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## THE CHANCES FOR CHILDREN TEEN PARENT–INFANT PROJECT: RESULTS OF A PILOT INTERVENTION FOR TEEN MOTHERS AND THEIR INFANTS IN INNER CITY HIGH SCHOOLS

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**ABSTRACT:** Adolescent motherhood poses serious challenges to mothers, to infants, and ultimately to society, particularly if the teen mother is part of a minority population living in an urban environment. This study examines the effects of a treatment intervention targeting low-income, high-risk teen mothers and their infants in the context of public high schools where daycare is available onsite. Our findings confirm the initial hypothesis that mothers who received intervention would improve their interactions with their infants in the areas of responsiveness, affective availability, and directiveness. In addition, infants in the treatment group were found to increase their interest in mother, respond more positively to physical contact, and improve their general emotional tone, which the comparison infants did not. Importantly, these findings remain even within the subset of mothers who scored above the clinical cutoff for depression on the *Center for Epidemiological Studies-Depression Scale* (CES-D; L. Radloff, 1977), confirming that it is possible to improve mother–infant interaction without altering the mother’s underlying depression. The implications of these findings are significant both because it is more difficult and requires more time to alter maternal depression than maternal behavior and because maternal depression has been found to have such devastating effects on infants.

**RESUMEN:** La maternidad adolescente presenta serios retos a las madres, a los infantes y en última instancia a la sociedad, particularmente si la madre adolescente forma parte de una población minoritaria que vive en un ambiente urbano. Este estudio examina los efectos de un tratamiento de intervención enfocado en madres adolescentes de bajos recursos económicos y de alto riesgo, y sus infantes, dentro del contexto de las escuelas secundarias públicas donde hay facilidades de cuidado infantil disponibles en el mismo lugar. Nuestros resultados confirman la hipótesis inicial de que las madres que reciben intervención mejorarían las interacciones con sus infantes en cuanto a la actitud de responder, la disponibilidad de la afectividad y la forma de dar órdenes. Adicionalmente, se encontró que los infantes en el grupo de

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tratamiento incrementaron su interés en la madre, respondieron más positivamente al contacto físico y mejoraron su tono emocional general, lo cual no sucedió con los infantes del grupo de comparación. De manera importante, estos resultados se dieron aún dentro del subgrupo de madres cuyos puntajes estaban por encima de la línea divisoria de la depresión en CES-D, confirmando así que es posible mejorar la interacción madre-infante sin alterar la fundamental depresión de la madre. Las implicaciones de estos resultados son significativas por dos razones, primero porque es más difícil y requiere más tiempo alterar la depresión maternal que la conducta maternal, y también porque se sabe que la depresión maternal tiene efectos muy devastadores sobre los infantes.

**RÉSUMÉ:** La maternité adolescente présente de sérieux défis aux mères, aux nourrissons et enfin à la société, particulièrement si la mère adolescente fait partie d'une population minoritaire dans un milieu urbain. Cette étude examine les effets d'une intervention traitement visant des mères adolescentes à haut risque, de milieu pauvre, et leurs nourrissons dans le contexte de lycées publics dans lesquels des crèches existent sur place. Nos résultats confirment l'hypothèse initiale selon laquelle les mères recevant une intervention amélioreraient leurs interactions avec leurs nourrissons dans les domaines de la réactivité, la disponibilité et la directive affective. De plus, on a établi que les nourrissons du groupe de traitement ont un intérêt plus élevé pour leur mère, répondent plus positivement au contact physique et améliorent leur ton émotionnel général, ce qui n'était pas le cas pour le groupe de comparaison. Il est important de constater que ces résultats demeurent stables même au sein du sous-groupe de mères étant juste au dessus de la limite clinique pour la dépression sur la CES-D, ce qui confirme qu'il est possible d'améliorer l'interaction mère-nourrisson sans altérer la dépression sous-jacente de la mère. Les implications de ces résultats sont importantes, à la fois parce qu'il est plus difficile et lent d'altérer la dépression maternelle que le comportement maternel et parce que l'on sait que la dépression maternelle a des effets si dévastateurs sur les nourrissons.

**ZUSAMMENFASSUNG:** Jugendlichenschwangerschaft stellt eine große Herausforderung für die Mütter, ihre Kinder und letztlich für die Gesellschaft dar, insbesondere, wenn die jugendlichen Mütter Angehörige einer Minderheit sind, die in einem städtischen Umfeld leben. Diese Studie untersucht die Effekte einer Behandlungsintervention, die sich an arme, jugendliche Mütter und deren Kinder mit hohem Risiko in einer weiterführenden Schule wendet, bei der eine Tageskinderstätte in der Schule vorhanden ist. Unsere Ergebnisse bestätigen die anfängliche Hypothese, dass die Mütter, die eine Behandlung erfuhren, ihre Interaktion mit dem Kind im Bereich der emotionalen Schwingungsfähigkeit, der Verfügbarkeit und der Klarheit der Anordnungen verbesserten. Zusätzlich fanden wir, dass die Kinder in der Behandlungsgruppe ihr Interesse an den Müttern erhöhten, besser auf körperlichen Kontakt reagierten und ihre Grundstimmung verbesserten, was die Vergleichskinder nicht zeigten. Bedeutenderweise stimmte das auch für jene Mütter, die in einem Depressionsfragebogen deutlich depressiv waren, was darauf hinweist, dass es möglich ist die Mutter-Kind Interaktion zu verbessern, ohne die zugrundeliegende Depression zu behandeln. Die Bedeutung dieser Ergebnisse ist groß, sowohl weil es schwieriger ist und mehr Einsatz braucht, um die mütterliche Depression zu bessern, als auch, weil gezeigt werden konnte, dass mütterliche Depression einen vernichtenden Effekt auf Kleinkinder hat.

抄録：青年期に母親になることは、母親に、乳児に、そして究極的には社会に重大な課題を突きつける。十代の母親が都会の環境に住む少数民族に属している場合は特にそうである。この研究は、低所得で高リスクの十代の母親と乳児を対象とした治療的介入の効果を、学校で保育が利用可能な公立高校のコンテキストで、検証する。われわれの結果から、介入を受

けた母親は、応答性、情緒応答性、および指示性 *directiveness* の領域で乳児との相互交流が改善するだろうという初期仮説が、確認された。さらに、治療群の乳児は母親への関心が増加し、身体的な接触により肯定的に応答し、そして全般的な情緒のトーンが改善したことがわかった。これらは対照群の乳児には見られなかった。重要なことに、CES-D でうつ病の臨床的カットオフ点以上の得点がある母親という部分集団でさえも、これらの結果はそのままであり、母親の基礎にある抑うつを変えること無しに、母親と乳児の相互交流を改善できる可能性が、確認される。これらの所見の持つ意義は、次の二つの理由で重要である。なぜなら母親の抑うつを変えるのは、母親の行動を変えるよりもより難しく、より多くの時間がかかるから、そしてなぜなら母親の抑うつは乳児に対してかくも破壊的な影響を持つからである。

