

Interactive Mismatch and Repair:  
Challenges to the Coping Infant

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Researchers on infancy-we among them have typically talked about mother-infant interaction in terms of synchrony, reciprocity, matching, coherence, and attunement. These descriptions attempt to capture those

periods of engagement that say that all is well in the

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young infant-mother partnership. For the individual

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they are times of pleasure and delight.

We expected to see many such periods as we studied face-to-face interaction of 18 normal mother-infant pairs when the babies were 3, 6 and 9 months old. Our study population was in many ways optimal: mothers had averaged two years' post high school education; infants had been born after uneventful pregnancies; all were from intact families and lived in the bucolic surroundings of Amherst, Massachusetts.

But our videotapes of mother-infant interactions had some surprises in store.

- First, infants were in social play only 15% of the observation time at 3 months, 13% at 6 months, and 25% at 9 months.

Much of the material in this article was delivered by Edward Tronick in his December 7, 1985 address at the Fourth Biennial National Training Institute of the National Center for Clinical Infant Programs in Washington, D.C.

- Second, the variability of play among these infants was quite large.
- Third, the proportions of observation time that infants and mothers were in matching behavioral states for example, mother in play and infant in play; mother and infant looking at one another; or mother and infant sharing attention to objects-were 28% at 3 months, 30% at 6 months and 34% at 9 months. We define such matches as acting the same way at the same time.

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When we examined matched periods of play alone, the proportions were even smaller-13%, 10% and 21% at 3, 6 and 9 months. The variability, again, was large. (Figure

1).

SUBJECTS AND PREDICATES

We wondered about this large portion of the time when mother and infant were not displaying positive emotions and especially about the 70% of the time when mother and infant were not in matching stage, were not in synchrony.

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"Stress builds character"

Our view begins with the injunction New England has been preaching to the rest of the country for years:

Proportion of Mother-Infant Matches in Any State  
(Any Match), Matches in Social Play (Soc. Match)  
(with Standard Deviation)

PROPORTION

OF TIME

34.0  
35 30.5

---<M)

28.3~M)\_\_\_\_\_ .

30  
(M) 21.5

25

50 C)

20

13.8  
15

10.76

(SOC)\_\_\_ . /  
10 ~SOC)

5 so = 13.7 so = 9.3 so = 15.8  
0

o36 9

MONTHS

Figure 1

stress builds character. Specifically, there is often a mismatch between the infant's expectations and the state of the interaction, or between the behaviors of the partner and the behaviors of the infant. These

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mismatches stress the infant by generating negative emotions, but the infant has coping behaviors for repairing them to turn a mismatch into a match and the negative emotions into positive emotions. Developmentally, the experience of repairing these mismatches has several positive benefits for the infant. First, the infant's sense of effectance or mastery is increased. Second, his coping capacities are elaborated. And third, following Spitz's formulation, with the reiteration and accumulation of the experience of successfully repairing mismatches in his daily interactions with his mother, the infant internalizes a pattern of interactive coping that he brings to interactions with other partners. Indeed, to the extent that the infant successfully copes, to that extent will the infant experience positive emotions and establish a positive affective core.

But there is a darker side to the New England  
.-injunction: the infant who employs his coping strategies  
';,.•uccessfully and repeatedly fails to repair mismatches  
""to feel helpless. This infant eventually gives up  
pting to repair the mismatches and increasingly  
. 5 his coping behavior on self-regulation in order  
trol the negative emotion generated. He  
..es a'pattern of coping that limits engagement  
: social environment and establishes a negative  
"core. Ironically, when this infant utilizes these  
. viors in potentially normal interactions they  
interactions as well, engendering a cycle  
s his inwardly focused style of coping, a

.'JDClly eventually become pathological.

Coping behaviors of the infant

what coping behaviors does the infant have? Gianino,

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following Brazelton and Beebe, has described six coping behaviors utilized by infants (See Table 1). First the infant can signal his partner with his emotional displays

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and other behaviors to correct the mismatch. For example, frowns communicate the infant's dissatisfaction with the interaction and convey the message "change what you are doing." If signalling does not work, the infant can focus on himself, that is selfcomfort, and buffer himself from the interactive stress. The infant can also focus on objects. If these do not work, the infant can attempt to disengage from the interactive stress by withdrawing, averting or even trying to escape.

