

**Close Observation of Mother-Infant Interactive Process in the Wake of Traumatic Loss:  
The September 11, 2001 Primary Prevention Project**

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**Abstract.** The 20<sup>th</sup> anniversary of the World Trade Center (WTC) disaster is a powerful moment in our history. We feel honored to be invited by Rachel Altstein to participate in this issue of *Psychoanalytic Perspectives*. In the current paper, we take a retrospective look at some early work we did with the women who were pregnant on September 11, 2001, when they were tragically widowed as the towers fell. We offer close observation of interactive process in two dyads at infant age four months in order to try to understand more about mother-infant interaction in the context of traumatic grief and loss. We narrate a descriptive story of the interactive process based on viewing the films of face-to-face interactions, first in real-time, followed by slow-motion video, followed by frame-by frame viewing in some sections. Because human face-to-face communication is so rapid, complex, and subtle, it is impossible to see the nuances of communication in real time. As the working group of *The September 11, 2001 Primary Prevention Project*, we viewed the videos together many times and gradually, through discussion, reflection and review, generated a narrative that represents our clinical view.

*Keywords:* 9/11, grief, mother-infant interaction, microanalysis, September 11, 2001

**Pregnant and Widowed on September 11, 2001:  
Close Observation of Mother-Infant Interactive Process in the Wake of Traumatic Loss**

The 20<sup>th</sup> anniversary of the World Trade Center (WTC) disaster is a powerful moment in our history. We feel honored to be invited by Rachel Altstein to participate in this issue of *Psychoanalytic Perspectives*. In this paper we are looking again at the early mother-infant interactions in dyads where the mother was pregnant and widowed on September 11, 2001. We offer close observation of interactive process in two dyads in order to try to understand more about mother-infant interaction in the context of traumatic grief.

We realized by the end of the day of September 11, 2001 that there were many pregnant women who were tragically widowed as the towers fell. How were they going to go on with life, give birth to their unborn babies, and bond with them, while they were so profoundly grieving? The attacks on the World Trade Center left over 100 expectant mothers widowed. In

this paper we take a retrospective look at some early work we did with these women who were pregnant and widowed on September 11, 2001, in the context of *The September 11, 2001 Mothers, Infants and Young Children Project*. In this paper we offer a close clinical viewing and narrative of two mother-infant interactions that we filmed when the infants were four months old. Our goal is to gain a better understanding of how the mother's overwhelming traumatic loss may be communicated in these early interactions, and how the dyad copes with this stress.

### **History of the September 11, 2001 Mothers, Infants and Young Children Project**

In the immediate aftermath of the attacks, we organized a pro bono primary prevention project, the "September 11, 2001 Mothers, Infants and Young Children Project." The therapists involved were Beatrice Beebe, Phyllis Cohen, Anni Bergman, Sally Moskowitz, K. Mark Sossin, Rita Reiswig, Suzi Tortora, and Donna Demetri Friedman. This highly trained group of therapists specialized in adult, child, mother-infant, and family treatment, as well as in nonverbal communication, movement therapy, and infant research. Most had backgrounds in psychoanalysis. We all lived or worked in New York City. We all were profoundly shaken by the attack ourselves. The 9/11 tragedy mobilized the therapeutic community in New York City. However, there was no help available for infants, the mothers of these infants, the mother-infant dyad, or any very young children in these widowed families. We hoped to fill this need.

We offered support groups for mothers and their infants and young children in the mothers' own neighborhoods. We also brought the families to mother-infant filming sessions in Beatrice Beebe's research lab at Columbia University, New York State Psychiatric Institute. The many facets of the Project, and the first decade of our efforts, were detailed in prior publications. Our work ranged from running mother-child support groups, to individual consultations and therapies, to observation of videotaped face-to-face mother-child and therapist-child play. These observations were used in the clinical prevention work when relevant. We attended to the families as they each evolved, often with new partners and new children. Multiple papers were included in a 2011 issue of the *Journal of Infant, Child and Adolescent Psychotherapy* (Beebe, Cohen, & Markese, 2011), later published by Routledge as a book entitled: *Mothers, Infants and Young Children of September 11, 2001: A Primary Prevention Project* (Beebe, Cohen, Sossin, & Markese, 2012).

In regular meetings of the therapists, we shared our collective experiences of grief. We reflected on our collaborative clinical preventive work, on our group process, and on mourning. We regularly discussed the complex nature of parenthood and development in the context of traumatic loss. We believed that the children would need to create representations of their lost fathers in order to be able to grieve their absence (Reiswig, 2012). We offered periodic two-hour consultations to each mother with three of our team members. At times other therapists, who were therapeutically involved with a particular mother, also attended. We stayed close to the mother's grief, her immediate experiences and needs. We carefully gauged the utility of video-

feedback, using video only when relevant and clinically indicated. We provided a nurturing, judgement-free environment for mothers to observe themselves interacting with their infants. These two-hour consultations were remarkable, powerful experiences for us as therapists, and they were mutative therapeutic experiences for the mothers.