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Adolescent motherhood poses serious challenges to mothers, to infants, and ultimately to society. A baby is born to a teenage mother every 21 minutes according to the Children's Defense Fund (1998). Many negative conditions surround pregnant adolescents, including lack of adequate prenatal care, poor nutrition, inadequate living conditions, lack of support from the baby's father, and negative responses from the teen's family (Osofsky, Hann, & Peebles, 1993). These conditions put the mental health and socioemotional development of both the adolescent mother and her infant at risk (Brooks-Gunn & Furstenberg, 1986), particularly if the teen mother is part of a minority population living in an urban environment. A comprehensive report on mental health and its treatment in ethnic and racial minority populations issued in 2001 by the Surgeon General of the United States called the lack of adequate mental health care for minority populations a "critical public health concern" (U.S. Department of Health and Human Services, 2001). He underscored lack of research on racial and ethnic minority mental health, less access to treatment, reduced availability of care, poorer quality of service, delay in seeking treatment, more frequent errors in diagnosis among minority populations, and higher rates of anxiety and depressive symptoms (U.S. Public Health Service, 2001). Thus, a mental health intervention program that would reach adolescent mothers and their babies could play a vital role in the prevention of negative cycles of repeated pregnancies, compromised attachments, and poor mental health outcomes in this population. The *Chances for Children* Teen-Parent Infant Project was created to address some of these concerns by intervening early in the lives of high-risk adolescent mothers and their children. This study examines the effects of the treatment intervention.

### PROJECT DESCRIPTION

The *Chances for Children* Teen Parent-Infant Project is located in high schools where daycare is provided to parenting teens by the LYFE (Living for Young Families Through Education)

program of the New York City Department of Education. LYFE operates nurseries onsite in the buildings where teen mothers attend classes. A collaboration between the New York City Department of Education and the Institute for Child, Adolescent, and Family Studies (ICAFS), a nonprofit psychodynamic training institute for mental health professionals, made onsite intervention possible. The purpose of the project is to expand the childcare services provided to the participating mothers and infants to include dyadic, individual, and group interventions that will strengthen the relationships between teen mothers and their infants, to provide education and coping skills for these young mothers, and to prevent destructive interactions from interfering with the healthy development of both the teen mother and her infant. As we created the intervention for this project, it was important to consider the unique situations of the adolescent mother and her child and, in particular, the effects of depression and parenting stress on these vulnerable dyads.

### **THE ADOLESCENT MOTHER**

For many typically developing teenagers in America, adolescence is a time for moving away from the family towards more independent functioning. It encompasses new identifications and wider intimacies, significant cognitive development, and rapid changes in physical, social, emotional, and psychological functioning. Intensely egocentric, adolescents are trying out different roles that will eventually develop into more consolidated identities. Pregnancy radically alters this developmental trajectory, requiring the teen to forsake her own path for that of motherhood (Mayers & Siegler, 2004). Rather than becoming less dependent on her family, she frequently becomes more dependent. Family conflict may intensify along with economic pressure. As the adolescent struggles with her own conflicted identity, empathy, respect, and sensitivity to the infant may be lost. Fantasies of the baby may not be congruent with experiences of the real baby and may result in confusion, disappointment, depression, and rage for the mother. The consequent spiraling negative interactions can contaminate the development of both the infant and the parent–infant relationship, decreasing chances of reparation. With this in mind, it is not surprising that studies examining the effects of adolescent parenting have found adolescents to be less verbally expressive and sensitive to the infant, to express less positive and more negative affect, and to endorse punitive child-rearing attitudes more frequently (Culp, Applebaum, Osofsky, & Levy, 1988; Osofsky et al., 1993; Hann, Osofsky, Barnard & Leonard, 1994).

### **THE INFANT OF THE ADOLESCENT MOTHER: OUTCOMES**

Though outcome studies of teen parenting have frequently failed to separate effects of social and economic disadvantage from parenting by an adolescent, per se (Brooks-Gunn & Furstenberg, 1986), results of a study by Hann, Osofsky, and Culp (1996) that related adolescent mother–child relationships to preschool outcomes indicated that the cognitive-linguistic development of children of adolescent mothers was affected both by mother–child relations and the cumulative index of demographic risk. Using assessments from different points in time, in different settings, and by different observers, the caregiving practices of low-income teen mothers were found to predict the child’s language ability at 30 months. Similarly, Kelly, Morisset, Barnard, Hammond, and Booth (1996) studied the influence of early mother–child interaction on preschool cognitive-linguistic outcomes in a high-risk social group (mean age = 22.31 years) and found that the

quality of mother–infant interaction was a significant predictor of preschool cognitive and linguistic outcomes regardless of the mother’s IQ.

### THE DYAD IN THE ADOLESCENT MOTHER–INFANT PAIR: DEPRESSION

The dyad formed by the adolescent mother and her infant must be able to sustain many challenges: the mother’s developmental stage, a hostile environment created by an unexpected, often unwanted, pregnancy or a forbidden abortion, conflicted social relations within the teen’s own family or between the teen and her baby’s father and/or his family, and crumbling social and economic supports (Osofsky et al., 1993). In addition, the teen mother may deny her pregnancy, resulting in the absence of adequate prenatal care, and the psychic connection may be compromised by lack of prenatal imagining (Stern, 1995). Further, adolescent mothers are especially likely to be depressed.

Adolescent mothers are reported to display more instances of depression than are mothers generally (Osofsky et al., 1993), who in turn are reported to show more depression than are women generally (Hart, Field, & Roitifarb, 1999). There is prodigious research on depressed mothers and their infants, confirming that interactions between depressed mothers and their infants are significantly more negative than those in a nondepressed population (Cohn, Campbell, Matias, & Hopkins, 1990; Dodge, 1990; Field et al., 1985). Further, maternal depression has been found to have devastating effects on infants (Abrams, Field, Scafidi, & Prodromidis, 1995; Field, 1998; Lundy, Field, & Pickens, 1996; Lyons-Ruth, Connell, Grunebaum, & Botein, 1990; Murray, Fiori-Cowley, Hooper, & Cooper, 1996). Field (1998) suggested that as early as birth, infants of depressed mothers show a profile of “dysregulation” in behavior, physiology, and biochemistry. Abrams et al. (1995) reported that as early as 24 hours after birth, infants of depressed mothers were found to demonstrate poorer orienting performance, more irritability, and less motor tone, robustness, and endurance during physical examination than were babies of nondepressed mothers. Infants may then carry a “depressed style” of behaving into interactions with nondepressed adults (Field et al., 1988). In addition to these issues, because relationships are coconstructed (Beebe, 2000), dyads that include a depressed mother are at risk for mutually reinforcing problematic interactions, as illustrated by Whiffen and Gottlieb (1989). In this report, depressed mothers whose infants exhibited inconsolable, fussy patterns of behavior became more depressed and in turn rated their children more bothersome and difficult to care for than did a comparison group.

