CLINICAL INTERVIEW FOR HIGH-RISK PARENTS OF PREMATURE INFANTS (CLIP) AS A PREDICTOR OF EARLY DISRUPTIONS IN THE MOTHER– INFANT RELATIONSHIP AT THE NURSERY

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ABSTRACT: The relations between mothers' narrative regarding the infant and the premature birth and the quality of mother–infant interaction were examined in mothers of 47 very low birth weight ($<$1650 g) premature singletons prior to discharge. Maternal representations were assessed with the Clinical Interview for high-risk Parents of premature babies (CLIP), a semistructured interview that explores mothers' experiences of the pregnancy, delivery, hospitalization period, thoughts and feelings about the infant, and impending discharge. Ten minutes of mother–infant interaction were videotaped, and global and micro-analytic codes were used to define three interactive variables: maternal adaptation, maternal touch, and infant withdrawal. Factor analysis of the CLIP items identified two factors with eigen values of 2.00 and above, termed Readiness for Motherhood and Maternal Rejection. Regression analyses were used to predict the three interactive variables by the infant's medical condition, maternal anxiety and depression, and the CLIP factors. Maternal adaptation to the infant's signal and maternal positive touch were each uniquely predicted by the mother's readiness for the maternal role, and were each negatively related to maternal depression. The infant's interactive withdrawal was independently predicted by maternal rejection. The clinical implications of the findings and the potential use of the CLIP for routine detection of early disruptions in the mother–infant relationship are discussed.

RESUMEN: Se examinó la relación entre lo que dice la madre sobre el infante y el nacimiento prematuro y la calidad de la interacción entre la madre y el infante, en un grupo de madres de 47 niños sietemesinos

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de muy bajo peso al nacer (<1650 gr), antes de dárseles de alta. Las representaciones maternas fueron evaluadas por medio de la Entrevista Clínica para Madres de alto riesgo de niños prematuros (CLIP); una entrevista semiestructurada que explora las experiencias maternas en los períodos de embarazo, parto y hospitalización; los pensamientos y sentimientos acerca del infante, y la inminente dada de alta. Se grabaron en vídeo diez minutos de interacción entre la madre y el infante, y se usaron códigos globales y microanalíticos para definir tres variables interactivas: la adaptación materna, el tacto materno, y los síntomas de aislamiento y abandono en el infante. El análisis de factores de los puntos de CLIP identificó dos factores con valores de 2.00 o más: la buena disposición a la maternindad y el rechazo materno. Se usaron los análisis de regresión para predecir las tres variables interactivas, según la condición médica del infante, la ansiedad y depresión materna, y los factores de CLIP. La adaptación materna a las señales del infante y el positivo tacto materno fueron ambos previstos en forma única por la disposición de la madre hacia el papel materno, y fueron ambas relacionadas negativamente con la depresión materna. El abandono o decaimiento de la interactividad del infante fue previsto independientemente por medio del rechazo materno. Se discuten las implicaciones clínicas y el posible uso de CLIP en la dirección rutinaria de los primeros trastornos que aparecen en la relación entre madre e infante.

RÉSUMÉ: Les relations entre la narration des mères à propos du nourrisson et de la naissance prématurée, ainsi que la qualité de l'interaction mère-nourrisson, ont été examinées chez des mères de 47 enfants uniques prématurés au poids de naissance très bas (<1650gr), avant de quitter l'hôpital. Les représen-tations maternelles ont été évaluées avec le CLIP (entretien clinique pour les parents à haut risque d'avoir un bébé prématuré), un entretien semi-structuré qui explore les expériences que font les mères de la grossesse, de l'accouchement, de la période d'hospitalisation, leurs pensées et sensations à propos du nourrisson, et le départ imminent de l'hôpital. Dix minutes d'interaction mère-nourrisson ont été filmées à la vidéo, et des codes globaux et micro-analytiques ont été utilisés pour définir trois variables interac-tives: l'adaptation maternelle, le toucher maternel, repli sur soi du nourrisson. Les analyses de facteur des points du CLIP ont identifié deux facteurs avec des valeurs eigen de 2,00 et plus, nommés Etre prête pour la Maternité et La Réjection Maternelle. Les analyses de régression ont été utilisées pour prédire les trois variables interactives de part la condition médicale du nourrisson, l'anxiété et la dépression maternelle et les facteurs CLIP. L'adaptation maternelle au signal du nourrisson et le toucher positif maternel ont chacun été prédits de manière unique par le fait que la mère était prête ou non à son rôle maternel, et ont chacun été lié de manière négative à la réjection maternelle. Les implications cliniques des résultats et de l'utilisation potentielle du CLIP pour une détection de routine de perturbations précoces dans la relation mère-nourrisson sont discutées.

ZUSAMMENFASSUNG: Der Zusammenhang zwischen der Erzählung der Mutter im Bezug auf ihr Kind und dessen Frühgeburt einerseits und der Qualität der Mutter – Kind Interaktion andererseits, wurde bei 47 Frühgeborenen (keine Zwillinge) mit sehr niedrigem Geburtsgewicht (< 1650 Gramm) vor der Entlas-sung, erhoben. Die mütterlichen Repräsentationen wurden mit dem Interview für Hochrisikoeltern Frü-hgeborener (CLIP) einem halbstrukturierten Interview, das die mütterlichen Erfahrungen während der Schwangerschaft, der Geburt und dem Spitalsaufenthalt erhebt, gesammelt und Gedanken und Gefühle zu dem Kind und zur bevorstehenden Entlassung erhoben. Zehn Minuten der Mutter – Kind Interaktion wurden gefilmt; danach wurden allgemeine und mikroanalytischen Kodierungen verwandt, um drei in-teraktionelle Variablen zu definieren: mütterliche Anpassungsleistung, mütterliche Berührung und kind-licher Rückzug. Die Faktorenanalyse des CLIP zeigte zwei Faktoren mit Werten von 2.00 und darüber, und zwar die Bereitschaft Mutter zu sein und die Zurückweisung des Kindes durch die Mutter. Regres-sionsanalysen zeigte drei miteinander verbundene Variablen nämlich einerseits der medizinische Zustand des Kindes, die mütterliche Angst und Depression und die CLIP Faktoren, die geladen waren. Die müt-terliche Anpassung auf die kindlichen Signale und die mütterliche Berührung waren beide unabhängig geladen positiv durch die Bereitschaft der Mutter ihre Rolle zu übernehmen und negative geladen zur mütterlichen Depression. Der kindliche Rückzug war als Variable unabhängig durch die Variable: müt-terliche Zurückweisung beeinflußt. Die klinische Bedeutung dieser Ergebnisse und die Möglichkeit CLIP für die Entdeckung von Störungen in der Mutter – Kind Beziehung in der Alltagspraxis zu verwenden wird diskutiert.

