

# MY JOURNEY IN INFANT RESEARCH AND PSYCHOANALYSIS: *Microanalysis, a Social Microscope*

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In this paper I describe my personal journey in infant research and psychoanalysis. I describe my work with Daniel Stern and Joseph Jaffe in infant research, and with Frank Lachmann in psychoanalysis. I note some of the people and ideas that influenced me along the way. Video microanalysis taught me to see how the intricate process of mother-infant moment-to-moment communication works. It is a powerful research, treatment, and training tool.

Video microanalysis taught me to see how the intricate process of mother-infant moment-to-moment communication works. It is a powerful research, treatment, and training tool. I owe my love of video microanalysis to Dan Stern.

Video or film microanalysis operates like a social microscope into the underworld just below perceptible view in real time. Mother-infant communicative events occur in less than a second (Beebe, 1982). They are so rapid and subtle that they are not quite grasped in real time. By slowing down the movements, frame-by-frame microanalysis identifies remarkably beautiful moments, such as both partners rising up and up into glorious sunbursts of smiles. It also reveals very disturbing moments, such as maternal anger or disgust faces, or infants becoming frantically distressed or frozen in alarm. By videotaping mothers and infants split-screen, one camera on each partner, we can see the moment-by-moment dialogue between the two.

From birth, infants live in a two-person social world, and they are capable of coordinating their behaviors with those of the partner (Peery, 1980; Trevarthen, 1979).

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Each partner coordinates with the other, a bidirectional mutual regulation. Later I will describe how bidirectional regulation became a key contribution of infant research to a psychoanalytic theory of development and treatment.

This rapid face-to-face communication system that we study between mothers and infants also operates between adults. Because verbal language is not available for infants we must try to understand their nonverbal language. Adult face-to-face communication is very similar to mother-infant communication. The nonverbal aspects of behavior, such as gaze shifts, slight changes in facial expression or head orientation, eyebrow raises, are almost imperceptible, but are extremely influential in communicating. This rapid, quasi-automatic social processing is largely nonconscious, out of awareness. It is an implicit, procedural, action-sequence form of processing. It is probably based on evolutionary adaptation to the need for rapid interpersonal processing and action in the service of survival. Frank Lachmann and I became fascinated with parallels between mother-infant communication and nonverbal communication in adult treatment. This fascination has fueled our collaboration for three decades.

### The State of Infant Research as I Entered Graduate School in 1968

When I entered graduate school in 1968, at Teachers College, Columbia University, the empirical microanalysis of mother-infant face-to-face communication did not yet exist as a field. It was just beginning. Daniel Stern published his first paper in 1971; Colwyn Trevarthen in 1972; T. Berry Brazelton, Barbara Kozlowski, and Mary Main in 1974. Edward Tronick, Brazelton's student, soon became a leading figure in the late 1970s. Lynne Murray, Trevarthen's student, and Jeffrey Cohn, Ed Tronick's student, as well as Alan Fogel, Tiffany Field, and Michael Lewis, among others, were active at that time. These researchers began with low-risk community samples in order to understand the course of normal development. Two decades later, risk factors, such as maternal depression, began to be included (Field, 1995).

The decade of the 1960s had generated a body of work that Stone, Smith and Murphy (1973) summarized as "the competent infant." This set the stage for the study of mother-infant communication, including the role of a competent, initiating, social infant. In 1968 Bell published a paper that helped shift the paradigm of child development research toward an interactive systems view. He argued that most of the research to date had emphasized parental influence upon children, a one-way influence model, to the relative exclusion of the child's influence on the parent. Bell reinterpreted this research within a bidirectional model.

With increasing recognition of the infant's social competence, researchers became interested in a bidirectional, or mutual model of influence, within the dyad as a system. An important book entitled "The effect of the infant on the caregiver" was written by Lewis and Rosenblum (1974) in an effort to highlight the neglected role of the infant in mutual regulation. However, in the 1970s and 1980s, infant researchers argued vehemently over whether the bidirectional, mutual regulation model was correct. This was the intellectual Zeitgeist that I entered as I began graduate school in 1968 and became interested in infant research.

Not until two decades later was this debate resolved, with Cohn and Tronick's (1988) landmark paper that used time-series analysis to show that mother-infant interaction is indeed bidirectional. Until this time, everyone had used a different statistical method to try to assess bidirectional influence, and no one replicated their own work, or anyone else's.

The approach of time-series mathematics revolutionized the study of social interaction in the 1980s and was critical in resolving this debate. It assesses moment-to-moment adjustments (interactive predictability) that each individual makes to the partner's prior behavior, while it controls for each partner's self-predictability. Metaphorically it measures expectancies of "how I affect you," and "how you affect me." This became our method as well. Cohn and Tronick's (1988) resolution of this debate by documenting bidirectional mutual influence between mother and infant laid the empirical foundation for an interactive systems model of infant social development.

### Graduate School at Teachers College

At Teachers College in 1968 I pursued a joint doctorate in developmental and clinical psychology. In my first year George Rand, in developmental psychology, taught me about different theories of development, and especially about Heinz Werner and Jean Piaget. George had studied with Heinz Werner. Both Werner and Piaget held an interactive model of development in which both organism and environment affect one another. This fit so well with the bidirectional model from infant research.

George was the first to encourage me to follow my interest in infants. I remember that I entered graduate school with the idea that I wanted to study "mother-infant reciprocity" and infant emotional development. But initially I did not meet with a lot of encouragement to study infants. Even in a department of developmental psychology, infants were seen as rather undifferentiated. I was advised to study *children* whose emotional development would be really interesting.

Once I met Dan Stern, everything was different. There was no question that the study of mother-infant communication was hugely exciting and fascinating. I met Dan Stern at New York State Psychiatric Institute (NYSPI), Columbia University Medical School, in 1969, in my second year of graduate school. I was asking everyone for a lead to an infant researcher. I heard about him on Fire Island, where he often went for summer vacation. I remember the day I met Dan. I arrived at the open door of his office, while he was on the telephone. As he carried on his verbal conversation on the telephone, he also carried on another nonverbal conversation with me, through his face and eyes, which were welcoming and interested. Already we were into nonverbal communication.

I worked for Dan Stern as a volunteer research assistant at NYSPI from 1969–1973. I later learned that Dan had been a postdoctoral fellow of Joe Jaffe at NYSPI, and they were working together at this time. I had no idea then that eventually I would spend four decades working closely with Joe Jaffe.

Dan, accompanied by several graduate students, was videotaping twins in their homes with one camera. Dan encouraged the students to play with the infants on camera as well. I played with infants, which set the stage for the study of "stranger-infant" interaction. At that time we had no idea that stranger-infant interaction would turn out to be a powerful predictor of development.