Infant attachment relationships also appear to be sensitive to maternal depression. In an intervention study of depressed mothers on welfare and a control population, Lyons-Ruth et al. (1990) reported that 62% of the infants of chronically depressed, low-income mothers whose families received no intervention services were classified as disorganized (Cassidy & Shaver, 1999). Clinically depressed mothers, who engage in more intrusive/hostile and detached/unresponsive styles of caregiving, are more likely to raise insecurely attached infants (Simpson, 1999). Further, attachment styles appear to be sensitive to different manifestations of maternal depression. At 1 year, irritable-stressed mothers and infants evidenced a type of insecure attachment that differed from that of infants with slowed-down depressed mothers (Rosenblum, Mazet, & Benony, 1997). This suggests that interventions need to be tailored to the types of depression evidenced in the mother. Indeed, Malphurs, Field, and Larrain (1996) found that interactive coaching specific to the profile of the depressed mother significantly improved interactions with infants in a low socioeconomic status teenage population.

For these reasons, we theorized that it would be particularly important to alter mother–infant interactions in a population of teen mothers, where the incidence of depression is so large. Further, we speculated that it would be faster and easier to alter behavior than underlying mood, and thus wanted to confirm that indeed behavior could be altered even in cases where the underlying depression did not change.

### RESILIENCE FACTORS

A number of important resilience factors informed our interventions because though many adolescent parents live in conditions of chronic stress, with few economic, social, familial, or educational supports, some teenagers can manage even under these adverse conditions. Osofsky et al. (1993) reported on some of the protective factors that appear to increase resilience in this population. These factors include strong social supports, both general and specific, the ability to continue to pursue educational goals, a stable relationship with the infant's father, high self-esteem, good problem-solving skills, and an infant with an easy temperament who can draw positive attention from its environment. Positive correlations between external supports from the community and positive parenting behavior and attachment security in samples of high-risk infants have been reported by Crnic, Greenberg, and Slough (1986), and indicate that both parent and child may benefit from supportive interactive treatments.

### INTERVENTION

In designing the intervention for our program, we considered different models of infant–parent treatment. During the past 25 years, infant mental health specialists have developed numerous strategies for intervention targeted toward parents, infants, and their interactions. (For a wide-ranging review of programs, service-delivery models, conceptual frameworks, and empirical summaries in the United States, see Meisels & Shonkoff, 2000.) Comparison studies designed to look at outcomes of these various techniques are described by Daniel Stern in his book *The Motherhood Constellation* (1995). Despite differences among the interventions, Stern reported that the nonspecific therapeutic effects common to all treatments are found to be more important than are particular therapeutic effects specific to any one treatment. He identified three critical commonalities among treatments: the use of a positive therapeutic alliance, a positive transference that remains in place at the end of treatment, and a positive therapeutic regard that focuses on the positive aspects of parenting rather than on deficits or pathologies. Stern argued that this unusual therapeutic stance addresses a fear specific to the developmental stage of early motherhood: the fear of being found inadequate as a mother, of being judged unable to keep the baby alive, healthy, and sane.

## THE CHANCES FOR CHILDREN PROJECT: STRUCTURE AND OUTCOME RESEARCH

### *Structure*

The *Chances for Children* Teen Parent–Infant Project provides a tripartite intervention that includes individual, dyadic, and play therapies, support/parenting groups, and support for the nursery staff. In particular, we use three approaches in our work: (a) a psychodynamic psychotherapy approach based on the theories of Fraiberg (1987a, 1987b) and Lieberman & Pawl

(1993) that links the past to the present and begins to banish some of the ghosts that lurk in the nurseries, (b) a strength-based videotape analysis derived from the work of McDonough (2000) and modified by techniques utilized by Beebe (2003) and Downing (2003), and (c) interventions derived from mentalized based treatments conceptualized by Fonagy, Gergely, Jurist, and Target (2002). Parenting groups are structured using the Partners in Parenting Education (PIPE) curriculum (Butterfield, Dolezal, Knox, & Pagano, 1998), a manualized, relationship-based treatment designed specifically for teen-aged parents. In addition, all interventions—whether group, dyadic, or individual—are targeted to increase reflection over reaction, to insert thought into habitually impulsive behaviors.

The specific treatment of each mother–infant pair is selected on the basis of individual clinical assessments of need. Within the individual forms of treatment, we conceptualized three different approaches for different mothers: (a) an *education and developmental guidance model* for new mothers who, though young, had received “good-enough” parenting themselves and were committed mothers with positive support; (b) a *supportive treatment model* for mothers who struggled with developmentally delayed children or whose families were overinvolved providing a kind of paradoxical support that was undermining and disparaging to the new mother–infant pair; and (c) an intensive *infant–parent psychotherapy model* for mothers whose own histories were riddled with abuse, abandonment, illness, and lack of support. In dyads where maternal depression was present, interventions were tailored to take into account differences between irritable/intrusive behaviors and withdrawn behaviors.

Within the 52 treatment dyads, approximately one third received each of the three models; 11 children received individual play therapy in addition to dyadic treatment. Regardless of model, all mothers received at least five dyadic sessions and attended the parenting/support groups. Frequent unscheduled moments of intervention/interaction occurred at drop off and pick up times in the nurseries and between classes or after school. The length of time a particular dyad spent in the program was determined by the mothers’ academic situation and ranged from approximately 6 months to approximately 20 months (i.e., through 2 academic years). Each year was treated independently, and each dyad was measured at the beginning and end of each year. Students who had a shorter period of time in the program received more frequent services.

### **Outcome Research**

The *Chances for Children* Teen Parent–Infant Project is primarily a clinical program, not a research program. It is funded by private foundations and includes research components to evaluate the effectiveness of our interventions.

The following hypotheses were explored:

**H1:** Mothers in the treatment schools would show improved maternal behavior as measured by the Maternal Behavior Rating Scale in the areas of responsiveness, affect availability, and directiveness at the end of the program.

**H2:** Treatment infants would become more optimally responsive emotionally and physically to their mothers.

**H3:** Mothers who evidenced depression on the *Center for Epidemiological Studies-Depression Scale* (CES-D; Radloff, 1977) would nevertheless show greater responsiveness, affect availability, and less directiveness toward their children after intervention.

**H4:** At the end of the program, treatment mothers would report experiencing less parenting-related stress compared to the comparison mothers as measured by the Parenting Stress Index.

**H5:** Mothers' perception of their infants' temperament, as measured by the *Infant Characteristics Questionnaire* (ICQ; Bates, Freeland, & Lounsbury, 1979), would not differ between treatment and comparison mothers.