These strategies are crucially different from one another. When the infant utilizes his emotional signalling skills he preserves his goal of maintaining social engagement. When he switches to objects he gives up that goal. And when the infant utilizes any of the other coping strategies he sacrifices social engagement and even engagement with objects in order to maintain internal emotional regulation. Thus self-regulation and interactive regulation are two sides of one regulatory process.

To demonstrate the infant's repertoire of coping behaviors we presented infants in our study with an unresolvable mismatch: the challenge of the stillfaced mother. In the still face manipulation, the mother is in

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the normal face-to-face position with her infant, but she remains expressionless and unresponsive. It is as if the mother is saying hello and good-bye at the same time, leaving the infant trapped between the two messages. In early work with T. Berry Brazelton we had described a pattern of eliciting, but we had seen other coping

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patterns as well. In this study we wanted to document these other coping patterns and to evaluate if these infants evidenced stable individual differences in coping.

In fact, our videotapes of infants and their still-faced mothers amply illustrated the variety of coping behaviors these babies used to attempt repair of the mismatch of the still-face. Some infants would repeatedly engage in positive elicits with smiles and vocalization. Other infants utilized negative elicits. Some mixed the two together. Other infants looked over at the mother and turned toward objects and did not look at the mother again. And some displayed stress and ragged breathing and fingering but were unable to elicit or turn toward objects, but only self-comfort and stare into space.

Individual differences and stability in coping behavior

To examine whether or not there were individual differences, or stability in coping behaviors, Gianino, Plimpton and Tronick had 52 6-month-olds confront their mothers engaging in the still-face on two occasions 10 days apart. They found strong and consistent evidence for stability in infant coping styles. Infants demonstrated stability in utilizing signalling, self-comforting and focusing on objects (See Table 2). In fact they even demonstrated stability for the type of signals and type of self-comforting they employed.

These results are intriguing because they suggest that preferential orientations towards others, the self, and the world of things may already be in place by 6 months of age. As hypothesized by generations of psychodynamic therapists, these orientations may potentially

be predictive of certain patterns of personality development and defensive patterns. But our observations occurred during experimentally produced stress. Could we see the same type of coping behavior in the normal interaction?

Infant coping with normal interactive stress

Normal interactive stress arises from many causes

mistiming of emotional signals, unclear signals, misread

ing of signals, differences in goals, overloading or underloading of stimulation. More simply put, these stresses occur because it is impossible for mother or infant to maintain mutual regulation over the course of an entire interaction. These stresses are normal, typical, and inherent to an interaction.

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In one sequence we observed, for example, an infant

was looking at her chair and comforting herself by sucking her finger. The mother attempted to elicit her attention but the infant avoided her by looking first to one side, then the other. The mother then removed the baby's hand from her mouth. The mother moved back slightly, they established eye contact, and both smiled. In another segment, we saw a mother establish eye contact with the infant, who averted, however, as the mother moved in closer. When the mother decreased some of her activity, the infant smiled, but when the mother moved in closer, the infant averted again.

Data analysis of these tapes of infants attempting to repair normally occurring mismatches demonstrated that when infants were confronted by a mismatch, 34% of these mismatches were repaired to a matching state by the next step in the interaction and 36% of the remaining mismatches were repaired by the second step. In other words, normal infants and their mothers are constantly moving into mismatch states and are then successfully repairing them. Furthermore, we found evidence that the infant's experience in repairing normal interactive mismatches was strongly related to the coping behaviors that baby employed when confronted by the more extreme interactive stress of the mother in still-face. Using a scale developed in our laboratory by Ricks, we found that infants whose mothers were more responsive to their signals during the normal interaction were more likely to signal their mothers during the stillface, less likely to evidence distress and less likely to engage in "scanning," a sign of disorganization. Similarly, in a preliminary analysis of a small number of subjects we found that infants who experienced more repairs of mismatched states during the normal interaction were more likely to positively signal their mother and significantly less likely to utilize negative signals during the still face.

Coping styles reflecting failure: infants of depressed mothers

If the kinds of coping behaviors we observed are beginning to stabilize by 6 months of age and if infants' experiences in the normal interaction are related to how they cope with stress, we would expect that infants who experience unrepaired mismatches on a constant basis would begin to stabilize coping styles that reflect that failure. In particular they would become increasingly withdrawn and sad in their affect; they would resort to coping strategies that focused on self, regulation, and they would give up attempts to repairer

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the interaction.