Being the stranger playing with the infants, in those home visits with Dan Stern, shaped my interest in infant research. One of these visits was particularly memorable. I played with an infant whose face was full of joy. As I watched her face respond to mine, tears came to my eyes. I was so astonished and moved by how closely she tracked my face, how exquisitely she seemed to respond to me, how her face burst into what I later came to call the "gape smile," the hugely open-mouth smile, the apex of positive affect. That particular experience led me to do my dissertation with Stern. I wanted to study what I had observed in that infant, the process

of positive affect, how it surges, ebbs, and crescendos. My dissertation was entitled, "Ontogeny of positive affect in the third and fourth months of life of one infant" (Beebe, 1973). The four frames below are taken from my dissertation and illustrate the process of positive affect crescendo. The fourth frame is the gape smile (Figure 1).

Dan was very playful. We, the other graduate students and I, loved going on these outings with Dan. In the lab he always wanted to go get a cup of coffee and tell about his newest ideas. He had tremendous energy and enthusiasm and brilliance. Everything seemed possible with Dan.

Dan sponsored my Ph.D. dissertation, along with Herbert Birch and Rosalie Schonbar at Teachers College. Herbert Birch was a brilliant developmental researcher. He backed my interest in doing a case study, a microanalysis of one mother-infant pair. Then, and even now, an empirical dissertation on a single case is rare. Sadly, Birch died just as I began the initial phases of analyzing my data. I wish he could have seen the work that he had so encouraged.

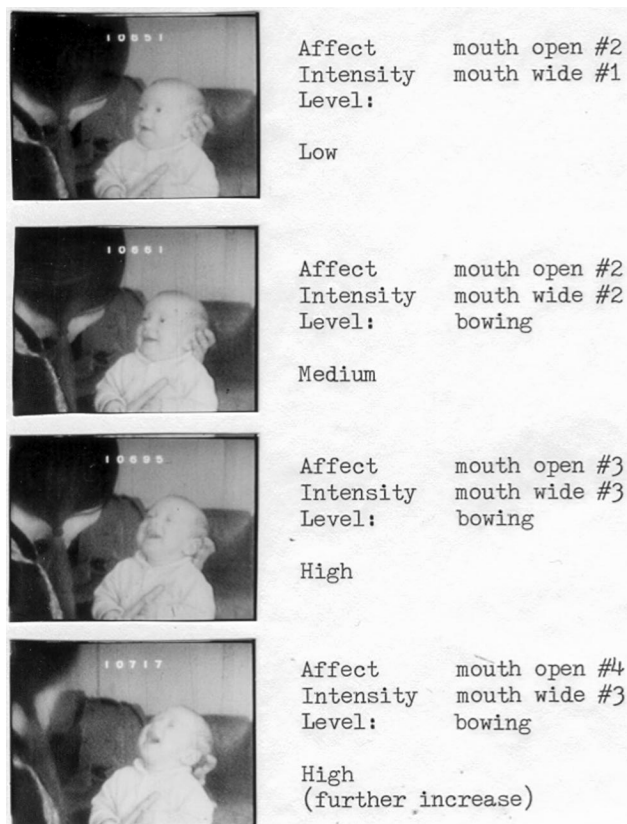


Figure 1. Sequence of infant positive affect. Note: 16mm film, 24 frames per second. Numbers printed at the top of the frame indicate 24ths of a second: 10651, 10661, 10695, 10717. Frames 1 to 2 are about 1/2 second apart; frames 2 to 3 about 1.5 second apart, and frames 3 to 4 about 1 second apart. Affect intensity levels are coded by degree of mouth open (1 to 4), degree of mouth widen (1 to 3), and presence or absence of bowing at the mouth corners, which indicates zygomaticus retraction, producing a smile. Note that the infant's head moving up is salient in the final frame.

## Microanalysis in 1969

In 1969, the use of video cameras was relatively new and computers were still uncommon. Video was reel-to-reel and difficult to code. To perform a microanalysis we converted video to 16 mm film, which had 24 frames per second. We used an editing viewer, a small metal box anchored to a board, through which one could view the film. The board had metal posts on either side of the box, onto which two film reels were securely attached. The film fit through the metal box, and a light projected the film onto the wall. But to see the film one had to be in a darkroom. The setup was just like one for editing a film, except instead of cutting the film, we were analyzing it. Numbers were printed on the top of each film frame. With one's own hands, one could slowly move the film forward and back to watch movement unfold in time. We identified the beginning and ending frame of each little movement of mother and infant. These movements, such as slight shifts of gaze, head-up, or mouth-opening, typically last about a quarter to a third of a second (Beebe, 1982).

Today digitized video makes this whole process so much easier. But the hand method of frame-by-frame analysis of film had one interesting advantage. My own body movement was involved in detecting the onset and offset of each behavior. For example, in the chase and dodge interaction (described below), as I rocked the film back and forth between the two reels, my body moved with the mother's movement as she loomed in close to the infant's face, and my body moved with the infant's head movement back and away from the mother, a split-second later. I believe my own visceral feedback helped me better comprehend how these movements might be experienced by the infant, and by the mother. This is a form of embodied simulation. Performing the action of another person influences one's perception of the person's action and facilitates recognition of it (Oberman, Winkielman, & Ramachandran, 2007; Niedenthal, Mermillod, Maringer, & Hess, 2010; Beebe & Lachmann, 2013). In my case, I was participating in the action through my body movements as I coded.

### Stern's First Paper

Dan Stern's first paper was in progress as I joined his research team. It was a film microanalysis showing the difference in interactive regulation between a mother and her dizygotic twins (Stern, 1971). Stern's approach to microanalysis was influenced by ethology, which privileges the careful description of behavior in its natural habitat, detailing the form, sequence, and timing of behavior. Careful description is a prerequisite to understanding the social communication value of behavior. This ethological approach continues to influence the microanalysis of mother-infant communication.

When Dan had finished the coding of the mother and infant gaze and head orientation behaviors for his paper, we pasted the data all over the walls of Dan's office. We were so excited. In this very first paper, Dan positioned the interaction and its bidirectional regulation as central to the understanding of a relationship. He was interested in how each partner affected the other. Dan showed fascinating ways in which this mother interacted so differently with her two twins, and each twin, Fred and Mark, interacted differently with her. Mother and Fred had an approach-avoid spatial pattern, with split-second bidirectional contingencies. Mother and Mark had an approach-approach pattern, also with split-second coordination.

Dan presented his findings in the infant research meetings, the International Conference of Infant Studies (ICIS). We all felt on the crest of something so new, so important.



I met Ed Tronick at the ICIS meeting in the spring of 1974. He has remained an important friend and colleague for four decades.