Anni Bergman's emphasis on resilience in the parent-child dyad (Bergman, Moskowitz, & Demetri Friedman, 2012) was one of the theoretical keystones of the Project. Anni brought her years of experience with mother-infant therapy working with Margaret Mahler and Fred Pine (Mahler, Pine & Bergman, 1975). Her gentle, non-critical supportive presence, her belief in the power of connection and attachment, her belief in the resilience of the human spirit, provided a holding frame for the Project.

The Project has been transformative for all of us (see Beebe et al., 2012, Chapter 16). Each of us has extended what we have learned in this project to other work we do (Beebe et al., 2020; Sossin, Cohen, & Beebe, 2014; Cohen, Sossin, & Ruth, 2014; Sossin, 2002; 2018; Kestenberg Amighi, Loman & Sossin, 2018; Cohen, 2016; Cohen et al., 2016; Cohen, Hariton, & Rodriguez, 2021, in press; abpip.net; Moskowitz, Reiswig & Demby, 2014; Tortora, 2006, 2019; Bettman & Demetri Friedman, 2013).

In the current paper we revisit the early films through the lens of clinical observation/description. We take another look at videos of two mother-infant pairs taken when the infants were four months old, making every effort to conceal the identities of these dyads. Our purpose is to narrate a descriptive story of the interaction of each pair. We hoped to understand more about the influence of traumatic loss on these mothers and infants. The descriptions are based on viewing the films of face-to-face interactions, filmed split-screen, with one camera on each partner. Each film is about two minutes. As a working group, the therapists viewed the videos together many times and gradually through discussion, reflection and reviewing generated a narrative that represents our clinical view.

Mother-infant communicative events are so rapid and subtle that they are not quite grasped in real time. They occur in less than a second (Beebe, 1982). By slowing down the movements, microanalysis of film identifies beautiful moments, such as both partners rising up into glorious open-mouth smiles; as well as disturbing moments, such as maternal wary or sad faces, or infant distressed or frozen moments.

We observe both verbal and nonverbal aspects of the interaction, including pauses and silences. In the slow-motion viewing we note gestures, facial expressions, head orientations, touch patterns, changing proximities, and patterns of looking and looking away. We do so not as microanalytic coders might in a research lab, but as parent-infant therapists seeking to describe relevant behaviors. We consider the complex ways in which both partners make reciprocal efforts to connect and share intentions and feeling states. We attend to ways in which concordances and discordances, ruptures and repairs, unfold. We try to understand what we see through the lens of overwhelming grief. Throughout our viewing and reflecting, we have kept in mind Anni Bergman's emphasis on resilience in the parent-child dyad (Bergman, Moskowitz, & Demetri Friedman, 2012).

Below, you will see that we are careful to distinguish *what we observe* in the videos from our *comments* about what we observe, which reflect attributions of possible meanings. The narratives are purposely presented in a semi-transcription format, which we hope will cultivate an atmosphere of watching us watch the films as you read. We encourage you to visualize the action-sequences in your own minds.

## **MOTHER-INFANT VIGNETTE ONE: MOTHER AND HENRY**

### **Real time viewing**

As a group we watch this video over and over in real time. We are struck with glorious smiles early on in the interaction. The infant Henry has an adoring look, and a big smile for his mother. The mother also has a wonderful smile for her infant. We also see a mother who is interacting by entertaining, working hard to evoke the glorious smiles. We sense an urgency to connect behind the mother's entertaining, a desperation for Henry's smiles.

### **Slow-motion viewing**

Following the glorious smiles, the mother looks at camera several times. We did not see this in our real-time viewing. When mothers look at the camera, it is as if to say, *please help me, this is really hard for me*. Then we see that, after the glorious smiles, Henry dampens his face so fast, compressing his lips. But the mother's big smile continues. We comment that this is a mismatch between the infant's dampened face and the mother's big smile. We wonder why the infant's smile dampened so abruptly. We look again and we see that Henry sobers at the moment that the mother looks at the camera.

Henry then reaches for the mother's chin. We wonder if Henry's reaching for mother's chin is an effort at re-engagement, a response to the mother's looking way. The mother now takes the infant's hands off her chin, and she shakes his hands. We wonder about this pushing the infant away from her chin.

A second moment in which the mother looks at the camera now occurs. Again we interpret the mother's looking at the camera as a request for help, most likely out of her awareness. Now the mother returns to look at her infant, and Henry has an interest face with positive attention and slightly open mouth. The mother responds with a big smile. Now Henry sobers to a neutral face, but mother's big smile continues. We comment that this is another moment of mismatch. The mother has difficulty joining the infant's dampening affect.

Henry now smiles briefly and then abruptly looks away, and then looks down, with a dark negative face. Mother now goes into Henry's face, touching his face with her hands. We muse that this is the mother's need for the infant to stay engaged. But as the mother touches Henry's face, the infant turns his head away and does not look. The mother continues putting her hands into Henry's face. We comment that this is unusual, a difficulty reading the infant's head aversion as a communication of "no;" a difficulty accepting the infant's need for re-regulation of

arousal. Looking away is a key infant coping capacity, a way of down-regulating arousal (Field, 1981).