## METHOD

### *Participants*

*Recruitment.* Eighty-five mother–infant dyads were recruited from seven inner city high schools. Three high schools housed the project, and these students ( $n = 52$ ) constituted the treatment group. Students ( $n = 33$ ) from the remaining four schools constituted the comparison group. All students with babies in the LYFE nurseries were recruited, but only the students who returned videotape releases and who remained in the school for at least one full semester were analyzed in the study. Generally, most teens who were approached agreed to participate in the program, with the exception of several teens living in foster care whose guardians did not sign releases for their participation. All mothers were full-time students and were studying for high-school diplomas or GEDs. Among the students who remained in school, none dropped out of the project, per se; however, in both years, there were students who moved, transferred schools, or completed GEDs and did not complete the program.

*Demographic Description.* Mothers' mean age was 17 years (range = 12–22), and the babies' mean age was 11 months (range = 2–34). Sixty-three percent of the mothers were African-American, and 37% were Hispanic. Of the 85 infants, 42 were female.

*Procedure.* All students in treatment schools were videotaped in a 10-minute free-play session at the beginning of their participation in the program as well as at the end. In addition, the mothers were given three self-report questionnaires (CES-D, *Parenting Stress Index Short Form* (PSI; Abidin, 1995), and ICQ; discussed later) in the beginning of their participation, two of which were readministered at the end (CES-D and PSI). They completed these questionnaires at the same time as the videotaping. The mothers in the comparison schools were videotaped at the beginning of the school year and again at the end, during which time they filled out the same self-report questionnaires (see Table 1).

In the treatment schools, the mothers filled out the questionnaires at a regular lunch-group meeting. In the comparison schools, the mothers were gathered for a luncheon, at which time they filled out the questionnaires. All students were offered incentives (i.e., toys for their children and McDonald's gift certificates) and the videotape of themselves with their children in return for their participation.

### *Measures*

*Assessment of maternal behavior.* Ten-minute videotapes of mother–infant dyads in a free-play interaction were analyzed for maternal behavior and coded according to the Maternal Behavior Rating Scale (MBRS; Mahoney, Finger, & Powell, 1985). The MBRS has 18 items, each scored on a five point scale that derive four factors:

- *Responsive/Child Oriented* assesses the mother's sensitivity to her child's interest, the appropriateness of her responses to her child's behavior, and her ability to engage her child in a reciprocal interaction.

TABLE 1. Schedule of Assessment and Numbers

	Instruments	Treatment group pretreatment	Treatment group posttreatment	Comparison group pretreatment	Comparison group posttreatment
Year 1 (2000–01)	<ul style="list-style-type: none"> <li>• Videotaping</li> <li>• <i>Center for Epidemiological Studies–Depression Scale (CES-D)</i></li> <li>• <i>Parenting Stress Index Short Form</i></li> <li>• <i>Infant Characteristics Questionnaire</i> (only in the fall)</li> </ul>	<p>Mother–infant dyads were recruited throughout the year. Eight dyads joined during the fall semester, and 11 dyads joined in January.</p>	<p>Mother–infant dyads were filmed for a postintervention assessment in May or June. Mothers also filled out the questionnaires again. n = 19</p>	<p>A filming team visited the schools in September/October to film and administer all the instruments. n = 14</p>	<p>A filming team visited the schools in May/June to film and administer the instruments. n = 14</p>
Year 2 (2001–02)	<ul style="list-style-type: none"> <li>• Videotaping</li> <li>• <i>Center for Epidemiological Studies–Depression Scale (CES-D)</i></li> <li>• <i>Parenting Stress Index Short Form</i></li> <li>• <i>Infant Characteristics Questionnaire</i> (only in the fall)</li> </ul>	<p>Mother–infant dyads were recruited throughout the year. Twenty-four dyads joined during the fall semester, and 9 dyads joined in January.</p>	<p>Mother–infant dyads were filmed for a post-intervention assessment in May or June. Mothers also filled out the questionnaires again. n = 33</p>	<p>A filming team visited the schools in September/October to film and administer all the instruments. n = 19</p>	<p>A filming team visited the schools in May/June to film and administer the instruments. n = 19</p>

- *Affect/Animation* assesses the mother’s display of affect in relation to her acceptance and enjoyment of her child, as well as her overall expressiveness, inventiveness, and warmth toward her child.
- *Achievement Orientation* assesses the mother’s encouragement of sensorimotor and cognitive development and quantity of verbal praise she gives her child. This factor, however, has not been found very useful according to the author.
- *Directive* measures the frequency and intensity with which the mother directs her child and her child’s play. It also examines the mother’s pace.

Overall, higher scores demonstrate “better” parenting for all factors except the last (directive), where a lower score is optimal. The MBRS was chosen because it has been used with this type of population and in similar types of research (Mahoney et al., 1985; Mahoney & Wheeden, 1997).

*Assessment of infant behavior.* The same 10-minute videotapes were coded for infant behavior using a 10-item Likert-style infant rating scale constructed by the authors. The first five items were taken from a mother–infant scale created by Zoll, Lyons-Ruth, and Connell (1984) and used in Lyons-Ruth, Connell, Zoll, and Stahl (1987), and the last five items were created for this project (see Appendix 1 for the 10 items). Each item was coded and analyzed independently. The items were chosen because a wide body of research has shown them to be important aspects of infant functioning.

*Coding and interrater reliability.* Coders rated the tapes blind to group status as well as whether a dyad was pre- or posttreatment. No dyad was rated both pre- and posttreatment by the same coder. For the MBRS, there were four coders rating the videotapes, including the two principal investigators, a doctoral-level researcher, and a master’s-level clinician. Reliability coefficients between the researcher and the other coders were computed on 20% of the sample size and were .8 for both years. The coders of the infant scale included the two principal investigators, a doctoral-level researcher, and a doctoral candidate. Reliability coefficients between the researcher and the other coders were computed on 20% of the sample size and ranged from .80 to .97.

*Self-report measures.* The *Parenting Stress Index Short Form* (PSI; Abidin, 1995) was used to assess the degree of parenting stress mothers were experiencing. This measure aims at identifying stressful parent–child systems to be able to provide intervention services that have the potential to reduce behavioral and emotional problems among children. The scale has 36 items asking the mother about her experience of individual and dyadic difficulties. In addition to a Total Stress score, four subscales are derived: Defensive Responding (7 items), Parental Distress (12 items), Parent–Child Dysfunctional Interaction (12 items), and Difficult Child (12 items). Each item is rated on a Likert scale of 1 to 5, producing a score between 12 and 60 for each subscale (except the Defensive Responding subscale, which produces a score between 7 and 35). Higher scores indicate more difficulty on each scale.

The *Center for Epidemiological Studies-Depression Scale* (CES-D; Radloff, 1977) was used to assess the presence of depression and its relation to difficulties in the teen mothers. It is a 20-item measure, widely used in research, assessing depressive symptomatology. The CES-D assesses cognitive, affective, behavioral, and somatic symptoms associated with depression; it measures self-reported present, but nonspecific, distress or “depressive symptoms” rather than

clinically diagnosed depression. A score of 16+ was used to select a depressive-symptom group, at the beginning and at the end of the school year.