抄録：乳児に関する、そして未熟な出生に関する母親の物語と、母親-乳児相互作用の質との間の関係が、極低出生体重**(<1650g)**の単生の未熟児の母親４７人に、退院前に調査された。母親の表象は、未熟児のリスクの高い親のための臨床的面接 **Clinical Interview for high-risk Parents of premature babies (CLIP)**を用いて評価された。これは、妊娠、分娩、入院期間についての母親の経験、乳児および差し迫った退院ついての考えと気持ちを探索する半構造化面接である。**10** 分間の母親-乳児の相互作用がビデオに録画され、そして３つの相互作用変数、すなわち母親の適応、母親のタッチ、そして乳児のひきこもりを定義するために、全体的なおよび微少分析のコードが使われた。**CLIP** 項目の因子分析から **2.0** 以上の固有値を持つ二つの因子が同定され、母性準備性と母親拒否と名付けられた。回帰分析が、乳児の医学的状態、母親の不安と抑うつ、および **CLIP** の因子によって、３つの相互作用変数を予測するのに使われた。乳児の信号に対する母親の適応と、母親のポジティブなタッチは、母親役割への母親の準備性によって、それぞれ独自に予測され、そしてそれぞれが母親の抑うつと反対方向に相関していた。乳児の相互作用からのひきこもりは、母親拒否によって、独立して予測された。所見の臨床的意味と、母親-乳児関係性の早期の中断を日常的に探知するための、**CLIP** の可能性のある使用法が、議論される。

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It has been suggested that the quality of the early mother–premature infant interaction is related to the premature delivery and disruption in the ongoing process of prenatal maternal preoccupation and attachment (Brazelton & Cramer, 1990). Pederson, Jenkins, Evans, Chance, and Fox (1985) pointed to the potential impact of the premature delivery on the mother's feeling of womanhood as well as her sense of motherhood. Ammaniti's work (1991) similarly indicated that following premature birth, there may be a greater discrepancy between the mother's imagination and fantasies of her child and the premature infant born sick, as compared to normal birth.

The early mother–child relationship includes both actions and representations (Stern, 1995). The mother's representation of her infant and her behavior style are not independent factors but are interrelated: maternal perception affects the mother's interactive behavior, and repeated maternal behavior creates a representation of the infant and the mothering process (Nover, Shore, Timberlake, & Greenspan, 1984). In this context, Stern, Burschweiler-Stern, and Freeland (1998) conceptualize the birth of a premature infant as a potentially traumatic event. Premature birth derails the parent's ability to imagine the infant's future, makes the recent past of the pregnancy with its fantasies too painful to remember, and captures the parent in the frightening and deceiving present. Several studies have shown that mothers of premature infants tend to have more negative representations of their infant as compared to mothers of full-term and premature infants are often perceived as more difficult in routine tasks such as feeding and sleeping (Leonard, Scott, & Erpestad, 1992; Levy-Shiff, Sharir, & Mogilner, 1989). Such maternal perceptions during the first weeks may have a negative impact on the early mother–infant relationship. Mothers of premature infants tend to spend less time with their infants, talk, look, and touch the infant less frequently, and attend less regularly to the infant's basic care needs during the first weeks of life (Davis & Thoman, 1988). The disruption in the mother–infant relationship is likely to persist into the first months of life. Maternal engagement with the child prior to discharge from the hospital has been shown to predict the mother's engagement with the premature infant during home observation at three months (Minde, Marton, Manning, & Hines, 1980). Minde et al.'s (1989) longitudinal study point to the importance of the mother–premature newborn relationship. At four years of age, the likelihood of a behavior disorder was four times higher in premature infants compared to a matched control

group, and the mother–child relationship and family functioning were among the central pre-dictors of the child's behavior problems. Thus, it appears that premature birth is a risk factor for the development of the mothering process, in terms of maternal psychological distress, and consequently to less-than-optimal patterns of mother–infant interaction beyond the period of hospitalization and well into the infant's early childhood.

In line with these findings, a growing number of Neonatal Intensive Care Units (NICUs) have tried to adapt their environment and services to decrease the potential negative impact of prematurity on the early parent–infant relationship. Minde (2000) has summarized measures that have been shown to be effective in improving the premature infant's and his/her parents' well being, with the goal of enhancing bonding and attachment processes. Such measures include planning facilities that make visiting a comfortable task for parents, having parents participate in routine care of their infant, specific handling, and holding techniques (Als, 1992; Als, Duffy, Mc Anulty, 1996), including the "Kangaroo Care" method (Feldman & Eidelman, 1998; Ludington & Golant, 1993), assigning a key nurse and a key physician, and giving parents the opportunity to sleep at least one night with their infant. These measures are applied to all parents in the NICU, and indeed, most parents eventually overcome the psychologic distress involved in prematurity. The role of the mental health clinician at the NICU is to detect the parents who have individual needs that are not necessarily met by these measures and who will require individual psychologic intervention before and after discharge. Detection is not a goal in itself, and has no meaning if not followed by some kind of intervention. Detection of anxiety and depression, both common in parents of premature infants (Brooten et al, 1988; Corter & Minde, 1987; Crnic, Greenberg, Ragozin, Robinson, & Basham, 1983) is often done by the administration of self-report questionaires, which are not applied routinely in intensive care units. In addition to the well-known biases of self-report measures, administration of questionnaires might not be the optimal mode of engaging parents in a relation that will enhance a working alliance, especially with the less psychologically minded and more resistant couples. In this context, Meyer, Coll, Lester, Boukydis, McDonough, and Oh's (1994) intervention study was unique in planning an individualized psychosocial discharge plan, that was shown to reduce maternal stress and depression, and to enhance early mother–infant feeding inter-actions. One of the tools Meyer and colleagues (1994) used was the semistructured Clinical Interview for high-risk Parents of premature babies (CLIP), previously developed in the context of a multidisciplinary psychosocial training program. The interview was intended to review together with the mother her attitudes towards the pregnancy itself, her reactions to the early termination of the pregnancy and to the delivery itself, her fantasies regarding the infant and the future relationship, her fears of losing the infant, and her thoughts and worries concerning parenting such a fragile child (Meyer, Zeanah, Boukydis, & Lester, 1993). The researchers found the interview useful as both a detection tool for mothers in psychologic need and as a working-through process of the difficult experiences they had experienced with their premature infant. Despite this positive findings, the CLIP has not, to our best knowledge, been quantified nor used in routine psychosocial work in NICUs. Contingently, its components have not been studied in relation to other variables, such as the quality of the mother–premature infant in-teraction at the NICU.

In light of the aforementioned studies on the link between maternal representations of the infant and maternal behaviors, the goal of the present study was to examine the relationship between the pre- and postnatal representations of the premature infant, as reflected in the CLIP, and the quality of mother–infant interaction prior to discharge, once the infant's medical condition has stabilized. We selected to focus on three components of maternal and infant's early social behavior. First, we considered the maternal adaptation to the infant's state and interactive signal, a central component of the mothering style. Theory and research emphasize

the role of maternal sensitivity and adaptation in defining the quality of early relationship and in shaping the child's social emotional growth. Maternal sensitivity and responsiveness are defined as the adaptive and appropriate response of the mother to the infant's cues, and include qualities of warmth and emotional availability (Ainsworth, Blehar, Waters, & Wall, 1978; Bornstein & Tamis LeMonda, 1989; DeWolff & van IJzendoorn, 1997). Mother's sensitivity to the infant's signals has been linked to secure infant–mother attachment and interact with other child and family components in the prediction of attachment security (DeWolff & van IJzendoorn, 1997). Adaptation to the interactive cues of a premature infant is a challenging task for a parent, as these infants' communicative signals are often unclear. Lester (1989) found that preterm infants looked more physiologically stressed when their attentional system was activated, compared to full-term infants, resulting in a higher level of mysynchrony between mothers and premature infants (Lester, 1992).