The work of Greenspan, Field, Clark, Zahn-waxler i and others suggested that maternal depression would ' present the infant with such a stress. But before we studied real depression we developed an experimental manipulation with Jeff Cohn in which mothers simulated depression. We asked mothers to flatten their facial expression, talk in a monotone, move slowly and sit away from the infant-to act the way they do on the days they feel blue. (Normal mothers had no trouble following these instructions.) We saw this manipulation as more stressful than the still-face, because though many of the mother's actions in the simulation are , contingent on the infant's actions, they are inappropriate and produce repeated mismatches.

In one sequence, for example, an infant has slumped in his chair and turned away from his mother. He did glance at her several times, but even when she straightened him up he slumped away from her on the other side and eventually fussed and cried.

Our next step was to carry out a naturalistic study of 7-month-old infants whose mothers evidenced depressive symptoms and other signs of disturbance. This was " done with Jeff Cohn, Karlon Lyons-Ruth and Dave Connell. Findings from our preliminary analyses were

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accumulated and eventually interr\_\_ized experiences of the infant over time. When the coping functions well, the infant is able simultaneously to maintain self-and interactive regulation; when these twin achievements are not possible, self-regulation becomes the predominant goal.

Psychopathology may be an outcome of repeated unsuccessful efforts to repair mismatches. We have hypothesized that defensive behaviors can evolve out of the infant's attempts to cope with a history of chronic mismatches in his primary social relationships. The infant's interactive experience, constrained by possible temperamental qualities such as the orientations toward object engagement, people or self-comforting that we uncovered, teaches the infant which coping behaviors are most effective in regulating his distress. But the transition from coping to defense occurs when the infant begins to employ his coping behaviors automatically, inflexibly and indiscriminantly. Behaviors become defensive because they are adopted to preclude the experience of interactive stress-that is, to preclude the anxiety generated by the infant's interactive history. Such behaviors are unrelated to the infant's actual and current interactive situation. They are deployed even when they restrict his immediate and longer term options; even if they curtail his autonomy. The infant seems to need to self-regulate his affective state whatever the cost.

This view does not require that the infant be able to



make a distinction between self and other in order to repair mismatches. In fact, it may be advantageous to an infant with a sensitive partner not to make the distinction, and instead to believe that all changes emanate from himself, since the resulting well-regulated interaction will further his sense of effectance. On the other hand, the inability to distinguish between self and other can be disadvantageous—indeed, deleterious when the interactive partner is insensitive. In these circumstances, the infant's inability to discriminate the actual source of his distress will teach him that he is incapable of exerting any control over the social realm.

If we are to use these concepts and observations for assessment, attempting to predict future problems in a mother-infant relationship, we need to see synchrony or reciprocity or matching as the outcome of an active process of infant and mother coping. While its achievement marks the success of that process, it is the process of interactive mutual regulation, the process of coping and repairing mismatches, that is critical to the infant's development. We should expect to see dissynchrony in the normal interaction. We should also expect to see infant and mother persistently deploying coping behaviors to repair their mismatches and sometimes achieving success.

Following an examination of normal interaction, an assessment might also include a look at the infant coping with the mother still-faced. Like Ainsworth's strange situation, this experience is an age appropriate stress. It is our belief that the infant's reaction to the still-face reveals his expectations, based on the interaction's

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similar to what we saw in the simulated depression study except that these infants looked much more distressed and disengaged than did the infants in the simulated situation. We found that:

- During face-to-face play the depressed mothers engage in positive social play less than 10% of the observation time and they look away from their infants 20% of the time. Normal mothers engage in play about 40% of the time and, as Stern has shown, almost never look away.
- Infants of depressed mothers were only in social play about 5% of the time, whereas infants of normal mothers were in play about 13% of the time. We also observed a marked decrease in the percentage of time the infants of depressed mothers are able to focus on objects. In normal interactions, the 6 month old infant spends about 41% of the time looking at objects but infants of depressed mothers look at objects only 20% of the time. Not only, then, has prolonged exposure to this distortion of maternal behavior disturbed these infants' capacity to play, but it has even disrupted their

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engagement with the inanimate environment.

- Most importantly, just as we found in the normal interactions, there was a strong relation between what the mother did and what the infant did: mothers who were more emotionally positive, even minimally so, had infants who were more positive-the correlation of maternal play and infant play was .51. Mothers who engaged in more intrusive behaviors, such as expressions of anger, had infants who looked away more-the correlation of maternal intrusiveness and infant avert was .54. Mothers who averted from their infants had infants who were more likely to protest-the correlation was .87.