The *Infant Characteristics Questionnaire* (ICQ; Bates et al., 1979) was used to assess that infant characteristics did not influence outcome differences between treatment and comparison mothers. This questionnaire was primarily developed to assess the construct of difficult temperament, or at least parents' perception of their children's temperaments. Each item is rated on a Likert scale of 1 to 7. The scale has separate forms for 6-, 13-, and 24-month-old children, with 24, 32, and 32 items, respectively. The 6-month and the 13-month scales derive four factors with possible scores ranging from 21 to 63, and the 24-month scale derives seven factors with scores ranging from 14 to 49. Higher scores on each subscale indicate that a mother perceives more difficulty in that area. The most clear-cut and valid factor is the first on each scale, which is the fussy-difficult. Other factors include unadaptable, dull, and persistent.

All measures were administered to each mother or mother–infant pair both at the beginning of participation and at the end. A few mothers were not willing to answer every question on each instrument, but were still included in the sample for all questions answered.

## RESULTS

### *Demographic and Descriptive Data*

Treatment and comparison groups were compared on demographic variables of maternal age, babies' age, race, babies' gender, duration of breastfeeding, and whom the mother lived with. A two-tailed *t* test for independent samples for age was found to be significant between treatment (mean age = 16.78 years) and comparison mothers (mean age = 18.0 years), such that the treatment group mothers were younger ( $t = -3.801, p = .000$ ). There were no statistically significant differences for any other demographic variables (treatment group vs. comparison group), including average age of child (10.4 vs. 12.6 months, respectively), gender of child (male/female: 50/50 vs. 51.5/48.5%, respectively), maternal race (African-American/Hispanic: 66/34% vs. 57/43%, respectively), and average length of breastfeeding (2 vs. 2.35 months, respectively).

### *Maternal Behavior*

Paired-sample *t* tests were calculated to compare treatment and comparison mothers on their pre- and posttreatment scores of the four factors of the MBRS. The results indicated that for the treatment schools, three of the factors—Responsive/Child Oriented, Affect/Animation, and Directive—showed significant improvement whereas none of the factors improved for the comparison schools. The Achievement Orientation factor also improved for the treatment group, but not significantly (for mean scores, see Table 2). The significance of the results was not reduced when excluding the second-year participation by the six dyads who remained in the program for 2 years.

### *Infant Behavior*

Paired-sample *t* tests were calculated to compare treatment and comparison infants on their pre- and posttreatment scores on the 10 items of the Infant Scale. Results indicated that the infants in the treatment sites improved significantly on “infant's interest in mother” ( $t = -2.52, p = .016$ ),

**TABLE 2.** *Maternal Behavior Rating Scale*

Maternal Behavior Rating Scale Factor	Treatment vs. comparison school	<i>n</i>	<i>M</i>		Paired <i>t</i> test	Two-tailed significance
			Pretreatment	Posttreatment		
Responsive/Child Oriented	Treatment group	52	3.21	4.19	−7.36	.000***
	Comparison group	33	3.27	3.15	.60	.554
Affect/Animation	Treatment group	52	3.07	3.59	−4.74	.000***
	Comparison group	33	2.90	2.85	.34	.737
Achievement Orientation	Treatment group	52	2.04	2.27	−1.60	.116
	Comparison group	33	1.92	2.00	−.45	.656
Directive	Treatment group	52	3.32	2.59	6.68	.000***
	Comparison group	33	2.97	2.80	.78	.442

\*\*\**p* < .001.

“infant’s response to physical contact” ( $t = -2.12, p = .043$ ), and “infant’s general emotional tone” ( $t = -2.85, p = .007$ ). In the comparison sites, infants did not improve significantly on any of the items. In addition, we found that the infants from the comparison schools became significantly more aggressive toward their mothers ( $t = -2.77, p = .011$ ). A comparison between treatment and control depressed and nondepressed mothers revealed no significant differences in the infant measure.

### *Self-Report Instruments*

At the pretest, 38.6% of the total sample scored as depressed (i.e.,  $\geq 16$ ), and at posttest, 36.7% scored as depressed (see Table 3). Both numbers are well above what is expected in the general population. There were no statistically significant differences between the treatment and comparison groups on this measure.

To understand the impact of depression on the treatment program, paired-samples *t* tests were calculated on the four factors of the MBRS pre- and posttreatment scores using only the subgroup of mothers who scored depressed at any time during the year. This analysis revealed

**TABLE 3.** *Depression scores (CES-D 16+)*

		Treatment	Comparison	Total ****
Pretreatment	Depressed	37.3% (19)*	40.6% (13)**	38.6% (32)***
	Normal	62.7% (32)*	59.4% (19)**	61.4% (51)***
Posttreatment	Depressed	34.8% (16)*	39.4% (13)**	36.7% (29)***
	Normal	65.2% (30)*	60.6% (20)**	63.3% (50)***
Both pre- and posttreatment		Depressed	15.4% (8)	21.2% (7)
				17.6% (15)

<sup>a</sup>% and *n* of treatment mothers pre- vs. posttreatment.

<sup>b</sup>% and *n* of comparison mothers pre- vs. posttreatment.

<sup>c</sup>% and *n* of all mothers pre- vs. posttreatment.

<sup>d</sup>At pretreatment, 2 mothers did not complete the CES-D; at posttreatment, 6 mothers did not complete it.

that the mothers who received treatment (and who scored depressed on the CES-D,  $n = 32$ ) significantly improved their scores across the time of treatment on Factors 1, 2, and 4 of the MBRS: Responsive/Child Oriented, Affect/Animation, and Directive ( $t = -4.90, p = .000$ ;  $t = -3.22, p = .003$ ;  $t = 4.67, p = .000$ , respectively). In contrast, the scores of the depressed mothers in the comparison group ( $n = 19$ ) worsened over the same period of time. In fact, on the Factor 1, the control group scores worsened significantly ( $t = 2.29, p = .034$ ).

Thus, an examination of the relationship between the MBRS and depression showed that treatment mothers improved despite depression. Additionally, our analyses indicated that treatment mothers who scored depressed either pre- or posttreatment improved less than did mothers who did not score depressed at either testing time (see Figures 1 and 2). Mothers who scored depressed at both testing times improved the least (see Figure 3).

Note that our data indicated that there was curiously little difference in maternal behavior between depressed and nondepressed mothers at the beginning of the treatment. This may be due to small numbers, but is an issue that needs to be addressed in future research.

The PSI failed to show statistical differences between the treatment and comparison mothers. However, after removing the participants who scored as significant on Defensive Responding (a subscale aimed at identifying mothers answering questions defensively), paired-sample  $t$  tests showed that the treatment group improved significantly on Parent–Child Dysfunctional Interaction. The comparison group improved significantly on Parental Distress, but not on Parent–Child Dysfunctional Interaction (see Table 4 for scores).