Maternal touch was selected as an additional important determinant of the mother–preterm relationship. Touch comprises the most basic form of a two-way communication (Greenspan, 1992), and has a major impact on bonding and attachment processes (Spitz, 1945). Relating specifically to premature infants, the positive impact of tactile stimulation and massage therapy on premature infants' neurophysiologic measures, such as decreasing plasma cortisol levels, promoting vagal activity, and increasing gastrointestinal hormones that aids in the digestive process, has been demonstrated (Hernandez-Reif & Field, 2000). Minde, Whitelaw, Brown, and Fitzhardinge (1983) have shown that mothers of low-weight birth infants touched their infants significantly less than mothers of full-term babies even after the premature infant has recovered from their fragile medical condition. Feldman, Weller, Eidelman, and Sirota (2002) found that following mother–infant skin-to-skin contact, both mothers and fathers of premature infants tended to provide more affectionate touch to their infant during triadic mother–father–infant interactions at three months. Taken together, these finding may suggest that maternal affectionate touch may be used as an index of the quality of the mother–preterm interaction.

Infant withdrawal behavior was selected as a measure of the infant's engagement/disengagement in the interaction. Brief withdrawal is a normal mechanism of regulation during mother–infant interaction (Beebe, Lachmann, & Jaffe, 1997; Brazelton, Klosowski, & Main, 1974; Weinberg & Tronick, 1994). However, beyond a pause of short duration, infant withdrawal represent the child's response to a nonattuned interaction (Cohn & Tronick, 1983; Tronick & Weinberg, 1997). Organic causes, such as fever, dehydration, postictal state, intoxication, neurological diseased, visual and auditory sensory impairments have all been linked to infant withdrawal behavior (Behrman, Vaughan, & Nelson, 1983). It has also been reported as a reaction of young children who have suffered from chronic and severe pain (Gauvain-Piquard, Rodary, Rezvani, & Lemerle, 1987). Fraiberg (1982) described avoidant behavior as one of the pathologic defenses observed among infants of three to 18 months of age who have experienced extreme conditions. The major clinical nonorganic situations where infant withdrawal has been observed are mainly attachment disorders (Zeanah, Boris, Baskshi, & Lieberman, 2000), infant depression (Guedeney, 2000), autism, and post-traumatic stress disorder (Scheeringa & Gaensbauer, 2000). In a study that compared mother–infant interactions among referred and nonreferred families, we found that infant's withdrawal was significantly higher in the referred group during the feeding interaction, regardless of the child's DC 0-3 diagnoses (Keren, Feldman, & Tyano, 2001). Recently, the notion of infant withdrawal as a major component of the infant's response to a noncontingent type of relationship, has led Guedeney and Fermanian (2001) to develop an assesment scale for sustained withdrawal reaction in infancy. Thus, maternal adaptation, maternal touch, and infant withdrawal behaviors were used as our indices for the quality of the mother–preterm interaction and were examined in relation to the quality of the maternal narrative expressed in the CLIP. It was also of interest whether the

infant's medical condition would have an impact on the mother or child's interactive behavior and on the CLIP narratives.

We hypothesized that a coherent working through of the traumatic experience of the premature birth and hospitalization and positive maternal representations of the infant and herself as a parent at the NICU, as reflected in the CLIP interview, would be linked with more optimal maternal interactive behavior prior to discharge. Positive representations, such as positive feelings towards pregnancy, readiness for birth, positive feelings about infant, confidence in self as parent, confidence in staff, readiness for discharge were expected to predict more maternal touch and adaptation, as observed in the interaction. Negative representations, such as negative first reaction to pregnancy, unplanned pregnancy, feeling of lack of mutual recognition, discrepant expectations for baby's future and negative affect during interview, were expected to predict more infant withdrawal behavior in the interaction.

In addition, based on the accumulated knowledge that maternal anxiety and depression are significant environmental risk variables (Sameroff, 2000), we expected self-reported anxiety and depression to be related with less optimal interactive behaviors at the NICU.

METHOD

Participants

Participants were 47 mothers of premature babies with birthweight between 535 and 1,650 g. Gestational age was estimated according to last menses and clinical examination. Infants sample included 47 singletons. Preselection criteria included mothers between the age 20 and 40 years, with at least high school education (with or without diploma), married to the child's father, and in all families at least one parent was employed. Maternal demographics and infant medical variables appear in Table 1.

Participants were recruited in two NICUs, one in the Tel-Aviv area, the other in Jerusalem. Exclusion criteria included twins and triplet births, genetic diseases, congenital neurological diseases, and intraventricular hemorrhage grade IV. The two hospitals are tertiary level care centers. Recruitment was conducted over six months, and out of 54 mothers and infants who fit the study criteria and were approached, seven refused to participate. These mothers and infants did not differ in any demographic or infant medical variables from the participating families.

Procedure

Mothers were approached when the infant's medical condition stabilized and discharge was planned within the next week or two and asked for their participation in the study. Following

TABLE 1. *Maternal Demographic and Infant Medical Variables*

	M	SD	*Range*
Birthweight (g)	1223.90	366.43	535–1650
CA (weeks)	29.37	2.88	25–34
CRIB (medical risk score)	3.34	3.73	0–13
Mother age (years)	28.60	6.09	20–40
Mother education (years)	13.66	1.97	12–22
Weeks in hospital	8.38	4.32	3–18
M/F ratio 29/18			

an informed consent, mothers were interviewed with the CLIP by a trained clinical psychologist or social worker and were asked to complete a battery of self-report measures. Finally, mothers and infants were videotaped in a 10-minute mother–infant play interaction in a quiet room in the NICU several days before discharge. Videotaping of the interaction was scheduled in the same week as the interview, to avoid intercurrent events that might have an emotional impact on the mother. Mothers were given no specific instructions and were asked to interact with the infant as they normally do.

Measures: Clinical Interview for Parents of High-Risk Infants (CLIP)

We used the CLIP version as it has been developed by Meyer et al. (1993). Eight main areas are covered, in a nonobligatory order:

1. Infant's Current Condition: "I wonder if you would tell me how your baby is doing now." The purpose of this question is more to check the way the mother perceives her infant's present status and to set the initial emotional tone of the interview, than to get medical information.

2. Pregnancy Course: "I'd like to have you discuss a bit about your pregnancy. Let's start with your initial reaction—What was that like? Was the pregnancy planned or a surprise? Overall, how was it for you physically? Emotionally? When did the pregnancy begin to seem real to you? Was there a time when you felt that you felt that something had gone wrong in your pregnancy.

3. Labor and Delivery: "Tell me about your labor and delivery. What were your thoughts? Feelings? Were you aware of having concerns about yourself during that time? About your baby? How did it compare with what you expected?"

4. Relationship with Baby and Feelings as a Parent: "How did you react when you first saw your baby? What is your baby like now? Do you feel your baby knows you? How do you feel about your baby? Have you had any feelings as if your baby does not really belong to you? In general, do you feel confidence in yourself as a parent? How would you compare the way you were raised to the way you plan to raise your child? What do you expect to be particularly difficult/enjoyable about being a parent to your baby?