Henry continues to hold his head away, not looking. Now mother again sings the song, London Bridge is Falling Down, with big hand gestures. We comment that it seems mother shifts to the song to try to get Henry back (rather than accepting his need for re-regulation of arousal). But now the song seems to succeed in re-engaging the infant. Henry looks with a big smile, and the mother responds with a glorious smile. Henry increases his smile into a huge open-mouthed “gape smile.” We comment that this is a moment of tremendous resilience on Henry’s part. It is a reflection of his powerful and often positive connection to his mother.

Quickly and unexpectedly Henry sobers, looks down, and moves his head down and away. We wonder about Henry’s sudden, abrupt head aversion, the third one we have noted. We wonder if the infant is having difficulty with regulation, and thus reverts to more sudden and total re-regulations. At this point, while Henry is still turned away, the mother’s hands go into his belly. He remains turned away. Then the mother sings the song, London Bridge is Falling Down again, and her hands gesture widely. We interpret this move as an effort to get the infant back.

Henry watches the mother’s hands with his mouth open, and then he breaks into a big smile, which turns into a huge, glorious smile. But suddenly Henry turns away, sobering. We comment on this. It again seems so abrupt. We view it as a sudden down-regulation of arousal, and we wonder why the infant goes from glorious smiles into such abrupt withdrawals. It signals infant distress.

The mother then looms into the infant’s face, and then “chases” him as his head moves from one side to the other side. We comment that this is a “chase and dodge” sequence (Beebe & Stern, 1977; Beebe & Lachmann, 2002). Henry now moves his head to other side, and the mother chases. Now Henry turns his head and body a full 60 degrees away, but the mother follows him and looms into his face. We talk about the mother’s difficulty in accepting the infant’s nonverbal “no.” She keeps going. She does not seem to have confidence that he will return on his own, without her assiduous pursuit. Perhaps she feels a resurgence of loss as her infant turns away from her. We muse that perhaps the infant’s need to abruptly turn away and down-regulate has to do with the mother’s high level of stimulation, such as this chase and dodge interaction, that generates too much arousal.

Henry continues to orient away. Mother now takes his hands. The infant looks at his mother’s face, but he does not respond with a smile. Now Henry stares, glazed over. We comment that this behavior seems to indicate that the infant is changing his state to defend against over-stimulation. During this moment of the infant’s glazed state, the mother has a big smile. We comment that this is a big mismatch. Henry continues to be turned away, shut down. But the mother is still smiling.

Now the mother moves close in toward Henry’s face and she has a tense mouth expression. Henry continues to hold his head down, not looking. We comment that we all feel the drama of this moment. The mother vigorously shakes Henry’s feet. The infant does not respond. Now he has a flat, expressionless face, then a sad face. Then he looks blank. The

mother continues vigorously shaking Henry's feet. Now the mother smiles and looms into Henry's face. Henry reaches for his mother's face, but the mother moves back out of his reach. The infant now has a negative face, which continues for several moments. The mother now looms again into Henry's face.

Now the mother looks at the camera again. We comment that she knows that something is awry. Henry is completely unresponsive, blank. Then he looks at his mother with a flat face. Mother smiles broadly and takes the infant's hands. The infant shows a surprise face. Mother begins to sing. Henry smiles! Both now smile. We comment that this is a remarkable moment of resilience for both of them. We note that the mother's singing often seems to help the infant re-engage.

The infant reaches for his mother's face, but again the mother moves back quickly, out of his reach. She takes his hands and moves them down. The infant looks at his mother with compressed lips, a sign of tension. But mother smiles broadly. We comment that this is another mismatch. Henry now moves his head down, with a flat face, not looking. His face takes on a negative expression. Mother now moves her head from side to side, chasing the infant's gaze. But Henry stares, with a flat face. He looks glazed over.

For the first time, mother now moves her whole body back, giving Henry a little more room. Henry responds by looking, with a hint of a smile. But quickly Henry moves his head down, and away, with a flat face. Again, mother chases Henry's gaze, moving her head from side to side. Henry moves his head down and away now on the other side. His face is distressed, with pouted lips.

Mother takes Henry's hands and shakes them. She has an asymmetrical facial expression, conveying a slight negative affect. Henry now looks, and there is a moment of mutual gaze. But quickly mother looms into Henry's face. Henry stares with a flat face, then moves his head away, not looking, continuing his flat face.

### **Discussion of Vignette One**

Like all mothers in the Project, this mother is faced with the terrible contradiction of love for her child while attempting to manage her own overwhelming grief. Overall, this is a story of maternal over-stimulation/intrusion and infant withdrawal, but it is punctuated by some glorious positive moments. Henry is intermittently responsive and seeking of connection. The fact that there is at times a gratifying engagement between them indicates a significant potential for resilience in both partners.

This mother and infant continuously slip into a "maternal chase – infant withdrawal" pattern. But they work very hard over and over to repair it. The mother's singing is often very successful in re-engaging her infant. We noted that the mother had a more rapid rhythm of speech and movement than the infant. The mother had a hard time waiting for the infant's slower rhythm of looking away and looking back. Our association was that waiting for the baby to come back might evoke painful longing feelings of waiting forever for the husband to come back.

After the first moments of glorious smiles, the mother has trouble tolerating the moments that Henry looks away. Looking is arousing. Looking away functions to down-regulate arousal, and it is a key infant coping method (Field, 1981). But following the infant's face and head aversions, the mother pursues, disturbing the infant's ability to regulate arousal (Beebe & Stern, 1977). We are struck by the mother's need for the positive engagement, but also by the ways in which she seems to disrupt this engagement.