The ICQ did not show any differences between treatment and comparison mothers; nor did it show statistical differences between pre- and posttreatment scores. Thus, it appears that mothers maintained their perception of their infants' temperament.

## DISCUSSION

This study examines the effects of a treatment intervention targeting low-income, high-risk teen mothers and their infants in the context of public high schools where daycare is available onsite. Our findings confirm the initial hypothesis that mothers who received intervention would improve their interactions with their infants in the areas of responsiveness, affective availability, and directiveness. In addition, infants in the treatment group were found to increase their interest in mother, respond more positively to physical contact, and improve their general emotional tone, which the comparison infants did not. Further, these findings remain even within the subset of mothers who scored above the clinical cutoff for depression on the CES-D, confirming the third hypothesis that it is possible to improve mother–infant interaction without altering the mother's depression. This is particularly critical in our population, which demonstrates a higher incidence of depression than national norms. This is not surprising given the lack of support, economic stresses, and uncertain living circumstances of many of our participants. That a depressed mother can be taught to interact in such a way that her depression does not compromise her interaction with her child is consistent with both clinical and quantitative reports in the literature (Cohen & Beebe, 2002; Fraiberg, 1987b).

In Fraiberg's (1987b) description of the case of Nina, a severely depressed anorectic teen mother comes to treatment with her failure-to-thrive infant. In the context of treatment, the baby reaches her potential in growth and cognitive motor development while the mother remains seriously depressed and anorectic. From this, Fraiberg (1987b) noted that "Long before the

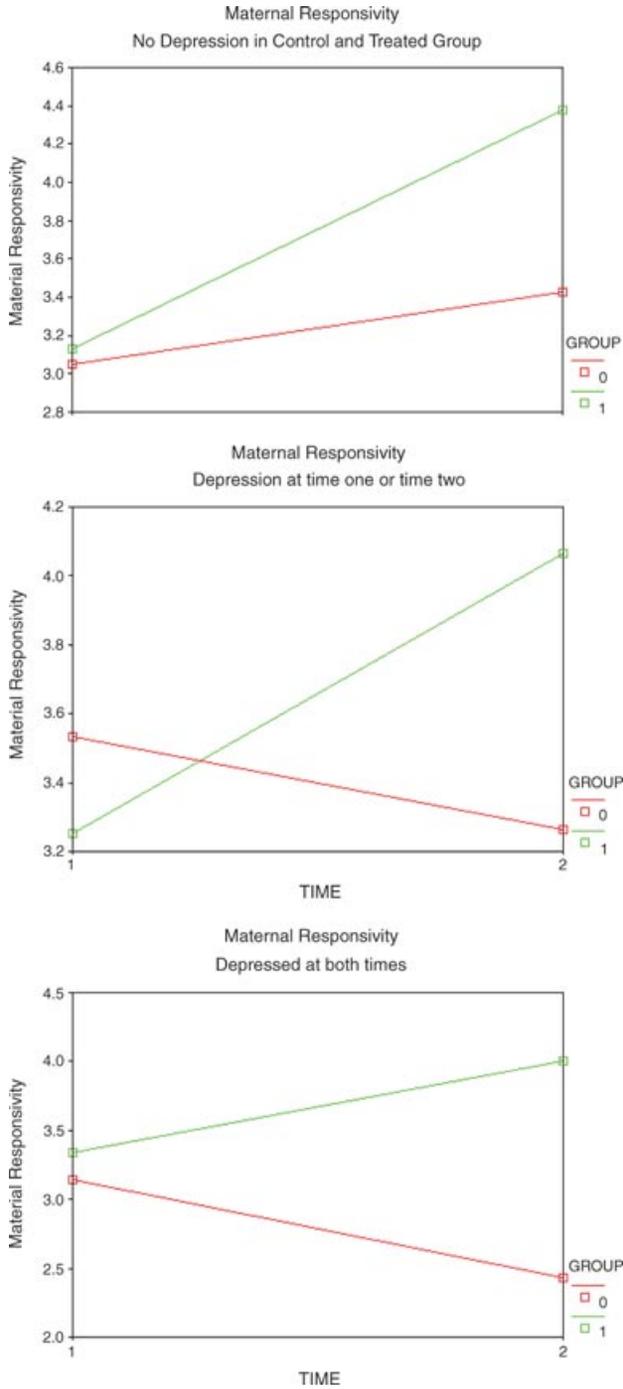


FIGURE 1. MBRS Factor 1 Responsive/Child-Oriented and depression outcome in treatment (1) and control (0) mothers.

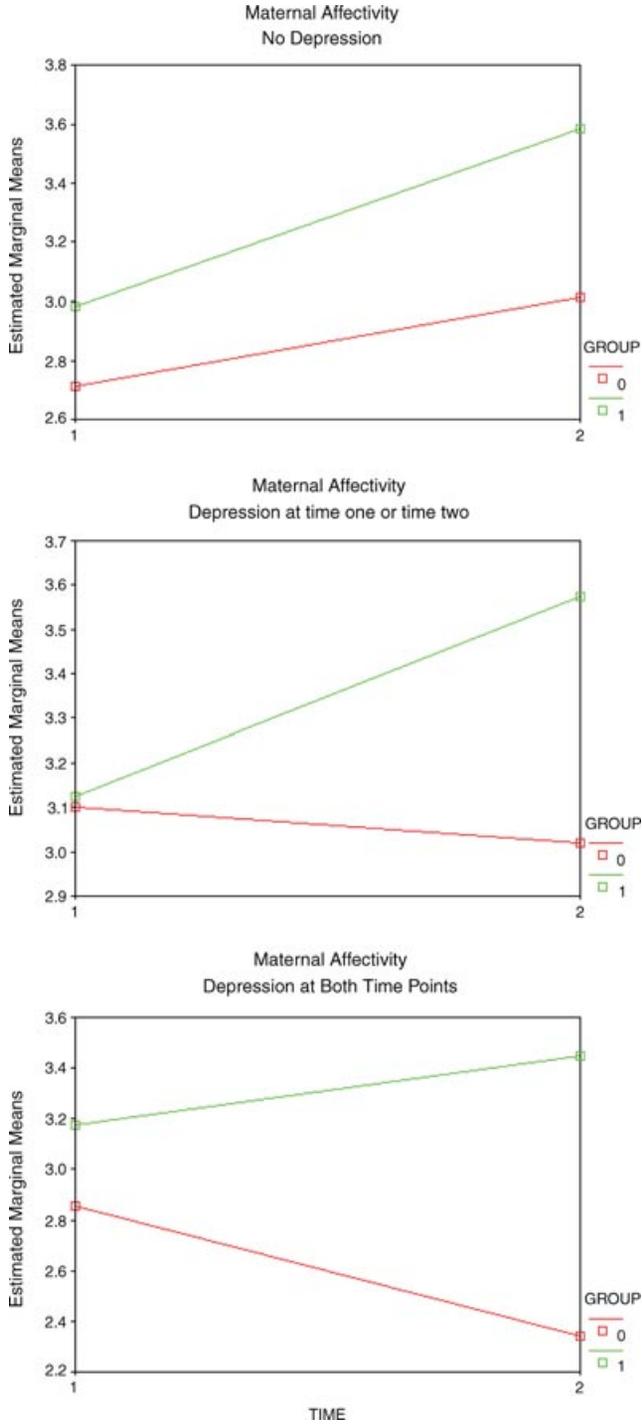


FIGURE 2. MBRS Factor 2 Affect/Animation and depression outcome in treatment (1) and control (0) mothers.