5. Reactions to NICU Environment and Staff: "Describe your first reaction to the intensive care nursery. What has been most difficult for you there? From your point of view, what have been the positive and negative aspects of the nursey? What have your experiences with the staff have been like?"

6. Relationship with Family and Social Support: "What has this experience been like for your spouse (partner). How has your relationship been affected? How have your other children reacted? What about the rest of the family? Who is available to you for help now and after discharge? Is there anyone who has made things more difficult for you?"

7. Discharge and Beyond: "At this point, as you look ahead, what do you see for yourself and your baby? Have you thought much about discharge? What do you expect it to be like? Do you have any concerns? What are your own plans regarding work? Child care? What is your impression about your baby's future development?"

8. Wrapping up "Given all your experiences in the intensive care nursery, is there anything you would like to suggest to make things better for parents and their babies? What

would you say to parents whose babies have just been admitted? Do you have any questions you want to ask me?

A special coding scheme was developed for this study to analyze the mother's narrative content and affective expression during the interview. Infant's Current Condition was coded according to the presence of fear of loss, pregnancy was divided into items of first reaction to pregnancy (positive, ambivalent, negative), planned pregnancy (yes/no), course of pregnancy in terms of physical and/or emotional complications, timing of "pregnancy feeling real" (urine test, first US, fetal movements, delivery, never). Questions about Labor and Delivery were coded in terms of readiness for delivery (expected, somehow expected, totally unexpected) and fear of loss during delivery (no fear, fear for baby, fear for baby and herself, fear for herself, unconscious state). Relationship with Baby and Feelings as a Parent were divided into first feelings towards baby (positive, ambivalent, negative), present feelings towards baby, feeling of mutual recognition (definitely, in doubt, none), parental self-image (secure, not quite secure, insecure). Reaction to NICU was divided into reaction to staff (total confidence, partial, no confidence), reaction to NICU setting (monitors enhance feeling of security, are securing but frightening, are frightening and not securing). Support System was coded as full/partial/absent. Discharge and Beyond was divided into foreseen future for baby (appropriate expectations, partially appropriate, discrepant expectations) and readiness for discharge (feels ready, partially ready, not ready at all). Three additional items described the quality of the mother's narrative during the interview: (1) Affect (mostly positive, mixed, mostly negative); (2) Organization of content (well-organized, moderately organized, poorly organized); (3) Richness of content (Full answers, partial answers, laconic answers). Interviews were transcribed and coded by the interviewer, who was blind to the infant's medical condition (coding manual can be obtained from first author) and to the quality of the mother-infant interaction. Interrater reliability was conducted on 10 interviews and interrater reliability on all items exceeded 85% percent of agreements, intraclass, $r = .86$.

Infant Medical Risk

Infant medical risk was measured according to the CRIB (International Neonatal Network, 1993). The CRIB is an objective quantitative measure of neonatal risk for infants born prematurely. Each of the following items receives a certain score according to predetermined range: birthweight, gestational age, minimum and maximum fraction of inspired oxygen, minimum base excess during the first 12 hours, and the presence of congenital malformations. Scores were then summed to create the total CRIB score. The CRIB has been validated to be a more robust index of severity of disease than birth weight alone. Infants were grouped into high- and low-risk groups using the median split of the CRIB scores. The median score for the CRIB was 1.00. Two infants received very high CRIB scores (11, 13). The CRIB score reflects the infant's medical status in the first day of life and high scores do not predict a continuing poor medical condition. Thus, including the cases of high CRIB score whose condition improved in this study, is valid. In addition, the CLIP items and the mother–infant interaction variables for these infants were within the normal range and they were thus not considered as outliers.

The State-Trait Anxiety Inventory. Trait anxiety was measured with the State-Trait Anxiety Inventory (Spielberger, Gorsuch, & Lushene, 1970). This well-validated instrument (e.g., Blumberg, 1980) uses separate scales to measure stable individual differences in anxiety proneness (trait) and current states of anxiety. Anxiety scores were within the normal range for Israeli

women and none exceeded the clinical cutoff (Teichman & Melnick, 1976). In this study we used the Trait Anxiety scores to focus on the more stable dimension of maternal anxiety rather than on the random state-mediated variability. Internal consistency for trait anxiety was, alpha = .85.

Beck Depression Inventory. Mothers' depressive symptoms were assessed with the Beck Depression Inventory, BDI (Beck, 1978). This inventory includes 21 items that measure the level of depressive symptoms. The BDI is the most widely used self-report instrument for the assessment of depressive symptoms, with well-established reliability and validity (e.g., Bumberry, Oliver, & McClure, 1978). Internal consistency for this sample was, alpha = .84.

Coding of Mother–Infant Interaction

Mother–infant interactions were coded twice, using microanalytic and global coding schemes. Microanalytic coding was conducted for each 10-second epochs according to a system previously developed for mothers and premature newborns (Feldman, 1998). In the present study we used two microlevel categories, maternal touch and infant gaze. Each category included a set of mutually exclusive codes: *Maternal Touch,* included mother rocking the infant in her arms, hugging the child, mother's affectionate touch (e.g., caress, kiss), and mother physically stimulating the infant, and no touch. *Infant Gaze* included infant fuss-cry, attention to mother, attention to environment, gaze aversion, and sleep. Reliability between two coders who were blind to the mother's CLIP scoring was conducted for 15 mother–infant dyads, and mean reliability was 87%, kappa = .79.

For the global coding we used two codes from the Coding Interactive Behavior: CIB (Feldman, 1998). The CIB is a global rating system that includes 42 codes: 21 for parents, 16 for infants, and five for dyads. The coding system has been employed in several studies of healthy and at-risk dyads and has shown sensitivity to infant age and cultural background, and to infants at biological and social-emotional risk (Feldman, 2000; Feldman, Greenbaum, Mayes, & Erlich, 1997; Feldman, Masalha, & Nadam, 2001; Keren et al., 2001). For infants of older ages, there are a growing number of interactive codes that can be applied as the child matures. For newborns, however, the number of applicable codes is limited. We thus selected only two out of the 42 codes of the CIB for this study: Maternal Positive Affect and Maternal Adaptation. Each code was coded on a scale of 1 (low) to 5 (high). The two codes were averaged into Maternal Adaptation composite. Two coders, blind to the mother's CLIP information, conducted the global coding of maternal affect and adaptation. Reliability for the two global codes was conducted for 15 mother–infant dyads. Pearson correlations between coders averaged $r = .91$. Three final interactive variables were used in this study: Maternal Touch was computed as the sum of the relative proportions of the touch codes: rock, touch, hug, and stimulate. Infant Withdrawal was the relative proportion of infant gaze aversion. Both maternal touch and infant withdrawal codes were derived from the microanalysis. One code was computed from the global codes—Maternal Adaptation—which was the average of maternal adaptation and mother positive affect from CIB codes.

RESULTS

Prior to data analysis, the 19 items from the CLIP (16 questions and three global codes, organization, affective expression, and richness of content) were subjected to a principle- component factor analysis with Varimax rotation. Results of the factor analysis, including the items and the loading for each item, are reported in Table 2.