As a group, we think of this urgent need to animate the infant into high-positive smiles as a maternal grief reaction. Perhaps it is an effort to reassure herself that "everything is ok," that her infant loves her, and that she loves her infant. Perhaps she is struggling to maintain her loving connection to her husband despite his sudden death. The mother's urgent need for the infant's smiles echoes the theme of "urgent engagement" documented in the empirical microanalysis of these dyads (Beebe et al., 2020).

A more secure state of mind on the part of the mother would likely have conveyed more trust in the infant's return, more ability to recognize the infant's effort to self-regulate by exercising some control in the interaction. Here the mother seemed to experience her son's turn-away as a rejection, possibly elevating the threat of loss. But mother chasing her son seemed to elevate his distress, and his need to turn away. We imagined that she feared (on some level) that her infant would not return.

The mother's state of mind during this period of acute loss and mourning made it difficult for her to tolerate the infant's moments of looking away. We surmise that the mother's grief lies beneath her inability to tolerate the infant's ordinary ebb and flow of engagement and disengagement. The song she sings is poignantly emblematic of this. In the full lyrics of the song, not only is there a structure "falling down" but "iron bars [that] bend and break." The mother had difficulty allowing her infant to touch her face. Touching the face is intimate, perhaps what her husband would do. It might be difficult in her grief.

Despite these difficulties, Henry continually returns to look at his mother. However, toward the end of the interaction, the mother cannot read the infant's communication, and the infant shuts down. He resorts to a nearly inert or de-animated state. His eyes glaze over. His typically activated musculature falls into "neutral flow" (too steady-state and de-animated), perhaps understood here as an early precursor of a dissociative defense. We understand this as the infant's effort to cope, calling upon the tools that he has.

Overall, despite so many moments where it looks like the connection might be lost, we are impressed that, over and over, both retain the positive connection. Despite the many moments of difficulty, both keep coming back to each other. Thus, there is a powerful potential for resilience in this dyad. We think of Anni Bergman, and her sensitivity to the resilience of our 9/11 families.

## **MOTHER-INFANT VIGNETTE TWO: MOTHER AND AMANDA**

### **Real Time Viewing**

The film begins with the mother's beautiful smile when her infant Amanda looks at her. There is a real sweetness that we see in this mother as the film begins. Much of the interaction is focused on the hands. The mother offers her hand to Amanda and instructs her on how to count mother's fingers. As the film goes forward, we see something else. Mother's face dampens into more distant looks, with a steady-state quality. We wonder if this indicates her sadness or grief. But looking over the whole film several times, we notice that in between these steady-state moments, she lights up for Amanda frequently.

### **Closer Real Time Viewing**

Now we look at the interaction more closely as it unfolds in real time. Again, we see these beautiful moments in which the mother lights up when the infant looks, and both frequently sustain mutual gaze moments, often with radiant smiles.

As the film goes on, the hand play becomes more prominent. Both are focused on the hands and the face-to-face moments become less frequent, and more fleeting. We notice that the mother looks at the infant a great deal, but her looking pattern rapidly shifts from the infant's face to their interacting hands, and back up to the infant's face, a frequent shifting between looking and looking down. We note that this looking pattern is unusual. Mothers are more likely to sustain long periods of looking at the infant, and to look away more rarely.

The hand play has an instructional quality. The mother seems to be talking to Amanda as if she were an older child. Mother's talking does not have the usual prosodic variations and slowed rhythms of "motherese." Gradually we notice an edge in her tone, which seems to have a directive quality, a demand quality, in addition to the moments with a playful quality. As the session goes on, Amanda remains mostly focused on the hands, with brief gazes to mother.

When Amanda does gaze at the mother, the mother lights up and holds the gaze. But in between these moments of lighting up, we notice that the mother seems low-key, and her face takes on a steady-state, flat, wary quality. We wonder if this infant might be looking at the mother's face more frequently if there were not so much downward focus on the hands. Or perhaps it is the flat quality in the mother's face that Amanda might be turning away from. Toward the end of the interaction the infant becomes distressed. The mother accepts this distress in Amanda.

### **Slow Motion Viewing**

Now we take an even closer look, viewing the film in slow-motion and at times frame-by-frame. It is fascinating to see what the slow-motion viewing reveals that is not perceptible in real-time. As we begin, both Amanda and mother are looking at mother's fingers, playing with the fingers, and both have open-mouth expressions of engagement which carry a hint of a positive quality. Amanda actively grasps mother's finger. Amanda now shows a slightly negative face, slightly down-turned corners of her mouth, which then becomes a tight, compressed-lips expression. As this occurs, the mother's brow tightens and her face takes on an "uh-oh," slightly

pouted expression. We comment that the mother is tracking these slight infant negative shifts so carefully, and she is very reactive to them.

We watch this moment again frame-by-frame. We gradually realize that only a very fine-grained viewing will allow us to see the complexity of this interaction. Now we see that a slight disruption of the infant's hand play had occurred during this moment. Initially the infant took the initiative in holding and moving mother's finger. But at the moment of the infant's negative facial expression, the mother had taken the initiative and moved her whole hand in a larger gesture. During this movement, Amanda lost control of the mother's finger.