Stern (1974) framed the study of mother-infant interaction in the larger context of its importance for interpersonal object relations and attachment, still a central research issue today: “By providing a more fine-grained view of the instant-by-instant interactive events which make up the mother-infant relationship, we may be in a better position to modify and expand current working theories on the nature of developing object relations or attachments” (Stern, 1974, p. 402). Stern (1985) later developed these ideas in his groundbreaking work, *The Interpersonal World of the Infant*, which had a transforming effect on psychoanalysis.

### My Clinical Training

Meanwhile I also pursued the clinical side of my training. In 1971–1972 I did my clinical internship at Yale at the Connecticut Mental Health Center. There I met Sid Blatt. We shared an interest in the developmental theories of Heinz Werner and Jean Piaget. Sid was very supportive of my interest in infant research, and he continued to critique my papers for several decades. Blatt’s 1974 paper was very influential at that time. But already he and I were debating the theory of infant development. The dominant theoretical Zeitgeist of Margaret Mahler, and symbiosis and separation-individuation, was being challenged by the emerging empirical research findings.

Psychoanalytic theories of development had underestimated the social capacities of infants. A decade later I summarized the empirical research from the late 1960s to early 1970s this way: “To appreciate the significance of microinteraction, we must expand the psychoanalytic view of early interaction, which focuses on feeding and the management of tension states, to include social interaction and play. . . . From birth the infant is innately structured for active and stimulus-seeking behavior. . . . Neonates show rooting, sucking, molding, and orienting behavior; the ability to scan visually, focus on, and track a moving object; the capacity to respond to visual stimuli by widened and brightened eyes, changes in respiration, a decrease in random movements, and fine nuances of facial expression. . . . Neonates not only seek and initiate social interaction. . . but can also modulate or regulate social stimulation in the face of aversive conditions with self-quieting measures, inhibiting their responsiveness or habituating to a disturbing stimulus. . . . These innately organized patterns of behavior equip the infant to engage in primary relatedness with the human partner” (Beebe, 1986, p.29). The research I cited then included Stechler and Carpenter (1967); Ainsworth (1969); Kessen, Haith, and Salpatek (1970); Brazelton, Kozlowski, and Main (1974); Stern (1974); Fantz, Fagan, and Miranda (1975); Lewis and Brooks (1975); Als (1977) and Oster (1978). This research portrayed a very different infant from the infant of the autistic phase in Mahler’s theory, which Stern critiqued. From different points of view, Winnicott (1965); Bowlby (1969); and Spitz (1965) were also working with a view of the infant as capable of a primary social relatedness from birth.

The research on early social capacities set the stage for the burgeoning interest in mother-infant face-to-face communication in the 1970s and 1980s. We sought to understand how these infant capacities were used in the face-to-face exchange by 3 to 4 months, when infants’ social capacities flower.

When I returned from Yale to do my final year at Teachers College, in September, 1972, I was assigned Frank Lachmann as a supervisor. This was one of the luckiest turns

of my life. Frank and I have continued to meet once a week since that time, now over 40 years.

Frank and I spent the first decade of our relationship in supervision on the Burton case (1972–1982). We then wrote up the case (Lachmann & Beebe, 1983). At that time, the main psychoanalytic theorists were Margaret Mahler and Edith Jacobson. Heinz Kohut had just published his first book in 1971. But Frank in 1972 was already very familiar with Kohut.

In 1983 we took a year off from our supervision relationship, and I taught him my course on infant social development, which I was teaching at the Ferkauf Graduate School, Yeshiva University, where I taught from 1976 to 1992. By then I was already studying in the New York University Postdoctoral Program in Psychotherapy and Psychoanalysis (1980–1986). We took notes that year as I reviewed the infant research with Frank, and we wrote a long, unwieldy paper. After we threw that paper out, we were ready to write. Frank and I wrote more than two dozen papers that included the relevance of infant research for adult treatment.

We published our first papers in 1988, one in *Psychoanalytic Psychology*, and one in *Progress in Self Psychology* (Beebe & Lachmann, 1988a and 1988b, respectively). At that time, another leading psychoanalytic journal turned our work down.

In “The contribution of mother-infant mutual influence to the origins of self and object representations” (Beebe & Lachmann, 1988a), we proposed that early social experience is organized in an interactive framework. We summarized the research on early infant capacities, such as feature detection, visual recognition, memory, and the perception of cross-modal correspondences that defined our concept of presymbolic representation. We illustrated patterns of matching and of derailed exchanges in 4-month mother-infant mutual regulation. Matching patterns included matching of affective direction and matching the temporal patterns of vocal and kinesic (movement) exchanges. Derailed patterns were illustrated with “chase and dodge” interactions, described below. We suggested that presymbolic self and object representations are based on a dynamic process of reciprocal, bidirectional adjustments: “What is represented is an emergent dyadic phenomenon, structures of the interaction, which cannot be described on the basis of either partner alone” (Beebe & Lachmann, 1988a, p. 305).

This view stands in contrast to the prevailing view at that time of separate, static, self- and object representations. Psychoanalysis began with a one-person view of psychic organization. As Blatt (1986, p.1–2) noted, “Even as late as 1960, many psychoanalysts still viewed the individual essentially as a closed system. . . . Beginning around 1960, major movements both in England and the United States began to consider psychological development as occurring in an open system in which there was an interaction between the unfolding biological predispositions of the child and the patterns of care provided by caring agents.”

Frank and I (Beebe & Lachmann, 1988a) argued that a two-person field organizes infant experience from the beginning. Our view is very different from some current prevailing views that the mother’s response to the infant organizes the infant’s experience. Instead, both infant and mother cocreate the nature of the infant’s experience, although the mother has the greater range, flexibility, and capacity. Moreover, we have always been careful to conceptualize the individual’s own contribution to the dyadic cocreation. We think of dyadic bidirectional regulation as existing in dynamic relation to the self-regulation of each partner of the dyad (Beebe, Jaffe, & Lachmann, 1993; Beebe & Lachmann, 1994, 2002).

The papers that Frank and I wrote between 1988 and 2000 were reworked into our first book, *Infant Research and Adult Treatment: Coconstructing Interactions* (Beebe & Lachmann, 2002). In that book we also revisited the Burton case, reformulating the treatment based on what we had learned together from infant research.

Through our collaboration we contributed to the creation of a home within psychoanalysis for the relevance of the ideas that emerged from empirical infant research. This was possible in large part because of the enormous support that we received from the psychoanalytic communities that encouraged our work: the New York University Postdoctoral Program in Psychotherapy and Psychoanalysis; the Institute for the Psychoanalytic Study of Subjectivity; the Columbia Psychoanalytic Center; the Postgraduate Center; the International Association of Psychoanalytic Self Psychology; the Los Angeles Institute for Contemporary Psychoanalysis; and the Washington, DC Institute for Contemporary Psychoanalysis, among others.