TABLE 2. *CLIP Interview Cluster Factors (Component Matrix)*

CLIP Interview Items	Factor I: Readiness for Motherhood	Factor II: Maternal Rejection
Fear of loss of premature baby	**− .75**	− .43
Readiness for birth	**.51**	.01
Positive first feelings towards baby	**.52**	.02
Positive present feelings towards baby	**.56**	− .43
Confidence in self as parent of baby	**.74**	− .11
Confidence in NICU staff	**.50**	− .22
Confidence in NICU equipment	**.51**	− .38
Good support system	**.70**	− .08
Feeling of readiness for discharge	**.75**	.02
Positive affect during interview	**.79**	− .05
Well-organized narrative	**.52**	− .20
Negative first reaction to pregnancy	− .12	**.65**
Unplanned pregnancy	− .21	**.62**
Lack of feeling of mutual recognition	− .36	**.50**
Discrepant expectations for baby's future	− .01	**.62**
Poor richness of content of interview	− .08	**.67**
Eigen Value	**4.95**	**2.39**
% of variance	**22.87%**	**12.15**

As seen in Table 2, two major factors emerged from the factor analysis, which together explain 35% of the variance. Items with loadings of .50 and above on the first factor were averaged into a composite termed *Readiness for Motherhood.* This factor included the following items: lack of fear of loss of the premature baby, readiness for delivery, positive first and present feelings towards baby, confidence in self as parent of baby, confidence in NICU staff and equipment, good support system, readiness for discharge, positive affect during interview and well-organized narrative. Internal consistency for this factor was alpha = .79. The second factor included: negative first reaction to pregnancy, unplanned pregnancy, lack of feeling of mutual recognition, discrepant expectations for baby's future, and poor richness of content of interview. These items were averaged into a composite termed *Maternal Rejection* (alpha = .74).

Descriptive statistics for all study variables are reported in Table 3. In this table we report means and standard deviations for the high-risk and low-risk premature infants separately and the *F*-values for the differences between the groups.

Results reported in Table 3 show that mothers of high-risk infants reported lower levels of readiness for motherhood as reflected in the CLIP, touched their infants less often, and were less adapted to their infant than mothers of low-risk infants. High-risk infants were more withdrawn during the interaction than low-risk infants. Maternal negative attitudes (Maternal Rejection factor), maternal depression and trait anxiety did not differentiate the two groups.

Bivariate correlations between the study variables are reported in Table 4. The strongest correlations ($p < .001$) were found between the interactive variables of maternal adaptation and maternal touch. Moderate positive correlations ($p < .01$) were found between Maternal trait anxiety and Depression, Readiness for motherhood and Maternal touch. Mildly significant links ($p < .05$) were found for Readiness for motherhood with Depression and with Infant's

TABLE 3. *Descriptive Statistics of Study Variables*

	Low-risk Infants		High-risk Infants		
	M	*SD*	*M*	*SD*	*F*
Readiness for motherhood[a]	1.58	.42	1.30	.34	4.97*
Maternal rejection[a]	1.42	.41	1.53	.43	NS
Depression[b]	4.96	3.03	6.14	4.87	NS
Trait anxiety[b]	34.82	6.01	36.05	3.96	NS
Touch[c]	.40	.31	.22	.17	3.97*
Maternal adaptation[d]	3.87	.67	3.34	.63	3.92*
Infant withdrawal[d]	.11	.09	.23	.18	4.78*

* $p < .05$.
[a] Factor from the CLIP, [b] self-report, [c] interaction coding, microanalytic, [d] interaction coding, global.

withdrawal. Maternal rejection as reflected in the interview was significantly related to the Infant's withdrawal.

We next computed three multiple regression models predicting mother–infant interactive variables—maternal adaptation, maternal touch, and infant withdrawal—by maternal and infant factors. Predictors were entered in three blocks in a theoretically guided order. In the first block, the infant's medical risk was entered to partial out variance related to biologic risk. In the second block, maternal personality variables-depression and anxiety—were entered. Maternal personality is considered to be the central predictor of the mother's response to the premature birth. In the immediate postbirth period, research attention has focused on the role of depression in mediating maternal representation and behavior and thus, depression was entered before anxiety. In the third block, the two CLIP factors, Readiness for Motherhood and Maternal Rejection, were entered, as the mother's representations of the infant and the relationship impact on her interactive behavior (Stern, 1995).

As seen in Table 5, Maternal adaptation was inversely predicted by maternal depression, and positively predicted by Readiness for motherhood. Maternal touch was inversely predicted by infant's medical status and by depression and positively strongly predicted by Readiness for Motherhood. Infant withdrawal was uniquely predicted by the Maternal Rejection CLIP factor. In combination, these variables explained 28% of the variability in Maternal adaptation, 37% of the variability in Maternal touch, and 25% of the variability in Infant withdrawal.

TABLE 4. *Bivariate Correlations Between the Study Variables*

	Readiness for Motherhood	Maternal Rejection	Anxiety	Depression	Maternal Touch	Maternal Adaptation	Infant Withdrawal
Readiness for motherhood							
Maternal rejection	.22						
Anxiety	.11	.12					
Depression	−.30*	.05	.46**				
Maternal touch	.46**	.15	−.12	−.05			
Maternal adaptation	.18	−.18	−.09	−.25	.68***		
Infant withdrawal	−.32*	.37*	.07	.11	−.17	−.07	

* $p < .05$, ** $p < .01$, *** $p < .001$.

TABLE 5. *Predicting Maternal Adaptation, Maternal Touch, and Infant Withdrawal*

Predictor	Maternal Adaptation			Maternal Touch			Infant Withdrawal		
	Beta	R^2 Change	F Change	Beta	R^2 Change	F Change	Beta	R^2 Change	F Change
Infant medical risk	−.25	.07	2.74	−.27*	.08	3.26*	.16	.04	1.49
Maternal depression	−.33*			−.31*			.22		
Maternal trait anxiety	−.27	.08	1.89	−.26	.06	1.57	.11	.02	.37
Readiness for motherhood	.37*			.47**			.24		
Maternal rejection	−.10	.13	3.41*	.03	.20	5.53**	.30*	.19	4.72*

R^2 total; .28; $F(5, 40) = 2.80$, $p < .05$; .37; $F(5, 40) = 3.74$, $p < .01$; .25; $F(5, 40) = 2.65$, $p < .05$
* $p < .05$, ** $p < .01$.

Maternal trait anxiety did not have an independent contribution to the prediction of the inter-active variables examined here.

DISCUSSION

This study examined the relations between mothers' representations of the premature delivery and the hospitalization at the NICU, as reflected in the Clinical Interview for high-risk Parents of premature babies (CLIP), and the quality of mother–infant interaction in the NICU.

In accordance with our hypotheses, mothers with positive representations had more optimal interactions with their premature infant at the NICU than mothers with negative representations, as reflected in the CLIP interview. Similarly, infant's interactive behavior, in terms of amount of withdrawal behavior, was predicted by negative maternal representations. Mothers of high risk preterm infants had lower readiness for motherhood.