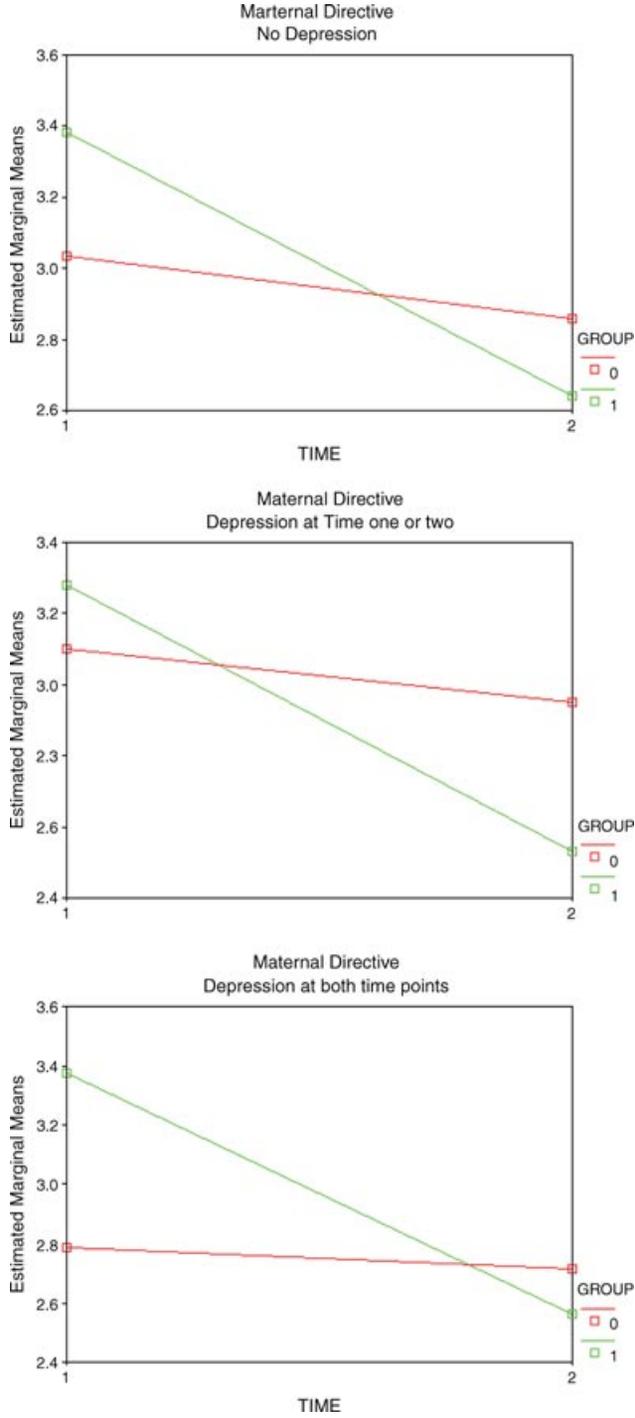


FIGURE 3. MBRS Factor 4 Directive and depression outcome in treatment (1) and control (0) mothers.

**TABLE 4.** Parenting Stress Index

Parenting Stress Index after removing those scoring significantly on Defensive Responding						
	treatment vs. comparison school	<i>n</i>	<i>M</i> Pretreatment	<i>M</i> Posttreatment	Paired <i>t</i> test	Two-tailed significance
Parental Distress	Treatment group	37	30.95	29.97	1.73	.092
	Comparison group	32	34.33	29.50	3.34	.003*
Parent–Child Dysfunctional Interaction	Treatment group	37	21.43	19.19	2.71	.010*
	Comparison group	32	20.71	20.58	.071	.944
Difficult Child	Treatment group	37	25.53	26.06	–.568	.574
	Comparison group	32	25.21	24.21	.874	.391
Total Stress	Treatment group	37	78.14	74.08	1.92	.064
	Comparison group	32	80.25	74.29	1.92	.073

\* $p < .01$ .

clinical picture of a mother's disorder can change, there are large possibilities for change in the capacity to mother which can be brought about through supportive treatment and guidance" (p. 178). Heinicke et al. (1999) reported that in their outcome study of an intervention for mothers at risk for inadequate parenting, self-report indices of depression and anxiety at 12 months did not differentiate intervention and comparison groups; however, they hypothesized that such changes might be observable by the second year of intervention. Further, Beebe's (in press) microanalytic face-to-face mother–infant studies have resulted in clinical interventions that target particular modalities of communication, such as vocal rhythms, gaze, touch, self-touch, and facial affect. In these interventions, she teaches mothers to alter particular behaviors to help repair troubled relationships (Beebe, 2000). She suggests, for instance, that depressed mothers can be helped to track their infant's look-look away patterns, to consider infant self-touch/self-comfort patterns, and to alter self- and interactive regulation (Beebe, in press). These interventions alter interaction without specifically targeting the mother's depression.

Targeting mother–infant interaction is critical even when depression is being treated. Weinberg and Tronick (1998) reported a study of mothers in treatment for depression, panic disorder, and obsessive-compulsive disorder. These patients reported that although symptoms ameliorated to the point of being comparable to control mothers with no diagnoses, their infants' socioemotional development and affective responses were compromised. Thus, although mothers reported improvement in their symptoms, interactions revealed that mothers were still more disengaged, talked less, touched their infants less, were less inclined to share infants' attention to objects, and showed fewer facial expressions of interest.

Our central finding that treatment mothers improved in the areas of responsiveness, affect availability, and directiveness can be understood in the following ways. In all aspects of our intervention protocol, we have stressed reflection over reaction, encouraging mothers to become baby watchers with us and to ponder what we see. Concurrently, we think together about what the mother is thinking and feeling, encouraging her to think about what may be on her baby's mind. The therapist being interested in the mother while the mother thinks about her child creates a hierarchy of support that may allow the mother to attune more sensitively to her child in an affectively mirroring way. Being affectively heard may allow her to be more affectively present for her child.

What do these changes in maternal behavior mean for the baby's world (see Mayers & Siegler, 2004)? To answer this question, we will consider each factor of the MBRS individually. In the responsive/child oriented factor, both treatment and comparison mothers initially had difficulty detecting the more subtle communications from their children, mothers' responses were frequently slow or inappropriate, and there was little reciprocal interaction between mother and baby. After intervention, treatment mothers had learned to detect subtle communications more frequently and to respond to their children's behaviors appropriately and promptly throughout their interactions. Most importantly, they learned to facilitate a reciprocal exchange of turns in play and communication that is so important for the child's development of a sense of agency. In contrast, comparison mothers continued to show little reciprocal interaction, and their responses remained slow and/or inappropriate.