Largely because of my relationship with Frank, I have continued to try to integrate my infant research work with my love of psychoanalysis. Frank became my anchor in psychoanalysis as I struggled with the challenge of integrating these two fields. Frank and I have just published our second book, *The Origins of Attachment: Infant Research and Adult Treatment* (Beebe & Lachmann, 2013).

Later in my life I came to realize that I needed both the fields of infant research and of psychoanalysis in an effort to integrate my parents' very different intellectual interests and personalities. My father was a researcher, a radiation epidemiologist, who designed the follow-up studies of Hiroshima, Nagasaki, and Chernobyl. My mother was a school psychologist, and she went to Teachers College, in the same program I attended some four decades later. She was the psychologist for Beauvoir, the preschool associated with the National Cathedral Schools in Washington, DC. Later for several decades she was a school psychologist in Rockville, Maryland, responsible for 30 schools.

### “Chase and Dodge”: Postdoctoral Fellowship With Stern, 1973–1975

I continued to work with Dan Stern in a postdoctoral fellowship at NYSPI. From 1973–1975, I analyzed the “chase and dodge” film, a total of 8 min. Steve Bennett, who was a member of Dan’s team, sat with me for many hours viewing the film frame-by-frame. In this film we identified repeating sequences in which the mother’s “chase” movements (moving her head and body in the direction that the infant just moved) were followed by infant “dodge” movements (moving his head back and away). In the moments when the infant turned to look at her, the mother typically made a “mock surprise” expression and loomed into his face, which set off the infant’s dodge behaviors. But the opposite sequence was significant as well: infant dodge movements were followed by maternal chase movements. This was an early example of bidirectional influence, the idea that each partner’s behavior affects that of the other. It is not only the mother who “drives” the interaction. Moreover each responded to the other with split-second timing, within approximately 1/3 s from the onset of the partner’s prior behavior. The infant had a virtuoso repertoire of withdrawal and avoidance maneuvers. To every maternal overture, the infant could move his body back, duck his head down, turn his head away, or pull his hand out of mother’s grasp, exercising a virtual veto power over the mother’s efforts to engage him in a face-to-face encounter. This pattern illustrates the infant’s role in the interaction. Moreover, rather than tuning out, the infant remained exquisitely sensitive to



the mother's every movement, an acute vigilance. At the time I thought of this study as illustrating a new concept of infant coping and "defense."

I presented the chase and dodge findings at Downstate Medical School in 1975 in a conference run by Norbert Freedman. A decade later Freedman was my supervisor during psychoanalytic training. I also met Fred Pine at that conference. He and I continued to discuss the ideas, and he continued to critique my papers over the next several decades. In the early years when it was a struggle to get our ideas accepted and published, Fred Pine's recognition of my work was very important to me.

In the paper I presented at Downstate, "Engagement-disengagement and early object experiences" (Beebe & Stern, 1977), instead of the idea that mothers and infants are in a symbiotic union, and then the infant differentiates, Stern and I proposed the idea of a continuum of engagement and disengagement experiences being coconstructed simultaneously. The infant is continually getting experience with forms of "being with," such as direct mutual gaze, with gradations of positive affect, building up to the apex of positive affect, the gape smile. But the infant is also getting experience with forms and degrees of disengagement, looking away, degrees of orienting the head and body away - from slight angles away from vis-à-vis to increasing angles away, to 90° aversion, arching, or turning all the way around to the environment.

At that time we did not know if this chase and dodge pattern might be predictive in development, although we suspected that it would be. Most of our work was case studies. We despaired of ever getting sufficient numbers of dyads with microanalysis data to test the predictive significance of chase and dodge. But, with armies of students, in 2010 my team published a research monograph on the origins of attachment, based on a microanalysis of mother-infant interaction in 132 dyads at 4 months (Beebe et al., 2010). In this work we documented that the chase and dodge pattern at 4 months indeed predicts a form of insecure attachment at 12 months, resistant attachment.

### Joe Jaffe

Shortly after my postdoctoral fellowship, Dan Stern moved from Columbia to Cornell. I stayed at NYSPI to work with Joe Jaffe. Joe did many of the mathematical analyses for Dan's early papers. I worked closely with Joe, running a mother-infant filming lab, for about 4 decades (1975–2012). During part of this time I held a full-time teaching job at Ferkauf Graduate School, Yeshiva University (1976–1992). I also had a small independent practice, which is ongoing.

Joe Jaffe died in August 2012, and Dan Stern died in November 2012. So I have lost my two main infant research mentors/colleagues/friends.

Dan Stern was an idea person, a tremendously creative thinker and theoretician. Joe Jaffe was also a very creative theoretician, but he was devoted to an empirical exploration of the theories. In his hands, the data led the theories. Joe's love of empirical research was an excellent fit with my own interests. Although I never did the mathematics myself, I always understood and appreciated it, probably because of my father's background in mathematics and biostatistics.

Joe Jaffe's far-ranging research interests included theoretical biology, biomathematics, speech rhythms, and automated methods of analyzing speech rhythms, the biological foundations of language, cerebral laterality, infant development, and psychoanalysis. He studied neurology with Morris Bender. He was a graduate of the William Alanson White Institute for Psychoanalysis, where he was supervised by Clara Thompson and was a

classmate of Emmanuel Ghent. At the White Institute, Jaffe became interested in timing disruptions in psychotherapy. He came to NYSPI in 1961.

Joe considered timing and rhythm to be basic organizing principles of all communication. This idea influenced Stern's work and my own. Joe felt that the words were not enough; he wanted the music. I came to see that the timing of behavior, regardless of its content or modality, constitutes a continuous message system about the state of relatedness between two partners (Beebe et al., 2000; Jaffe, Beebe, Feldstein, Crown, & Jasnow, 2001). Temporal patterns refer, for example, to rhythm, pausing, simultaneity, and turn taking. All temporal information is embedded in the rich visual, auditory, kinesthetic, multimodal display of communication. Coordinating temporal patterns between partners, such as matching rhythms, or predictably responding within a rapid timeframe, is one critical way in which social relatedness is organized. Moreover timing is usually out of awareness and conscious control. But subtle changes in timing, such as a long hesitation, alter the experience of relatedness.

For example, Joe's interest in timing influenced a paper by Beebe, Stern, and Jaffe (1979). Using 16 mm film (24 frames per second) to examine mother-infant movements of head, gaze, and face during face-to-face communication at 4 months, we identified coactive and alternating timing organizations in the movement patterns, similar to coactive and alternating timing organizations Stern had identified in vocal patterns (Stern, Jaffe, Beebe, & Bennett, 1975). When movements are coactive, there is an overlap between actions, during which mother and infant are moving quasi-simultaneously. During coaction, the mean duration of the onset from either individual's movement to that of the partner is about 1/4 s. These rapid onset times are too fast for a stimulus-response explanation. We interpreted them as indicating that mother and infant were in a predictive system with each other, based on expectancies of prior events.