It is of interest to examine the specific components included of the two factors on the CLIP. *Readiness for motherhood* included the content items of belief in child's survival, sense of parenting, trust in the NICU staff and environment, mental, and emotional readiness for discharge and presence of a good support system. It also included the item of narrative organization, which refers to a well-organized narrative that integrates both negative and positive experiences into a well-formed discourse. The construct of readiness for parenthood, as it is described here, may be related to Stern's concept of the "motherhood constellation" (Stern, 1995). According to Stern, four main questions preoccupy the new mother: can she maintain the life and growth of the baby (the "life growth theme"), can she emotionnally engage with her baby (the "primary relatedness theme"), will she provide a supportive environment (the "supporting matrix theme"), will she be able to transform her self-identity to facilitate these functions (the "identity reorganization theme"). The items included in the *Readiness for motherhood* factor are related to these core issues, suggesting that the CLIP may be used as a window into the "intrapsychic reorganization" (Stern, 1995) of mothers of very small premature infants. Viewing prematurity a risk factor for early mother–infant relationship may mean that the motherhood constellation is at risk. In addition to the fact that the very small birthweight infant is in life danger, the mother often has difficulties in reading or engaging the child (Lester, Baikydis, McGrath, Censullo, Zahr, & Brazelton, 1990), and the mother's parental role in the setting of the NICU is unclear, making the psychic changes that are supposed to happen within her often ambiguous. Lester and colleages (1995) found that matches and mismatches between

infant cry characteristics at one month and the mother's perception of the cry are related to cognitive and language outcome at 18 months in term and preterm infants. Developmental outcome was the result of the interplay between the clarity of the infant's signals and the mother's ability to accurately perceive and respond to these signals. This ability, in turn, was affected by factors such as social support and self-esteem, the same two factors that we found included in our factor of *Readiness for Motherhood.* In addition, Davis and Thoman's (1988) findings, that mothers of premature infants who expressed negative perceptions on the early mother–child interaction during the first weeks of life initiated significantly less interactive behaviors than mothers of full term babies, are in accordance with our factor of Readiness for Motherhood. These findings also support our hypothesis that the CLIP interview depicts quantifiable variables that are significant in terms of the early mother–child relationship.

Our findings showing that positive representations of the baby and of the hospitalization period had a unique contribution to the prediction of maternal touch on one hand, and that touch was strongly correlated to the mother's ability for adaptation to her infant on the other hand, are in accordance to the crucial role given to touch as a major bonding behavior that is determined by the mother's internal working models. Its continuing significance for the quality of the early mother–infant relationship has been shown in Polan and Ward's (1994) study of touch in mothers of children with failure to thrive. It was found that these mother–child interactions were strikingly lacking in reciprocal physical contact.

Depressive symptoms were independently and significantly related to the quality of mother–infant interaction. This is in accordance with the findings reported in a study assessing mental representations among mothers of premature infants (Feldman, Weller, Leckman, Kvint, & Eidelman, 1999), which showed that maternal depression was related to diminished maternal investment in the infant. It is important to note that the average scores of maternal depression did not reach levels of clinical depression, and therefore depression had not been reported by the staff and was only identified in self-report questionnaires. Nor were these depressive feelings linked to the infant's medical status. We suggest that subclinical depressive symptoms may impact on the mother's ability to transform her self-identity to facilitate the various parenting functions. The intrapsychic nature of this effect might explain its long-lasting duration, as it has been shown by Singer, Salvator, Guo, Collin, Lilien, and Baley (1999), who found that mothers of VLBW premature infants continued to report parenting stress at the child's age of three years.

The link between Readiness for Motherhood as depicted by the CLIP and maternal adaptation to the infant's behavior during the interaction is especially important in the context of what is known about the impact of maternal factors on infant emotion regulation. The majority of studies in this area have focused on the impact of maternal depression on the mother's ability to regulate her own emotions, which in turn, has been shown to impact on the infant's emotion regulation (Crockenberg & Leerkes, 2000). Our finding adds the factor of positive maternal representations of her premature infant and of herself as a parent to such a baby in the context of the NICU as an important component of the mother's adaptive skills during her interaction with a challenging difficult-to-read very small premature infant.

Maternal rejection included CLIP items such as unplanned pregnancy and negative first reaction to pregnancy, no feeling of mutual recognition, discrepant expectations for the infant's future, and poor richness of content of interview. In contrast to Readiness for Motherhood, maternal negative attitude towards the infant started much before the infant was born and was later linked to negative perception of the born baby. As Stern (1995) wrote about the rejecting mother (p. 42), "the maternal representation or fantasy cannot influence the baby magically" and only rejection, which is translated into concrete behaviors, such as negative affect in our case, can be perceived as such by the baby. Theses negative attitudes had a unique contribution

to infant withdrawal during interaction with mother. Taken together with the higher level of infant's withdrawal behavior in the high-medical risk group of premature infants, this finding is in accordance with the well-known mutual impact of the partners in the interaction, even very early in life (Sameroff & Fiese, 1999).

The infant's medical status is, as expected, one of the important factors of the parents' psychologic distress, and indeed, had a significant impact on both maternal representation of the infant's condition and of the hospitalization period (items included in the Readiness for Motherhood factor) and interactive behaviors. It did not impact the negative attitudes, as depicted in the Maternal Rejection factor, that were linked more to prenatal representations of the pregnancy than to the actual infant and hospitalization. The infant's medical status did not make any difference in levels of maternal depression and/or anxiety. These findings are surprising in the light of the common assumption among the NICU staff that the sicker the infant is, the more depressed and anxious is the mother. Consequently, high-risk dyads tend to receive more psychosocial attention than low-risk ones. If replicated, our findings suggest there is a need to change this routine clinical approach, such as deciding that the main criteria for psychosocial intervention should be the parents' psychologic status, and not the infant's medical status.

Finally, organization of the mother's narrative during the interview was a significant composite of the Readiness for Motherhood factor, and so was poorness of content in relation to maternal negative representations (Rejection) factor. These relations are somewhat akin to the theoretic and empirical link between the quality of the Adult Attachment Interview narrative and security of attachment representations (Hesse, 1999). A comparative study between the CLIP and the AAI of mothers at the NICU would be needed to prove this relation.

Limitations of the Study

Three issues should be mentioned as limitations of this study. First, fathers were not involved in the study because of logistic reasons. Second, because there was no follow-up of these mother–infant dyads after discharge, the long-term prediction from the CLIP to the later mother–child relationship awaits further research. Finally, we should remember that a rather small amount of the variance in the interactive behaviors were predicted by our regression model. However, as detecting early signs of maladaptive relationship may be viewed as the main task of mental health professionals at NICUs this may not be a functional limitation. As detailed observation of every mother and infant at the NICU is unrealistic, the routine use of a clinical interview such as the CLIP may be a practical alternative for the detection of the mother's readiness for motherhood, although not as the sole source of information (because of the mentioned limitations of our findings).