Mother moves her hand again, moving the infant's hand which is now clasping her finger. The infant becomes a bit more negative. We note this is the second time the infant becomes negative following the mother's disruption of Amanda's control of the finger movement. The mother cocks her head to the side, and her face looks questioning, wary, stern. Amanda looks up at her mother. Amanda's negative expression starts to melt into an open-mouth expression of engagement. But mother does not greet her infant. Mother looks at Amanda but her face is steady-state, conveying a wary, stern quality. We comment that mother's failure to respond in a welcoming way to Amanda's gaze creates a moment of extreme disaccord. A steady-state face carries a de-animated, neutral flow movement quality (Sossin, 2002, 2018). It interrupts the usual micro-momentary split-second responsiveness that is found in both partners (Beebe, 1982; Stern, 1985). A steady-state conveys a wary, stern quality, but also an unreachability quality.

Mother continues to look, but her head now angles to the side, a partial orienting away, continuing to show a wary, steady-state expression. The infant's open-mouth expression of engagement now shifts, her mouth closes, her head moves back, and she looks down. We comment that Amanda turns away from the mother's steady-state, wary look; that Amanda has been rebuffed. To this point we have examined only the first 9 seconds of the interaction.

Both mother and infant look down at their hands. Amanda is the one who takes the initiative and moves the mother's hand, and mother lets her. Amanda grasps another of mother's fingers with her other hand, and she looks intently at the fingers. Mother also looks at the fingers, and her face has a slightly negative expression. We wonder what the mother is thinking. Is she worried? Amanda now looks at her mother. Mother abruptly looks at Amanda, and intensely opens her eyes, showing the whites of her eyes, in an exaggerated, over-charged expression. Widening the eyes so that the whites of the eyes are visible indicates arousal, which may be surprise, fear, or sometimes threat. The mother's lower face, however, is momentarily still, conveying a mismatch within her face.

Mother's expression moves into a mock-surprise face, and then into a wide-open "gape smile." But at the moment of the mother's smile, Amanda looks away. We comment that perhaps Amanda looks away because this sequence, from the mother showing the whites of the eyes, to the mock surprise face, to the wide-open gape-smile, is too arousing for her. Amanda now lets go of one of mother's fingers, and then she reaches for mother's other hand. We comment that

Amanda can use the hand play when the mutual gaze encounter does not work out well, and that this is an important source of resilience in the dyad.

Mother's face sobers, and then shows a fleeting negative expression, which the infant does not see. We comment that the mother's negative face may reflect her disappointment that her smile did not succeed in engaging Amanda. We are now about 17 seconds into the film. We see another negative expression at second 22 and another at second 24.

At second 28 Amanda looks at her mother, mother returns the gaze, and the dyad flowers into a remarkable, delightful, sustained engagement, with mutual gaze and mutual smiles, and it lasts for 8 seconds. We feel encouraged. This mutual positive capacity is a critical source of resilience. Amanda now looks down at the hands and takes the initiative, moving mother's fingers, seconds 36-39. We see the mother's face gradually dampen into another fleeting negative expression. We muse, is the mother's negative expression a reaction to Amanda's looking away, or to Amanda's taking the initiative in the hand play?

Both now look and light up into smiles (seconds 40-41), a mutually positive moment. Mother then shifts into another high-arousal exaggerated expression, showing the whites of her eyes, and her head and body move forward. Amanda quickly looks away to the mother's fingers, which she has not let go of. Mother now also looks at the fingers, joining the infant. We comment that this is a pattern in which the mother greets with exaggerated high-intensity, and Amanda then looks away. But the finger play provides another way of connecting for them both.

Still looking at the mother's fingers, Amanda moves one of them. But when mother then moves the finger that Amanda is holding onto, Amanda lets go. We comment that Amanda does not seem to like losing the initiative or control with the fingers. Amanda is still holding onto another of mother's fingers with her other hand. Now there is a dance where first Amanda moves the finger, then mother moves it, then Amanda moves it.

Then Amanda looks back up at her mother. Mother greets Amanda with wide open eyes, again showing the whites of her eyes (second 47). Amanda then moves mother's fingers up forcefully, lending her whole body into the movement, and then turns away and looks away, with compressed lips. As Amanda begins this movement, mother's head cocks to the side, looking wary, and her expression sobers. Now the infant moves her head to the vis-à-vis but moves her head much further down, collapsing a bit into her chest, still not looking (second 50). They both look at the hands and play with the fingers. Amanda then looks back at mother's face. The mother looks but does not greet. Her face remains sober (second 56.5).

Now mother lights up, and smiles. This greeting comes late, but it is very positive. Amanda now smiles in a lovely way, but then she quickly looks away. We comment that the mother's initial lack of greeting, and then greeting late, seems to have disrupted the infant's ability to maintain the engagement. However, the dyad keeps returning to positive moments.

To this point (second 60 – the first minute) we have been looking at the film with a very fine-grained approach, capturing changes as fast as approximately 4x per second. Now we change our approach somewhat, and we look approximately second by second.