When mother and infant alternated movements, we discovered a fascinating rhythm. Alternating movements contain no overlap between the actions of the two partners. Instead each partner has a two-part cycle of a movement, followed by a movement "hold." The average onset times for mother and infant movement were identical, approximately 1/2 s. Repetition of such a cycle of an event plus a hold defines a rhythm, and the mean duration of this rhythmic cycle was matched by mother and infant. This finding paralleled Jaffe and Feldstein's (1970) similar finding in adult speech, a rhythmic matching of vocalization-pause cycles. This rhythmic matching suggested that alternating sequences were also based on expectancies.

The concept that mother and infant were in a predictive system with each other, based on expectancies, later received a great deal of support both from experimental studies (Haith, Hazan, & Goodman, 1988) and studies of social interaction (Tronick, 1989). The concept of expectancies became key to Stern's (1985) later work on interpersonal world and the origin of the self, as well as to Beebe and Lachmann's (2002) work on the presymbolic origins of self and object representations.

Joe Jaffe and Stanley Feldstein published their pivotal work, *Rhythms of Dialogue*, in 1970 (still in print today). Stanley Feldstein was a key collaborator of Jaffe and later of mine. Examining the coordination of speech rhythms in face-to-face conversation between adults, this research documents that silences (pauses) provide important information. The way partners exchange speaking turns, specifically the degree to which they match the durations of the pauses at the point of the turn switch, is correlated with empathy, interpersonal attraction, field independence/dependence, and partner novelty. Moreover, interruptive speech, without

pauses at the moment of the turn switch, leads to the breakdown of effective dialogue. This book informed all our work on mother-infant communication.

### Rhythms of Dialogue in Infancy and the Optimal Midrange Model

In the early 1980s Jaffe and I, collaborating with Stanley Feldstein, Cynthia Crown, and Michael Jasnow, set out to apply the adult rhythms of dialogue model to mothers and infants. We spent several years, meeting on weekends, writing a grant that finally succeeded in getting funded. We collected a cohort of mothers and infants from 1985 to 1990, which culminated in a research monograph, *Rhythms of Dialogue in Infancy* (Jaffe, Beebe, Feldstein, Crown, & Jasnow, 2001). We documented that the degree to which the mothers and infants, and strangers and infants, coordinated vocal turn taking (matched durations of switching pauses at the point of the turn exchange) predicted 12-month infant attachment and infant cognition. Thus in infancy as well as adulthood, the way partners exchange turns provides a potent assessment of the emotional quality of the relationship. This work defined a fundamental dyadic timing matrix that guides infant development.

However, it was not high coordination in infancy that was optimal for infant attachment at 1 year. Instead, midrange degree of coordination of vocal turn taking was optimal. We dubbed this finding “the optimal midrange model.” It stands in contrast to most theories, which argue that more coordination, more attunement, and more synchrony are optimal in development. Our finding is consistent with Winnicott’s (1965) concept of “good enough” mothering. High coordination is seen as excessive monitoring, or “vigilance,” a dyadic effort to create more moment-to-moment predictability. It can be seen as a coping strategy elicited by novelty, interactive challenge, or threat. Low coordination is seen as inhibition of monitoring, or withdrawal. Midrange coordination leaves more “space,” more room for uncertainty, initiative, and flexibility within the experience of correspondence and contingency—optimal for secure attachment (Beebe et al., 2000; Jaffe et al., 2001). Mary Sue Moore made a major contribution to our understanding of the vocal rhythm data in relation to attachment.

We are now following up into young adulthood these dyads that we filmed from 1985 to 1990 (Beebe et al., 2013). In the last half-decade, Hope Igleheart, and Miriam and Howard Steele have become key collaborators. Although this study is still in the early stages, we have found 32 dyads, and the offspring are in their early 20s. Again we are finding that the ways that mothers and infants, and particularly strangers and infants, coordinate vocal turn taking (switching pauses) in infancy predicts aspects of the adult attachment interview at young adulthood.

### The Role of the Stranger

Beginning with the home visits in 1969 when I accompanied Stern and played with the infants, I became interested in the role of the stranger. In a case study with Lou Gerstman (Beebe & Gerstman, 1984), we showed similar coordination in mother-infant and stranger-infant interactions. We suggested that the infant’s ability to coordinate with a stranger is a more general social perceptual capacity available for use with any adult partner at this age. Another study of three infants documented significant mutual influence to match durations of behaviors in both stranger-infant and mother-infant interactions, using time-series analysis (Beebe, Jaffe, Feldstein, Mays, & Alson, 1985).

A powerful role of the stranger later emerged in *Rhythms of Dialogue in Infancy* (Jaffe et al., 2001). Vocal coordination between infant and stranger predicted attachment at 1 year just as well as that between infant and mother. Moreover, stranger-infant interactions identified a wider range of attachment outcomes than did mother-infant interactions. This finding suggests that the 4-month infant has the flexibility to respond differently to the stranger than to the mother.

Stranger-infant interaction continued to predict the development of these infants better than mother-interaction. Sara Markese, originally a lab assistant who later received her Ph.D. from CUNY, wrote her dissertation using vocal coordination in infancy to predict attachment as these infants turned 4 years old. Primarily the patterns of stranger-infant vocal turn taking, rather than those of mother-infant, predicted 4-year attachment representations (Markese, Beebe, Feldstein, & Jaffe, 2007). In our follow-up study of these infants to young adulthood, noted above, again it was predominantly stranger-infant vocal coordination in infancy that predicted aspects of the adult attachment interview.

Why is the stranger-infant interaction so powerful? The challenge of novelty, which can be seen as a slight perturbation, can amplify aspects of a system's organization. This is similar to the perturbations of Tronick's (1989) still-face experiment, or of the Ainsworth Strange Situation paradigm for assessing attachment. Thus stranger-infant interactions may reveal aspects of development that mother-infant interactions do not.

### The Origins of Attachment: Beebe et al., 2010

In 1992 I stopped teaching at Ferkauf Graduate School. This gave me much more time for research collaboration with Jaffe. That year I also made a move from having dissertation students within a graduate school program, to having dissertation students on a less formal basis. Students gravitate to me from various universities around New York City. In collaboration with the formal chair at their home university, I informally sponsor the dissertation research. In a mutually beneficial partnership, students code aspects of our research videotapes by microanalysis, and I run a dissertation supervision group. This arrangement has continued for more than 2 decades. These dissertation students make a creative and critical contribution to our research.