In the affect/animation factor, both treatment and comparison mothers initially presented as generally approving of their children, but with only moderate positive affect displayed. They were moderately inventive and moderately expressive, and there was a low intensity of enjoyment manifest. At the end of their participation, treatment mothers improved approximately  $\frac{1}{2}$  a scale point. Clinically, this higher level shows mothers who are more accepting of their children, more generous with approval and affection, and who manifest enjoyment more frequently. These mothers are overtly expressive and inventive. Though  $\frac{1}{2}$  a scale point of improvement may seem small, it is important to recall that within this particular population of teen mothers, 38.6% were found to be depressed, making the affect factor particularly resistant to improvement. Nevertheless, this finding helped us refine our protocol for subsequent applications of the intervention.

The directive factor relates to how controlling or manipulative the mother is in the play interaction. Both treatment and comparison mothers began as moderately directive of their child's play, although treatment mothers were found to be somewhat more directive. At this time, treatment mothers tended to display steadily suggestive behavior, introducing new activities while the baby was still engaged in exploring. Some of these mothers appeared to be bombarding the babies with toys and activities. At the end of the program, treatment mothers had learned to allow the baby to lead the play more often without interference, fostering a greater sense of agency in the baby. Comparison mothers did not evidence these clinical changes.

Because our interventions include the concept of keeping the baby's mind in our minds ("thinking about what the baby is thinking while I'm thinking about what I'm thinking," in the words of one of our participant mothers), even a depressed mother may be drawn out of her depression, at least intermittently, to share her child's affective state. This may lead her child to experience periods of being held in another's mind and understood, and may allow the child to feel a sense of potency and agency as the "director" of the play. We hypothesize that these moments of feeling understood, held, and powerful may balance other depressed, unavailable aspects of the mother and result in a "good-enough" environment for the baby. Mothering the mother, supporting her reflection about her child, and helping her to follow the child's lead and intrude less or conversely imitate more (Malphurs et al., 1996; Pickens & Field, 1993) all work together to alter the mother–infant system of interaction, which simultaneously brings change in the infant.

Changes in infant interest in mother, response to physical contact and general emotional tone can be seen as intertwined with changes in maternal behavior. We hypothesize that when a mother is more affectively cued to her child, more responsive, and less directive, her irritability or depression may be less visible to the baby, and there will be less reason for the baby to

avoid her. The baby is then free to show increased interest in the mother. As mothers become more sensitive to how their behaviors—in particular, physical behaviors—affect the baby, they become less intrusive, and the baby’s response to physical contact improves.

Our findings also reflect an increase in aggression towards mothers among babies in the comparison group, but not in the treatment group. As infants develop into toddlers, we expect to see a developmental increase in aggressive behavior; however, we understand this finding to reflect a more thoughtful attitude among treatment mothers towards their child’s behaviors so that the child becomes better able to regulate negative affects, especially toward his or her mother.

Another important finding indicated that not only did the interactions of the treatment mothers improve on the MBRS but that unlike the comparison group, treatment mothers themselves endorsed better mother–infant/parent–child interactions as seen on the Parent–Child Dysfunctional Interaction subscale of the PSI. This is important because it bolsters self-esteem in the mothers and provides an impetus for continuing to work towards positive interactions.

### LIMITATIONS AND FUTURE CONSIDERATIONS

There are several biases in the design of this study that need be noted. First, in choosing our comparison group, we chose schools that matched treatment schools in ethnic makeup, socioeconomic status, and school configuration as closely as possible. As stated earlier, treatment and comparison groups showed no statistical demographic differences except that the mothers in the treatment schools were surprisingly younger than those in the comparison schools, for which we can find no explanation. Practical considerations inherent in running the program made it impossible to create a true random sample with dyads chosen randomly from each site as treatment and comparison participants. Second, we were able to include in the study only students who returned releases for videotaping, which may have further skewed the sample. Third, it could be argued that we were “teaching to the test” in using the videotapes as teaching tools with the treatment mothers so that they learned what to do on the tape from the interventions itself; however, it was our experience that although a mother recognized and repudiated certain behaviors that she observed in herself on tape (“Oh I keep taking things out of his hands! I don’t like this tape, can we do it again?”), she could not necessarily change her behavior without ongoing intervention.

Some questions for future research include: Have the treatment mothers indeed learned a new way of thinking or have they simply learned specific behaviors? Can we quantify whether these behaviors generalize across settings? Finally, are these interactional gains maintained over time?

### SUMMARY AND CLINICAL IMPLICATIONS

In summary, the intervention undertaken by the *Chances for Children* Teen Parent–Infant Project can be seen as contributing to changes in the interaction between teen mothers and their infants in that (a) mothers became more responsive, affectively more available, and less directive with their infants; and (b) the infants showed more interest in their mothers, responded more positively to physical contact, and improved their general emotional tone. Furthermore, these gains were shown even in the subset of mothers who scored in the depressed range on the CES-D. Because

evidence of depression in adolescent mothers appears to be so high, because altering depression alone does not necessarily alter interactions (Weinberg & Tronick, 1998), and because mother–infant interaction appears to be easier to alter fairly quickly than is depression, intervention protocols that can target adolescent mothers and change mother–infant interactions in high-risk communities should be expanded. Onsite programs in particular can be useful in reaching many teens who otherwise might never have access to desperately needed services.

## APPENDIX 1

### *The 10 Infant Scale Items*

1. Infant's interest in mother: 5-point item ranging from *no interest* to *constant interest*.
2. Infant's display of irritability: 5-point item ranging from *constant irritability* to *no display of irritability*.
3. Infant's soothability: 5-point item ranging from *inconsolable* to *responds to mother's efforts almost immediately*.
4. Infant's response to physical contact: 5-point item ranging from *negative affect always displayed* to *highly positive response: laugh, coo, gurgle*.
5. Infant's general emotional tone: 5-point item ranging from *child seems unhappy throughout observation* to *radiates happiness; nothing is upsetting; animated*.
6. Infant's gaze at mother: 3-point item ranging from *never or rarely looks at mother or constantly or almost constantly looks at mother* to *appropriate gaze at mother, from a few glances to many*.
7. Infant's verbalizations: 3-point item ranging from *no vocalizations* to *frequent to steady stream of vocalizations*.
8. Infant's aggressive behavior with mother: 5-point item ranging from *none seen* to *very aggressive, more than 6 aggressive behaviors*.
9. Infant's aggressive behavior with toys: 5-point item ranging from *none seen* to *very aggressive, more than 6 aggressive behaviors*.
10. Infant's cooperation: 3-point item ranging from *oppositional* to *cooperative*.

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