>VI. Infant capacity for engagement with stranger</b>		
a. Capable of sustained gazes, with look/look away cycle	Yes	No: Gaze avoidant/obligatory attention
b. Full positive-negative facial range	Yes	No: Neutral/negative
c. Vocalizes primarily positive/neutral	Yes	No: Fussy/little vocalizing
d. Moderate self-comfort	Yes	No: Constant/none
e. Moderate level of arousal	Yes	No: Overaroused, agitated/limp
Overall: if the interaction with mother has been very stressful, can the infant repair with stranger?	Yes	No
Does the stranger feel that she has to be very “careful” with the infant	No	Yes



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