In 1992 Jaffe and I began a new longitudinal study of a low-risk community sample. It was designed to examine self- and interactive regulation in facial-visual communication, my first love. We were interested in how 4-month mother and infant self- and interactive regulation worked together, as a dyadic system. We were also interested in how 4-month self- and interactive regulation might be altered if mothers were depressed or anxious, or if infants were on the way to insecure 12-month attachment.

We ran the study on a shoestring. Assisted by a dozen doctoral students, some from the Yeshiva program and some new, we filmed 132 mother-infant dyads at 4 months and followed them up at 1 year with the Ainsworth attachment assessment, completing the data collection in 1997. It took the doctoral students a decade to code the 132 dyads at 4 months, using hand-coded second-by-second microanalysis of videotapes. We coded attention, emotion (facial affect and vocal affect), orientation, and touch. Another 10 doctoral students coded the stranger-infant interactions at 4 months, over the same decade. Some of my students thought I was crazy to do such an intensive microanalysis on such a large data set.

By 1997–2000 most of the graduate students who had worked on this project had completed their dissertations and were moving on. I began recruiting students between

college and graduate school as volunteer lab assistants to help me run the lab and the research, each agreeing to a 2-year commitment. Since 2000, these remarkable, creative, and dedicated students have made an enormous contribution. I usually have a dozen or more students, and we are cozily crowded into 4 rooms. I could not have produced the last decade's research without them. Sara Markese, who joined the lab as one of these volunteer research assistants in 2000, stayed for 8 years helping to run the lab. She has continued to be an active research collaborator. Michael Ritter, who also joined in 2000, contributed 5 years helping to run the lab.

Beginning with the first grant submission in 1994, I finally received an NIMH R01 grant in 1999 to analyze this remarkable microanalysis data set. This grant enabled me to collaborate with a brilliant statistical team led by Patricia Cohen, which included Karen Buck, Henian Chen, Howard Andrews, and recently, Sanghan Lee. In the decade of the 1960s, Pat Cohen's husband, Jack Cohen, had been the statistician for [Jaffe and Feldstein's \(1970\)](#) book. Pat Cohen and this remarkable group of statisticians translated our 19,800 seconds of data of mother-infant behaviors at 4 months into our measures of self- and interactive regulation. The research could not have flowered without their collaboration.

We were able to predict attachment outcomes at 1 year from just 2 1/2 min of videotaped mother-infant interaction at 4 months ([Beebe et al., 2010](#)). This illustrates the power of microanalysis. It also illustrates the fact that relatively small amounts of nonverbal communication carry enormous information. [Ambady and Rosenthal \(1992\)](#) showed that observations of less than 5 min of expressive behavior permit accurate predictions. In their meta-analysis of 44 studies of adult communication, they found that 30-s behavioral observations were just as accurate as 5-min observations.

The most interesting aspect of my study has been the prediction of disorganized attachment at 1 year from 4-month microanalyses. Disorganized attachment at 1 year predicts dissociation in young adulthood (see [Carlson, 1998](#); [Lyons-Ruth & Jacobvitz, 2008](#); [Ogawa, Sroufe, Weinfeld, Carlson, & Egeland, 1997](#); [Dutra, Bureau, Holmes, Lyubchik, & Lyons-Ruth, 2009](#)). Mothers of disorganized attachment infants bring their own unresolved loss, mourning, or abuse ([Main & Hesse, 1990](#)). Thus disorganized attachment provides a life span trauma model. Our microanalysis findings provide a rich picture of mother-infant communication difficulties at 4 months that predict 1-year disorganized attachment ([Beebe et al., 2010](#); [Beebe et al., 2012b](#); see [Beebe & Lachmann, 2013](#)).

Four-month infants on the way to disorganized (vs. secure) attachment showed discrepant, contradictory, and conflicted patterns of communication with their mothers, in the context of intense, sometimes frantic, infant distress. These infants showed more discrepant affect, such as smile and whimper in the same second. They showed lowered self-predictability of facial-visual engagement, making it harder for them to sense their own next engagement "move," a destabilization. Mothers of future disorganized (vs. secure) infants looked away from their infants for longer periods, and looked away unpredictably. These mothers also emotionally withdrew, lowering their interactive coordination with infant facial-visual engagement. These mothers were less likely to follow their infants: less likely to become facially positive as their infants became positive, and less likely to dampen toward interest, neutral, or "woe face" as their infants sobered or became distressed. Mothers of future disorganized (vs. secure) infants at moments remained overly facially stable, or inscrutable, similar to a "still-face." When infants were facially or vocally distressed, mothers of future disorganized (vs. secure) infants were more likely to show smiles or surprise faces: a facial "denial" of infant distress. We



inferred that it was difficult for infants to feel that their mothers sensed and acknowledged their distress, and that it was difficult for mothers to empathically acknowledge infant distress. We conjectured that these mothers could not acknowledge infant distress because they could not bear their own.

Based on the findings, I proposed that 4-month infants on the way to 12-month disorganized attachment come to experience and represent *not being sensed, known, or recognized* by their mothers; and difficulty *knowing themselves*, particularly in states of distress (Beebe et al., 2010). They come to expect and represent experiences of confusion about their own basic emotional organization, about their mothers' emotional organization, and about their mothers' response to their distress. These experiences set a trajectory in development that may disturb the fundamental integration of the person.

One salient aspect of these findings concerns cross-modal discrepancies. Cross-modal correspondences facilitate information processing (Bahrick & Lickliter, 2002) and are the foundation of an early aspect of intersubjectivity, an experience that "you are like me" (Meltzoff, 2007). Cross-modal discrepancies within the infant, for example, moments in which infants are facially positive but vocally negative in the same second, disturb infant information processing and emotional coherence. Interpersonal cross-modal discrepancies, for example moments in which mothers respond with smiles or mock surprise faces to infant facial or vocal distress, not only disturb infant information processing, but also disturb the possibility of infant experiences of feeling known and recognized.

Cross-modal discrepancies are not limited to the origins of disorganized attachment; they appear in many of our studies. For example, in our community sample, 25% of the mothers endorsed depressive symptoms when the infants were 6 weeks old. At 4 months, in the depressed (vs. nondepressed) group, infants and mothers showed striking cross-modal discrepancies in face-to-face communication. Both depressed mothers and their infants showed a peculiar "noninterpersonal" gaze pattern of more time spent looking at the partner, but lowered interpersonal coordination of looking patterns. Both partners showed vigilant emotional coordination with the other. Thus both partners showed attention/emotion discordance, in lowered attention coordination but heightened emotion coordination (Beebe et al., 2008; Beebe et al., 2012a). Cross-modal discrepancies in infancy may be one salient feature of the origins of psychopathology.