CONCLUSION

Mother–infant interactive patterns during the busy and stressed reality of today NICUs, and the mother's psychologic states during that time are often overlooked, especially when signs of maladaptive processes are subtle. Therefore, the expectation that nurses will be able detect dyads in need of psychosocial help toward discharge from the NICU is quite unrealistic. Furthermore, a close observation of mothers interacting with infants might be perceived as intruding and threatening to the more vulnerable mothers. The present results point to the relations between the indicators of the mother's working through of the experience of premature birth, the mother's psychologic factors and the mother–child interactive patterns when the infant reaches term age and approaches discharge. Several significant links between the explicit con-

tent of a clinical and easy-to-use interview for parents in the NICU, and implicit, nonverbal and probably unconscious features of the early mother–premature infant relationship were suggested. The link between the CLIP interview and the concept of motherhood constellation was discussed. As seen in the findings, the CLIP interview may be a useful routine tool, both as a wrapping-up tool of traumatic experiences related to prematurity, and as one of the detection tools for those mothers in need of psychologic support close to discharge home (and possibly after). Future studies need to replicate the these results, providing further support to the coding scheme, and address the link between maternal representations as depicted by the CLIP interview at the NICU close to discharge and later aspects of the mother–infant relationship and the child's social emotional growth may be examined. Studies that bridge between intrapsychic processes, such as the emergence of the motherhood constellation, and observable phenomena, such as mother–infant interactive behaviors, are especially relevant to the field of high-risk infants cognitive, social and emotional development.

REFERENCES

Ainsworth, M.D., Blehar, M.C., Waters, E., & Wall, S. (1978). Patterns of attachment: A psychological study of the strange situation. Hillsdale, NJ: Erlbaum.

Als, H. (1992). Individualized, family-focused developmental care for the very low birthweight preterm infant in the NICU. In S.L.Friedman & M.D. Sigman (Eds.), The psychological development of low birthweight children (pp. 341–388). Norwood, N.J: Ablex.

Als, H., Duffy, F.H., & McAnulty, G.B. (1996). Effectiveness of individualized neurodevelopmental care in the newborn intensive care unit (NICU). Acta Paediatrica, 416, 21–30.

Ammaniti, M. (1991). Maternal representations during pregnancy and early infant–mother interactions. Infant Mental Health Journal, 12, 246–255.

Beck, A.T. (1978). Beck Depression Inventory. San Antonio, TX: The Psychological Corporation, Harcourt Brace Jovanovich.

Beebe, B., Lachmann, F., & Jaffe, J. (1997). Mother–infant structures and pre-symbolic self and object representations. Psychoanalytic Dialogues, 2, 133–182.

Behrman, R.E., Vaughan, V.C., & Nelson, W.E. (Eds.). (1983). Nelson textbook of pediatrics (13th ed.). Philadelphia: W.B. Saunders.

Blumberg, N. (1980). Effects of neonatal risk, maternal attitude, and cognitive style on early post- partum adjustment. Journal of Abnormal Psychology, 89, 139–150.

Bornstein, M.H., & Tamis-LeMonda, C.S. (1989). Maternal responsiveness and cognitive development in children. In M.H. Bornstein (Ed.), Maternal responsiveness: Characteristics and consequences, new directions for child development (No. 43, pp. 49–61). San Francisco: Jossey-Bass.

Brazelton, T.B., & Cramer, B.G. (1990). The earliest relationship. Reading, MA: Addison-Wesley.

Brazelton, T.B., Koslowski, B., & Main, M. (1974). Origins of reciprocity. In M. Lewis & L. Rosenblum (Eds.), Mother–infant interaction. New York: John Wiley & Sons, p. 57-70.

Brooten, D., Gennaro, S., Brown, L., Butts, P., Gibbons, A., Bakewill-Sachs, S., & Kumar S. (1988). Anxiety, depression, and hostility in mothers of preterm infants. Nursing Research, 37, 213–216.

Bumberry, W., Oliver, J.M., & McClure, J.M. (1978). Validation of the Beck Depression Inventory in a university population. Journal of Consulting and Clinical Psychology, 46, 150–155.

Cohn, J.F., & Tronick, E.Z. (1983). Three months old infant's reaction to simulated maternal depression. Child Development, 54, 235–334.

Corter, C., & Minde, K. (1987). Impact of infant prematurity on family systems. In M. Wolraich (Ed.), Advances in developmental behavioral pediatrics (pp. 1–48). Greenwich, CT: JAI Press.

Crnic, K.A., Greenberg, M.T., Ragozin, A.S., Robinson, N.M., & Basham, R.B. (1983). Effects of stress and social support on mothers and premature and full term infants. Child Development, 54, 209–217.

Crockenberg S., & Leerkes E. (2000). Infant social and emotional development in family context. In C.H. Zeanah (Ed.), Handbook of infant mental health (pp. 67–68). New York: Guilford Press.

Davis, D.H., & Thoman, E.B. (1988). The early social environment of premature and fullterm infants. Early Human Development, 17(2–3), 221–232.

DeWolff, M.S., & van IJzendoorn, M.H. (1997). Sensitivity and attachment: A meta-analysis on parental antecedents of infant attachment. Child Development, 68, 571–591.

Feldman, R. (1998). Coding interactive behavior manual. Ramat-Gan, Israel: Bar-Ilan University.

Feldman, R. (2000). Parents' convergence on sharing and marital satisfaction, father involvement, and parent–child relationship at the transition to parenthood. Infant Mental Health Journal, 21, 176–191.

Feldman, R., & Eidelman, A.I. (1998). Intervention methods for premature infants: How and do they affect development. Clinics in Perinatology, 25, 613–626.

Feldman, R., Greenbaum, C.W., Mayes, L.C., & Erlich, H.S. (1997). Change in mother–infant interactive behavior: Relations to change in the mother, the infant, and the social context. Infant Behavior and Development, 20, 153–165.

Feldman, R., Masalha, S., & Nadam, R. (2001). Cultural perspective on work and family: Dual-earner Jewish and Arab families at the transition to parenthood. Journal of Family Psychology, 15.

Feldman, R., Weller, A., Eidelman, A.I., & Sirota, L. (2002). Skin-to-skin contact (Kangaroo Care) promotes self-regulation in premature infants: Sleep–wake cyclicity, arousal modulation, and sustained exploration. Developmental Psychology, 38(2).

Feldman, R., Weller, A., Leckman, J.F., Kvint, J., & Eidelman, A.I. (1999). The nature of the mother's tie to her infant: Maternal bonding under conditions of proximity, separation, and potential loss. Journal of Child Psychology and Psychiatry, 40, 929–940.

Fraiberg, S. (1982). Pathological defenses in infancy. The Psychoanalytical Quarterly, 4, 612–635.

Gauvain-Piquard, A., Rodary, Ch., Rezvani, A., & Lemerle, J. (1987). Pain in children aged 2–6 years: A new observational rating scale elaborated in a pediatric oncology unit. Pain, 31, 177–188.

Greenspan, S.I. (1992). Floor time: Engaging and interacting. In S.I. Greenspan (Ed.), Infancy and early childhood (pp. 460–461). Madison, CT: International Universities Press, Inc.

Guedeney, A. (2000). Infant depression and withdrawal: Clinical assessment. In J.D Osofsky & H.E. Fitzgerald (Eds.), WAIMH handbook of infant mental health (Vol. 4, pp. 455–484). New York: John Wiley & Sons.

Guedeney, A., & Fermanian, J. (2001). A validity and reliability study of assessment and screening for sustained withdrawal reaction in infancy: The Alarm Distress Baby Scale. Infant Mental Health Journal, 22(5), 559–575.