Both are looking at the mother's hands. Amanda then initiates a gaze at her mother's face, and mother joins the gaze. Then both open their mouths. An open mouth generally indicates an openness to engagement. After 2 seconds of mutual gaze, Amanda breaks the gaze and looks down. Both look at the hands. But one second later mother has a grimace. Mother shifts her gaze from their hands to her lap. We comment that the mother's grimace seems to be a reaction to Amanda looking away.

One second later Amanda *again* initiates a gaze. Mother immediately joins her gaze, but with a flat face, again a failure to greet. Suddenly mother smiles. Amanda looks but doesn't smile. Mother now shows rapid repetitive mouth opening and closing (likely an effort at arousal regulation) and then resumes her smile. Amanda looks all this time, for 9 sustained seconds, without smiling; then she looks away. We comment that, even though Amada does not smile here, it is a important moment of sustained visual engagement.

Both now look at the hands. Mother remains smiling while looking at their hands, and she moves them. Amanda begins to orient her head down to her right, 45 degrees away from the vis-a-vis. One second later Amanda makes a slightly negative face, a grimace. Mother's face sobers. Then Amanda pulls her left hand away from mother's fingers, arching back somewhat. This whole movement away takes about 4 seconds. Now mother reacts with an "uh oh" face. One-half second later mother grimaces with a pout quality. We comment that perhaps Amanda's grimace was a reaction to mother's moving the hands. Mother again reacts to Amanda's looking away with a negative expression. But the hand play continues to provide another way to connect. Both resume the finger play, looking at the fingers. Mother moves her own fingers and Amanda holds onto one of mother's fingers.

After 5 seconds of finger play, Amanda looks up, initiates a gaze, and mother joins the gaze. Amanda has a pleasant interest face. But as Amanda's head moves ever so slightly to her right, mother looks askance, with cocked head, conveying wariness, as if to say, *where are you going?* Amanda now *does* move her head away and she looks away, one second later. We comment the mother was correct in her anticipation of Amanda moving away. In retrospect we see mother's close tracking of the infant as her attempt to manage the feeling that the infant is moving away from her. We muse that it must be hard to tolerate the infant's ordinary moments of looking away in such a state of loss and grief. We are now 88 seconds into the interaction.

One second later Amanda makes a negative face, an upper lip curl. During this moment, as the infant is grasping the finger of mother's hand, mother is moving this hand. We comment that perhaps Amanda's negative face is a reaction to her loss of agency. Mother sobers 2 seconds later. One second later Amanda re-orientes to the vis-à-vis and intently looks at mother's fingers with a serious face. Mother also looks at the fingers with a serious face. A second later Amanda moves her head 90 degrees to the other side (her left), a strong head aversion, and then she rapidly returns to the center vis-a-vis, but with her head down. We comment that perhaps Amanda here may still be reacting to the loss of agency in the hand play. Nevertheless, both continue to use the hand play as a key form of connection.

Two seconds later Amanda now makes a pull-to-sit gesture. Mother asks: “Do you want to sit up?” Mother helps Amanda pull up. The infant looks to the left, then re-orient to the vis-a-vis, but all this time Amanda is looking down. Three seconds later Amanda initiates a gaze. Mother returns the gaze with a very sober face, and a hint of a grimace, a failure to greet. The mother seems worried. Immediately Amanda opens her mouth and moves her head up, an engagement gesture, and the mother then also opens her mouth, a fraction of a second later. A wonderful moment of greeting ensues. Mother shows a mini-mock surprise expression, and Amanda has a rapt look, with an open mouth. This moment flowers into wonderful full smile of the mother. We comment that this is a beautiful moment for them.

Now Amanda looks down at the hands and shifts her hand play. Amanda takes her right hand away from mother’s left hand, and Amanda uses both her hands to grasp the finger of the mother’s right hand. Mother now has a very serious face. Then mother’s face has a wary expression. We comment that the mother seems very sensitive to moments when Amanda initiates the hand play. Both now watch the finger play for almost 3 seconds. Amanda looks up from the hand play and gazes at her mother. Mother looks but does not greet. Then mother talks to Amanda. From the film we know that mother is instructing Amanda on the hand play here. We comment that the typical delight mothers take in following the infant’s lead does not work for this grieving mother. Amanda now looks down at the fingers, and mother has a slight grimace expression.

Amanda had both hands on one of the mother’s fingers, but now mother moves the hand Amanda is touching. Amanda then frees her right hand, and she turns her head away. Mother’s hands now shift Amanda back to the midline; Amanda is still looking at the fingers. Now Amanda looks up at mother, but mother does not greet. Mother’s face is wary. One second later, Amanda looks away and orients away to her right. We wonder whether Amanda’s turning away here was a reaction to the mother not greeting her, instead showing a steady-state wary face.

Mother then offers her hand. As Amanda begins to curl her fingers around one of mother’s fingers, mother’s face loses the wary look and her mouth opens slightly with a hint of positiveness. But then Amanda moves her head to her left, through the vis-a-vis without looking at mother, while, during the same moment, mother looks at Amanda. Again mother’s face sobers and becomes wary, with a flat, steady-state quality. Amanda’s head now averts almost 90 degrees to her left. This is a rare moment when Amanda does not meet mother’s gaze.