However, 4-month infants at risk for 1-year disorganized attachment were much more distressed, and their interactions with their mothers were much more disturbing, than infants whose mothers were depressed or anxious. I wanted to better understand the details of these interactions that predicted disorganized attachment. With the help of Jennifer Lyne and Kari Gray, my research assistants (and both former filmmakers), I used the research findings to identify the exact moments of interactions of dyads who illustrated particular findings in the origins of disorganized attachment. For example, we located moments of maternal gaze aversion, infant simultaneous discrepant smile and whimper, or maternal overstabilized, inscrutable faces. We created frame-by-frame analyses of the various patterns of disturbance. We identified the change points of each partner's behavior that best illustrated the clinical "drama" of that dyad.

This visual grounding gave the work a visceral, intuitive, and immediate form of comprehension. With the help of my study groups, psychoanalysts interested in infant research, I watched the details of these interactions over and over. These study groups made it possible to understand the research findings in a way that made them come alive clinically. In the study groups we also explored analogies between the research findings and adult treatment. For example, we thought about infant cross-modal discrepancies of

smiling and whimpering in the same moment, and patients who tell very distressed stories while smiling.

These frame-by-frame microanalyses of the origins of disorganized attachment are so powerful that they have completely changed the way I teach and lecture. Each real-time video can be compared with the frame-by-frame microanalysis to identify subtle and complex aspects of the interaction that are too rapid to be grasped by the naked eye in real time. This advance has enabled me to understand the clinical and theoretical implications of my research at a far deeper level.

### Self-regulation and Its Relation to Interactive Regulation

One goal of the grant that I received in 1999 was to understand how 4-month mother and infant self- and interactive regulation worked together as a dyadic system. Our dyadic systems views of mother-infant communication theorize that self- and interactive regulation operate together as a system. For example, Fogel (1993) suggests that all behavior is unfolding in the individual, while at the same time modifying and being modified by changing behavior of the partner. Sander (1977) suggests that both partners generate complexly organized behavior that must be coordinated in a bidirectional process of mutual modification. Interactive regulation has seen four decades of empirical investigation. But self-regulation has been neglected.

In the 132 mother-infant dyads we filmed from 1992 to 1997, we evaluated both self- and interactive regulation. We translated the terms self- and interactive *regulation* into self- and interactive *contingency*, to more closely link these terms to our time-series methods of data analysis, and to indicate that self-contingency is not identical to the more general concept of self-regulation. Each person's behavior is affected both by his own immediately prior behavior ("self-contingency"), and by that of the partner ("interactive contingency").

Self-contingency taps *one* dimension of self-regulation, that is, the procedural anticipation of where one's own behavior is tending in the next second. It generates expectancies of the degree to which one can anticipate the rhythm of one's own behavior: how predictable, how stable, how variable one's behaviors are, from moment to moment. It spans the range from midrange degree of predictability, to overly stabilized, tending toward steady state, to insufficiently predictable or labile, tending toward loss of predictability. The process of self-contingency is so basic that it is rarely noticed, like breathing. It accrues to one's experience of temporal coherence over time.

Self-contingency turned out to be extremely important. It was often even more sensitive than interactive contingency in picking up disturbances, for example in the effects of maternal depression or maternal anxiety on mother-infant communication (Beebe et al., 2008, 2011). In the origins of insecure attachment, self-contingency helped me to conceptualize infant disturbances in knowing oneself (Beebe et al., 2010).

It is easy to mistake self-contingency for an organismic variable, a process contained entirely with the individual. Actually it is a complex amalgam of the individual and the dyad. A person's self-contingency process is specific to a particular partner. For example, in this data set, we examined how infants interacted with strangers (graduate students) compared with their mothers. We found that changing the partner altered both infant self- and interactive contingency (Beebe et al., 2009).

We also documented that, for both mothers and infants, an individual's self-contingency is itself influenced by the way the individual coordinates with the partner

(Beebe et al., 2012c). For example, less facially stable individuals are likely to coordinate more strongly with partner's facial affect (and vice versa). Thus the process of regulating oneself via self-contingency depends upon the way one responds to the partner via interactive contingency; and vice versa. The implication is that an individual's self-contingency is not solely a process contained within the self; it is bound up with coordinating with the partner. Thus the individual's own self-organizing process, as defined by moment-to-moment degree of predictability, is more influenced by the partner than we have previously realized. This work supports the dynamic systems perspective that the dyad is the fundamental unit of analysis in face-to-face interaction, and that self- and interactive regulation constitute a system in which each affects the other.

Several new collaborators are represented in this study: Daniel Messinger, Lorraine Bahrack, and Amy Margolis. As Joe Jaffe became older in the last decade, I have sought new collaborators: Michael Myers, Martha Welch, Christina Hoven, Amie Hane, Kristin Buss, Ann Bigelow, Alexandra Harrison, and Donald Pfaff.

### Microanalysis in Mother-Infant Treatment

Microanalysis is extremely useful in mother-infant treatment (Beebe, 2005). By watching videotapes with an experienced clinician, parents can learn to observe the infant's "nonverbal language," and the effects of each partner on the other.

Often a careful frame-by-frame analysis will reveal aspects of the difficulty that cannot be discerned by watching the videotape in real time. Frame-by-frame analysis itself is rarely part of the treatment; however, it powerfully informs the treatment.

One mother despaired because she felt her infant did not love her, did not even know her. She complained that he never looked at her. This is the "Linda and Dan" case, treated by Cohen and Beebe (2002). A videotape of the interaction run in real time showed that it was true that the infant was mostly looking away from the mother's face. Overall the mother's stimulation was very high and intense, and probably too much for this infant.

But microanalysis revealed a more complex story. Whenever the infant did look at the mother's face, the mother interrupted the moment. The first time the infant looked at the mother's face, in that same split-second the mother looked at the camera, with a sad face, as if to say, look what a hard job I have. By the time she looked back at the infant, he was already looking away. The second time the infant looked at the mother, she failed to greet him; her face was rather blank. But in the next moment she smiled. Even though she was late in greeting him, the infant lit up, with an open-mouth positive attention face, not quite a smile; the most positive face of the interaction. But the next time the infant looked, the mother responded with a sad partial-grimace face. And the infant immediately looked away. Meanwhile, even as the infant moved his head away and looked away, over and over he reached for the mother's hands and lightly fingered them. This description is based on 33 seconds of film.

Two critical aspects of this interaction were not visible when the film was run in real time: the ways that the mother disrupts the moment of the infant looking at her, and the ways in which the infant continues to reach for her despite looking away. This information can richly inform the treatment strategy.