## Summary and discussion

Normal infants, in normal interactions with adults, experience a large number of mismatches in the interaction. Infants have coping behaviors for repairing the interactive mismatches and maintaining self-regulation, coping behaviors which are in large part successful and which begin to stabilize at around 6 months of age. Most importantly, the normal infant's use of coping behaviors is related to his experience in repairing mismatches in the normal interaction. When infants experience atypical interaction or unresolvable mismatches, as in the case of maternal depression, they decrease their deployment of coping skills aimed at repairing the interaction or even at maintaining engagement with the inanimate environment. More and more babies deploy coping behaviors aimed at maintaining self-regulation.

From this' perspective, the pathways to normalcy or psychopathology appear as part of the same developmental process. The central event of the process is the mismatch. The critical developmental experience has to do with whether or not the infant's coping behaviors successfully repair the mismatch and maintain or fail to maintain self-regulation. We see no single traumatic juncture separating these pathways-only the slowing

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history and his affective core, and may predict to the future. For us, seeing fusses, protests, and averts during the stiff-face is a sign that the infant has an expectancy of a normally regulated interaction which is being violated. Indeed, we initially give a similar interpretation to much of the negative behaviors we see in normal interactions. We then look at the infant's reaction to the still-face to see if he is telling us by his reaction to this stress that his usual interactive experience is appropriate.

We have so far focused on the mother as the disorganizing agent in the interaction. But she is not the only agent and may be not even the primary agent of disorganization. An infant is immature, has limited regulatory capacities, is slow to process and slow to respond. He is a difficult interactive partner. Much

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disorganization comes from the infant, but once disorganization starts to stabilize it no longer matters who was the initial cause. Both partners become complicit in maintaining the disorganization.

How can one intervene to undo this disorganization? It may be useful to provide infant and mother each with opportunities for satisfying interactive experiences with other partners. It is expected that these experiences will allow them to develop new interactive patterns that can then be brought into their own interaction. However, disorganization of an interaction, while a sign of a possible problem, may not require immediate intervention. Holding back but still "holding" the dyad may allow adult and infant the opportunity to experience the positive benefits of reparation. Such a strategy should also convey confidence in their capacities to cope; we believe that the dyad itself generates a more stable

,,. organization than the organization that occurs when we cut the reparation process short.

One more finding may help to focus us on this process and suggest new areas of exploration. In our study of Amherst mothers and their infants we found that a 6 and 9 months of age, mother-daughter pairs were much more likely to be in match states than were mother-son pairs. This finding raises questions about the differential development of a sense of effectance, empathy and coping skills in girls and boys. However, it serves to emphasize the potential centrality of the mismatch and its resolution as part of a normal developmental process.

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So Sad You'd Think the World Was  
About to End: Perceptions of and  
Adaptations to Suffering in Three  
Preschool Siblings

by James M. Herzog, M.D.  
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Every evening at around eleven, Jack gets up from his bed. He cries a few unintelligible sounds and heads for the window. His parents say that this behavior is like clockwork. His younger sister, Kerry is like a whirling dervish. Her mother says Kerry is tough, nasty, and at 23 months of age the most difficult of her three children. Robby, who at 43 months is the oldest of the family's children, clings to his father. He literally will not let go except to clobber Jack, who is 33 months of age.

At the Clinic for the Development of Young Children and Parents we are asked to evaluate and assist this young family. The referring social worker tells us that the father, who is 24, has a hereditary cardiac condition. He has already suffered several heart attacks and is a virtual cripple. He cannot work. Moreover, the family has been reported for child abuse and our evaluation is to be a part of the social service agency's assessment of this question. Interestingly, the initial referral makes no mention of the mother. The family's first appointment is almost canceled. Jack has not awakened for two nights in a row. The problem has been solved, we are told. Tactfully, we suggest that it might be useful for us to meet anyway. Twenty-yearold Mrs. T. agrees and adds that maybe we can help her, too. Her mother insists that she is retarded. Can we give her some tests? Then she'll show her mother a thing or two.

This article will present our understanding of the T. children, Jack, Kerry, and Robby, as it developed during our evaluation. All the children were directly and profoundly affected by their father's illness and threatened

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