Amanda again makes a pull-to-sit gesture. Amanda is not looking, and her head is oriented 30 degrees to her left. But now Amanda re-orient to the vis-à-vis and looks. Mother smiles warmly. There is a moment of mutual gaze, and Amanda has the beginning of a smile, with an entrancing look, almost like a look of wonder as her body leans forward, and she has to look up to meet the mother’s gaze. This is another lovely positive moment in the dyad.

But now Amanda’s head moves down and she looks away. Again, mother’s face becomes flat, steady-state. At this point Amanda becomes fussy and mother makes empathic sounds. Here the mother is able to respond to Amanda’s distress. Amanda then becomes overtly distressed,

facially and vocally. Again mother reacts with a flat, steady-state face. We comment that mother does not respond to Amanda's distress here and she seems remote.

The mother's face now shows anguish.

### **Discussion of Vignette Two**

Periodically, this mother emotionally rises to greet her infant, and she not infrequently flashes a big smile. At times, mother and infant both show beautiful mutual smiles, and they seem very emotionally connected. This reflects an important resilience in the dyad.

We are particularly interested in the looking patterns. Infants and mothers are sensitive to the partner's direction of gaze. Gaze at the partner's face signals the possibility of an interaction; it is the foundation of the face-to-face encounter. Typically, mothers look most of the time, and it is the infant who looks and looks away. When the infant looks, generally mothers return the gaze, creating a moment of mutual gaze; when the infant looks away, typically mothers wait a moment until the infant re-regulates and returns to the mutual gaze encounter (Beebe et al., 2010; Stern, 1985).

There are many moments when Amanda and her mother do not sustain visual engagement. When Amanda looks, mother sometimes responds in an exaggerated, highly aroused manner, showing the whites of her eyes. This exaggerated greeting seems over-arousing for Amanda, who then cannot sustain the gaze and looks quickly away. We suggest that showing the whites of her eyes reflects the mother's own over-arousal when she looks at Amanda's face. At other times, when Amanda looks, mother looks away from her infant's face, which is unusual. Even more frequently, when Amanda looks, mother looks but fails to greet, fails to light up with delight as mothers usually do. Instead, mother's face shows a steady-state quality, conveying sternness or wariness.

We conjecture that this mother cannot respond in the typical way when Amanda looks at her because looking at Amanda's face triggers her own grief. The infant's face may be an elicitor of grief because it evokes her dead husband's face. Or the infant's face may simply evoke his absence. The mother's grief reaction, a heightened arousal, may be reflected in her exaggerated greetings showing of the whites of her eyes. Moreover, over-stabilizing the face, metaphorically "closing up one's face," interferes with emotional processing (Hennenlotter et al., 2009) and can function to down-regulate arousal. This mother may shut down her own emotional processing, in a momentary dissociative process, to defend against her grief.

However, Amanda may experience these moments as an affective wall. The infant may have difficulty feeling known by her mother in moments when she looks, and her mother fails to greet. Or she may have difficulty feeling known by her mother when she is distressed, and mother shows no reaction, and she may learn that her distress states are not shared, which may accrue to later experiences of "not-me" (Beebe et al., 2010; Stern, 1985).

The hand play provides a critical alternative form of engagement for this dyad, a transitional space. When the mutual gaze encounter does not work well, both infant and mother together return to the hand play. In this sense, the hand play provides a form of "repair" for the

difficulties in achieving sustained mutual gaze moments. It allows them to stay engaged and does not require as much relational connection as more direct face-to-face mutual gaze.

Both Amanda and mother are reactive to the level of control they have in the hand play. When the mother moves the hand Amanda is fingering, Amanda often reacts with gaze aversion, head aversion, or facial distress. The mother is sensitive to this distress in Amanda, but it likely remains out of her awareness that the issue may be Amanda's agency in the hand play. These intermittent fleeting moments of distress in Amanda seem to make the mother insecure. She reacts with wariness. For her part, the mother is also sensitive to her own agency and level of control in the hand play. When Amanda initiates a shift in the hand play, the mother shows a serious face, a negative face, or a wary expression.

We also note that there is at times an edge or demand quality in the mother's voice, rather than the usual prosodic "motherese," as she instructs Amanda to count the fingers and moves her own hands to illustrate. Becoming directive steps away from following the infant, which would likely involve more eye-to-eye contact. Becoming directive can also be a way of coping with the ambiguity of unscripted play and may lend a structure that provides some protection against the intrusion of loss. Hence, becoming directive may be a way of protecting both of them from her distress.

Toward the end of the interaction the infant becomes increasingly fussy. The mother is initially able to empathize, but in the final moment in which Amanda is distressed, the mother cannot respond. We muse that when the mother's own distress is so raw, it must be so difficult to empathize with the infant's distress, and to offer comfort. To remain empathic to her infant distress might re-evoked the mother's own traumatized state. In the final moment, the mother's anguished face alerts us to the depth of her trauma.