## Mothers, Infants, and Young Children of September 11, 2001: A Primary Prevention Project

In this pro bono Project for Mothers, Infants, and Young Children of September 11, 2001, a group of eight core therapists worked with approximately 40 families where the mothers were pregnant and widowed in the disaster, or the mothers were widowed with an infant born in the previous year. These therapists are Beatrice Beebe, Phyllis Cohen, Anni Bergman, Sally Moskowitz, K. Mark Sossin, Rita Reiswig, Suzi Tortora, and Donna Demetri Friedman. We all knew each other in various ways before 9/11. This highly trained group of therapists specializes in adult, child, mother-infant, and family treatment, as well as in nonverbal communication. The demands of the crisis led us to expand our psychoanalytic training, fostering new approaches to meeting the needs of these families. We sought out these families, offering support groups for mothers and their infants and young children in the mothers' own neighborhoods, and bringing the families to mother-child filming sessions at NYSPI. The eight of us, in collaboration with Joe Jaffe, Sara Markese, Adrienne Lange, Andrea Remez, and Marsha Kaitz, wrote a book about this project (Beebe, Cohen, Sossin, & Markese, 2012).

We developed a 2-hr, multitherapist session, with one mother, an effort to reach these women who were so traumatized, often dissociated and frozen. Working mostly with Phyllis Cohen and Mark Sossin in this multitherapist approach, but also at times with Anni Bergman, Sally Moskowitz, and Rita Reiswig, we developed a collaborative way of building on each other's comments, that one mother called the "tri-effect." Rather than feeling intimidated, the mothers have appreciated the level of involvement and the range of views of the therapists. This format has become one of the most personally rewarding forms of therapy that I have participated in, perhaps because as therapists we provide a holding environment for each other, as we face the most wrenching, agonizing work that we have ever done.

In retrospect, I was drawn to this 9/11 work not only because I lived in New York City and was so personally affected by it, but also because of my father's involvement in the atomic bomb casualties of our time.

### Mother-Infant Microanalysis Informs My Work as a Therapist With Adults

In the last two decades I have become increasingly aware of how my microanalysis of mother-infant communication has affected my work as a psychoanalyst with adult patients. For example, in the mother-infant treatment of Linda and Dan (Cohen & Beebe, 2002), noted above, Dan at 17 months interacted face-to-face with his mother in the split-screen setup. The mother shifted his attention and substituted her own agenda for his, over and over. Then Dan interacted with me, while his parents were seated behind him, so that he was not separated from them. In the video, although Dan at first seems happy to play with me and the toys, very quickly he begins to act strange. He moves the doll in slow motion and finally becomes completely still. At first I do not seem to understand, and I give him my usual big smiles. But then a surprise expression appears on my forehead, followed rapidly by a frown. I become quiet. Only when he darts a glance at me do I move at all: I briefly show him a soft, reassuring face. I essentially give him control over the interaction. I allow myself to be completely organized by him. As long as he looks away, I wait, and I join his dampened state. Only when he glances at me do I show any movement. This interaction repeats over and over for 2.5 min.

I noticed something similar in my behavior with “Dolores,” in the adult treatment case, *Faces-In-Relation* (Beebe, 2004). In that treatment I experimented with taking a few videotapes of my face only, during the 2nd year of the treatment, when Dolores could not look at me and fell silent. In the videotape my movements are very, very slow. Only after I examined the videotape did I realize how quiet I had become. I dampen my arousal down to match hers. My body is still, but not frozen or collapsed. Dolores is very fearful and I am careful not to frighten her.

At one moment, my hand slowly moves upward on the side of my head, in a self-soothing gesture; my face shows intense focus, and subtle, soft shifts of expressiveness. I speak very softly and slowly. I wait for a long time before she responds; these are very long switching pauses in the Jaffe-Feldstein vocal rhythm model. When she speaks I strain to understand her. When I reply, out of my awareness, I match the cadence and the rhythm of her words. In these ways I show her that I join her state. After having watched myself interact with infants over the last four decades, I am aware that I slow down when I interact with infants, and I reduce my level of activity. But I had been unaware that I did this for Dolores, and I did it in an even more dramatic fashion.

Dolores and I watched the tapes together. Because she did not look at me during our sessions, seeing my face seeing her, and hearing my sounds responding to her, heightened her experience of my response and her own visceral experience. She came to recognize herself in my face recognizing her. Later we discussed more of her experience of watching the videotapes, and she told me, “You have such good faces. I have those good face-feelings. That is what is inside me. I sometimes have bad face-feelings too. Your good faces, the ‘still-lake-face,’ the ‘resting-face,’ – I like best your ‘just-watching-all-the-time-face;’ it makes me safe.”

### The Next Book: “The Mother-Infant Interaction Picture Book: The Origins of Attachment”

Because video microanalysis is such a powerful way to learn to see the details of human behavior, the moments of resonance as well as disruption, I decided to try to find a way to make it more available. Our research films are confidential. We cannot circulate them. In order to protect mothers’ confidentiality, I found a talented artist who could draw the frames of the films, preserving the emotions on the faces, but altering, for example, the hair, jaw, nose, or eyebrows. This book will be entitled, “The mother-infant interaction picture book: The origins of attachment.” Frank Lachmann and Phyllis Cohen are my coauthors.

### Conclusion

The infants and mothers are my teachers. I learned a great deal from watching mother-infant interaction. But I learned something different by interacting with the infants myself: how to slow down, how to tolerate long periods of very little happening, how to do less. I learned how to match the rhythm and cadence of the infants’ facial and head movements, breathing rhythms, or hand gestures. All of this I learned out of awareness. I became aware of it only gradually as I studied the videotapes of my own interactions with the infants, and much later as I studied the videotapes of my interactions with Dolores.



My study groups, and the seminars I teach at the various psychoanalytic institutes, are a wonderful playing field to test the ideas, to understand the films and frame-by-frame analyses better, and to nurture the integration of infant research and adult treatment.

My Ph.D. dissertation students are a critical part of my research program. They are the closest to my understanding of how to do microanalysis. They stretch my understanding of how the approaches of time-series analysis may best be used in their particular studies. They are ready to “launch” into the working world of psychology, and they are quickly becoming my colleagues and my friends. My former doctoral-level students are an active part of our research community, and some are from Yeshiva from the late 1980s and early 1990s, such as Sara Hahn-Burke and Nancy Freeman.

My lab assistant group is my research family. These devoted, creative, enthusiastic students make everything happen. In a cocreative process, many decide to go on to graduate school interested in infant and child development, and its integration with psychoanalysis.

My largest extended family are the many generous individual people who have supported my research and the 9/11 clinical project, out of their own funds. This is my opportunity to thank so many people who have esteemed my work. Many are psychoanalysts. I am enormously grateful for this support, which over the years has provided several hundred thousand dollars. Especially as federal funds become harder to obtain, these people have made it possible to keep my work going.

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