Hernandeiz-Reif, M., & Field, T. (2000). Preterm infants benefit from early interventions. In J.D. Osofsky & H.E. Fitzgerald (Eds.), WAIMH handbook of infant mental health (Vol. 4, pp. 297–325). New York: John Wiley & Sons.

Hesse E. (1999). The Adult Attachment Interview: Historical and current perspectives. In J. Cassidy & P.R. Shaver (Eds.), Hanbook of attachment, theory, research and clinical applications (pp. 395–433). New York: The Guilford Press.

International Neonatal Network. (1993). The CRIB (Clinical Risk Index for Babies) score: A tool for assessing initial neonatal risk and comparing performance of neonatal intensive care units. The Lancet, 342, 193–198.

Keren, M., Feldman, R., & Tyano, S. (2001). Diagnoses and interactive patterns of infants referred to a community-based infant mental health clinic. Journal of the American Academy of Child and Adolescent Psychiatry, 40(1), 27–35.

Leonard, B.J., Scott, S.A., & Erpestad, N. (1992). Maternal perception of first-born Infants: A controlled comparative study of mothers of premature and full-term Infants. Journal of Pediatric Nursing, 7(2), 90–96.

Lester, B.M. (1989). Infant behavior and physiological activity. Festschrift Symposium presentation in honor of T. Brazelton, M.D., November, Cambridge, MA.

Lester, B.M. (1992). Infants and their families at risk: Assessment and intervention. Infant Mental Health Journal, 13(1), 54–66.

Lester, B.M., Boukydis, C.F., Garcia-Coll, C.T., Peucker, M., McGrath, M.M., Vohr, B.R., Brem, F., & Oh, W. (1995). Developmental outcome as a function of the goodness of fit between the infant's cry characteristics and the mother's perception of her infant's cry. Pediatrics, 95(4), 516–521.

Lester, B.M., Boukydis, C.F.Z, McGrath, M., Censullo, M., Zahr, L., & Brazelton, T.B. (1990). Behavioral and psychophysiologic assessment of the preterm infant. In B.M. Lester & E. Tronick (Eds.), Clinics in perinatology. New York: Saunders.

Levy-Shiff, R., Sharir, H., & Mogilner, M. (1989). Mother and father preterm infant relationship in the hospital preterm nursery. Child Development, 60, 93–102.

Ludington, S.M., & Golant, S.K. (1993). Kangaroo care: The best you can do for your preterm infant. New York: Bantum Press.

Meyer, E.C., Coll, C.T., Lester, B.M., Boukydis, Z.C.F., McDonough, S.M., & Oh, W. (1994). Family-based intervention improves maternal psychological well-being and feeding, interaction of preterm infants. Pediatrics, 93(2), 241–246.

Meyer, E.C., Zeanah, C.H., Boukydis, Z.C.F., & Lester, B.M. (1993). A clinical interview for parents of high risk parents: Concept and applications. Infant Mental Health Journal, 14(3), 192–207.

Minde, K. (2000). Prematurity and serious medical conditions in infancy: Implications for development, behavior, and intervention. In C.H. Zeanah (Ed.), Handbook of infant mental health (pp. 176–194). New York: Guilford Press.

Minde, K., Goldberg, S., Perrotta, M., Washington, J., Lojkasek, M., Corter, C., & Parker, K. (1989). Continuities and discontinuities in the development of 64 very small premature infants to 4 years of age. Journal of Child Psychology and Psychiatry, 30, 391–304.

Minde, K., Marton, P., Manning, P., & Hines, B. (1980). Some determinants of mother–infant interaction in the premature nursery. Journal of the American Academy of Child Psychiatry, 19, 139–164.

Minde, K., Whitelaw, H., Brown, J., & Fitzhardinge, P. (1983). Effect of neonatal complications in premature infants on early parent–infant interaction. Developmental Medicine and Child Neurology, 25, 763–777.

Nover, A., Shore, M.F., Timberlake, E.M., & Greenspan, S.I. (1984). he relationship of maternal perception and maternal behavior: A study of normal mothers and their infants. American Journal of Orthopsychiatry, 54(2), 210–223.

Pederson, D.R., Jenkins, S., Evans, B., Chance, G.W., & Fox, A.M. (1985). Maternal response to the birth of a preterm infant. Presented as a poster at the Biennial Meeting of the Society for research in Child Development, Toronto, Ontario.

Polan, H.J., & Ward, M.J. (1994). Role of the mother's touch in failure to thrive: A preliminary investigation. Journal of the American Academy of Child Adolescent Psychiatry, 33(8), 1098–1105.

Sameroff, A.J., & Fiese, B.H. (1999). Transactional regulation: The developmental ecology of early intervention. In S.J. Meisels & J.P. Shonkoff (Eds.), Early intervention: A handbook of theory, practice, and analysis. New York: Cambridge University Press.

Sameroff, A.J. (2000). Ecological perspectives on developmental risk. In J.D. Osofsky & H.E. Fitzgerald (Eds.), WAIMH handbook of infant mental health (Vol. 4, pp. 3–33). New York: John Wiley & Sons.

Scheeringa, M.S., & Gaensbauer, T.J. (2000). Posttraumatic stress disorder. In C.H. Zeanah (Ed.), Handbook of infant mental health (pp. 369–381). New York: The Guilford Press.

Singer, S.T., Salvator, A., Guo, S., Collin, M., Lilien, L., & Baley, J. (1999). Maternal psychological distress and parenting stress after the birth of a very low-birth-weight infant. JAMA, 3, 281(9), 799–805.

Spielberger, C., Gorsuch, R.L., & Lushene, R.E. (1970). State-Trait Anxiety Scale. Palo Alto, CA: Consulting Psychologists Press.

Spitz, R.A. (1945). Hospitalism: An inquiry into the genesis of psychiatric conditions in early childhood. Psychoanalytic Study of the Child, 1, 53–74.

Stern, D.N. (1995). The motherhood constellation: A unified view of parent–infant psychotherapy (pp. 11–18). New York: Basic Books.

Stern, D.N., Burschweiler-Stern, N., & Freeland, A. (1998). The birth of a mother (pp. 165–183). Moshav Ben-Shemen, Israel: Modan Publishing House.

Teichman, Y., & Melnick, J. (1976). Hebrew adaptation of the State-Trait Anxiety Inventory. Tel Aviv: Tel Aviv University Press.

Tronick, E.Z., & Weinberg, M.K. (1997). Depressed mothers and infants: Failure to form dyadic states of consciousness. In L. Murray & P. Cooper (Eds.). Postpartum depression and child development (pp. 54–84). New York: The Guilford Press.

Weinberg, K.M., & Tronick, E.Z. (1994). Beyond the face: An empirical study of infant affective configurations of facial, vocal, gestural and regulatory behaviors. Child Developmental, 65(5), 1503–1515.

Zeanah, C.H., Boris, N.W., Bakshi, S., & Lieberman, A.F. (2000). Attachment disorders of infancy. In J.D. Osofsky & H.E. Fitzgerald (Eds.), WAIMH handbook of infant mental health (Vol. 4, pp. 93–122). New York : John Wiley & Sons.