Overall, however, both work together collaboratively to connect, despite the difficulties. This is an important source of resilience. They shift back and forth between the mode of the face-to-face mutual gaze encounter and the hand play. Occasionally the mutual gaze encounter is very successful and they create a moment of sustained mutually positive smiles. When the mutual gaze encounter does not work, they reliably re-engage in the hand play. They both return from momentary retreats. They both work hard to sustain the connection. The infant does not shut down. Together they keep the dialogue going.

## **General Discussion**

Social communication in general, and parent-infant interaction in particular, takes on affective, temporal, spatial, and intensity qualities. Research contexts for over four decades have documented that this nonverbal system is organized by a rich and varied split-second dialogue in which each partner's behavior affects that of the other (Beebe et al., 2010; Jaffe et al., 2001; Sossin & Birklein, 2006; Stern, 1985, 2010; Tronick, 2007; Trevarthen, 1998). Such research has not only influenced developmental psychology's understanding of infant competence, but it has also led to fundamental changes in developmental psychoanalytic theory (Beebe & Lachmann, 2002; Emde, 1999). This work has bridged psychoanalysis with attachment theory (Fonagy,

2001; Lyons-Ruth, 1999), relational and self-psychological clinical practice (Boston Change Process Study Group, 200; Knoblauch, 2005), and nurtured new techniques in parent-infant psychotherapy (Avdi et al., 2020; Baradon, 2005; Cohen & Beebe, 2002; Stern, 1995).

A confluence of microanalytic mother-infant research and psychoanalytically-framed parent-infant psychotherapy served to cultivate the method of observation that we applied here. We viewed real-time video, followed by slow-motion video (generally 25% timing), followed by frame-by frame viewing in some sections. Because human face-to-face communication is so rapid, complex, and subtle, it is impossible to see the nuances of communication in real time. It is much faster than our conscious and verbal processing can keep up with. Limbic, amygdaloid, and prefrontal-cortex responses to affective signals are extremely rapid (Kim, 2016; Leckman et al., 2004; Ohman, 2002).

In this grief-laden context, in the first dyad, the mother's need for Henry's positive engagement was striking. But at the same time, she often disrupted this engagement. We suggest that this need to animate the infant into high-positive smiles is a maternal grief reaction. We saw this pattern in other dyads in our project as well. We understood this pursuit of high-positive smiles as the mother's effort to reassure herself that "everything is ok," an attempt to move away from her despair. We see this dyad as illustrating aspects of our "urgent engagement" model of trauma documented in an empirical analysis of these dyads (Beebe et al., 2020).

We saw in the second dyad moments in which the mother dampens, "leaves," becomes momentarily unavailable, not as a function of disregard, but rather as a function of the grief the infant stirs in her. We argued that looking at the infant re-evoked her trauma of losing her husband. The infant's appearance, eyes, gesture, quality of touch, or facial expressions potentially elicit a deeply-felt memory, representation, or association to the lost spouse. The infant may evoke his absence, the unshared parenting, or something specific the couple had shared.

We propose that these disjunctive moments, for example, when the mother fails to greet the infant's gaze and instead shows de-animated, steady-state faces, become repeated and predictable to the infant, and may be modes of transmission of loss. These disjunctions filter into the child's evolving internalized bodily representation of the mother. The infant comes to know about behaviors that stir sadness, retreat, or de-animation in the mother. Over time they may also filter into newly created representations of the lost father. These disjunctions, but also the infant's effort to re-engage following these disjunctions, become core elements in the mother's evolving internalized representation of the infant as well.

We know from observations outside of this Project that mothers are selective in what they join or amplify in mirroring their children. In this Project, we came to view this selectivity as largely skewed by loss. It often seems hard to join infant distress and to tolerate infant self-regulatory look-aways. For some, there may be a superordinate investment on the mother's part in eliciting positive affect. It is as if the mother's longing to be enlivened by her infant's smiles prevents the mother from waiting for the baby to return. This exaggerated maternal effort at engagement can be counterproductive, both through a loss of authenticity, and through over-

arousal of the infant, for example, when mother responds to Henry's turn-away by shaking his feet and looming into his face.

Of course, grief is not manifest in a singular pattern of mother-child interaction. Across the Project, we observed a number of dyads in which looking at the infant seemed to be temporarily assuaging, now and again manifest in an avoidance of pauses. In such dyads, it was in the non-engaged moments when a sadness permeated the mother's countenance (see Tortora, 2012). For other mothers, such as Amanda's, returning the infant's gaze itself was a trigger for grief, amplifying the sense of what was lost. Entering into preventive or clinical work, recognizing such differences are pivotal in planning interventions.

In both cases reviewed, we see intricate repairs and recoveries. We see heightened efforts by both mother and infant to re-engage. The infants of the Project, exemplified here, worked especially hard toward such re-engagement. It is this resilience that we try to foster in early parent-infant traumatic grief work.

It seems to us that the infant "knows" that the mother bears no ill will in moments of absence or in moments of exaggerated attempts to solicit smiles. It is as if the infant reads the mother's intent to rejoin her infant, following these moments. Perhaps it is this reading that facilitates the infant's efforts to initiate and rekindle repairs. Future study may clarify the continuities in these early patterns and how they may shape personality development.

For now, the hopeful conclusion from our second look at these two immensely resilient 9/11 mother-infant pairs is that each partner makes an intense attempt to find the other through the trauma and grief.

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