

---

## SUSTAINED WITHDRAWAL BEHAVIOR IN CLINIC-REFERRED AND NONREFERRED INFANTS

---

**DAPHNA DOLLBERG**

*Bar-Ilan University and Geha Psychiatric Hospital, Israel*

**RUTH FELDMAN**

*Bar-Ilan University*

**MIRI KEREN**

*Geha Psychiatric Hospital and Tel-Aviv University*

**ANTOINE GUEDENEY**

*Hospital Bichat-Claude Bernard, AP/HP Paris*

**ABSTRACT:** To examine the relations between infants' sustained withdrawal behavior and children's mental health status and maternal and child relational behavior, 36 clinic-referred and 43 control infants were evaluated. Families were visited at home, mother-child free play and feeding interactions were videotaped, and mothers completed self-report measures. Interactions were coded for sustained withdrawal using the Alarm Distress Baby Scale (ADBB; Guedeney and Fermanian, 2001) and for global relational patterns with the Coding of Interactive Behavior (CIB; Feldman, 1998). Higher ADBB scores were found for the referred group, with many infants (38.9%) scoring above the clinical cutoff (vs. 11.6% in the control group). More negative relational patterns were found for the withdrawn group in terms of higher maternal intrusiveness, lower reciprocity, and lower child involvement. Associations were found between maternal and child behavior during play and feeding and child sustained withdrawal behavior at play. Sustained withdrawal also was associated with unpredictable child temperament and lower sense of parental self-efficacy. Maternal depressive symptoms were higher in the referred group and correlated with maternal and child relational patterns. The findings contribute to the construct and discriminant validity of the CIB and the ADBB coding systems, and suggest that sustained withdrawal may serve as a risk indicator for early socioemotional disorders.

**RESUMEN:** Con el fin de examinar las relaciones entre la sostenida conducta de desánimo de los infantes y el estado de salud mental de los niños con las conductas de relación entre madre e infante, se evaluaron 36 infantes clínicamente referidos y 43 infantes de un grupo de control. A las familias se les visitó en casa en donde se grabaron en vídeo las interacciones de juego libre y de alimentación entre la madre y su infante. Las madres también completaron medidas de auto-reporte. Las interacciones fueron codificadas en cuanto al desánimo sostenido usando la ADBB (Guedeney & Fermanian, 2001), y con

---

This study was supported by Dr. Mona Ackerman-Ricklis of the Ricklis Family Foundation. We thank Orna Gross-Rozval, Vered Bar-On, David Nisan, and Uri Gurevitz for their help in data collection and coding. Direct correspondence to: Daphna Dollberg, Department of Psychology, Bar-Ilan University, Ramat-Gan, Israel 52900; email: dollbed@mail.biu.ac.il.

respecto a los patrones globales de relación, la CIB (Feldman, 1998). Los más altos puntajes de ADBB se encontraron en el grupo clínicamente referido, en el que muchos infantes (38.9%) lograron un puntaje por encima del límite clínico. (comparados con el 11.6% en el grupo de control). Más patrones de relación negativos se encontraron en el grupo de infantes que mostraba conducta de desánimo en términos de más altos niveles de intervención maternal, más baja reciprocidad, y un más bajo involucramiento del infante. Se encontraron asociaciones entre la conducta maternal y la del niño durante el juego y la alimentación con la conducta de desánimo sostenido del niño en el juego. El desánimo sostenido también se asoció con el impredecible temperamento del infante y un más bajo sentido maternal de autoeficacia. Los síntomas de depresión maternal fueron mayores en el grupo clínicamente referido, y se correlacionaron con los patrones de relación de la madre y del niño. Los resultados contribuyen a la validez de construcción y de discriminación de los sistemas de codificación de CIB y de ADBB, y sugieren que el desánimo sostenido puede servir como un indicador de riesgo para los casos de trastornos socio-emocionales a edad temprana.

**RÉSUMÉ:** Pour examiner les relations entre le comportement de retrait prolongé des nourrissons et le statut de santé mentale des enfants, le comportement relationnel maternel, et celui de l'enfant, 36 nourrissons en consultation et 43 nourrissons de contrôle ont été évalués. Les familles ont reçu des visites à domicile, le jeu libre mère-enfant et les interactions de prises de nourriture ont été filmés à la vidéo, et les mères ont complété des mesures auto-évaluatives. Les interactions ont été codées pour le retrait prolongé en utilisant l'échelle Alarme Détresse Bébé ADBB (Guedeney & Fermanian, 2001) et pour des patterns relationnels globaux avec le CIB (Feldman, 1998). Des cotations plus élevées ADBB ont été trouvées pour le groupe en consultation, avec beaucoup de nourrissons (38,9%) au dessus de la limite clinique (comparé à 11,6% dans le groupe de contrôle). Plus de patterns relationnels négatifs ont été trouvés pour le groupe de retrait en termes d'intrusion maternelle plus élevée, d'une réciprocité amoindrie, et un engagement de l'enfant plus faible. Des associations ont été trouvées entre le comportement maternel et le comportement de l'enfant durant le jeu et la prise de nourriture et le comportement de retrait prolongé de l'enfant pendant le jeu. Le retrait prolongé a aussi été lié au tempérament imprévisible de l'enfant et à un sens d'auto-efficacité parental plus bas. Les symptômes dépressifs maternels étaient plus élevés dans le groupe en consultation et liés aux patterns relationnels maternels et de l'enfant. Les résultats contribuent au concept et à la validité du CIB et des systèmes de cotation ADBB, et suggèrent que le retrait prolongé sert d'indicateur de risque pour des troubles socio-émotionnels précoces.

**ZUSAMMENFASSUNG:** 36 an die Ambulanz überwiesene und 43 Kinder einer Kontrollgruppe wurden untersucht, um die Beziehung zwischen dem nachhaltigen Rückzugsverhalten des Kindes und der geistigen Entwicklung, sowie dem Beziehungsverhalten von Mutter und Kind zu bestimmen. Die Familien wurden zu Hause besucht, freies Mutter – Kind Spiel und eine Fütterungssituation wurden mittels Video dokumentiert und die Mütter füllten einen Fragebogen aus. Die Interaktionen wurden im Bezug auf dauerhaften Rückzug mittels des ADBB (Guedeney & Fermanian 2001) und im Bezug auf generelle Beziehungsmuster mittels des CIB (Feldman 1998) kodiert. Höhere ADBB Werte wurden in der überwiesenen Gruppe gefunden, bei der viele Kinder (38,9%) über der Grenze der statistisch ermittelten klinisch auffälligen Gruppe lagen (im Vergleich waren 11,6% der Kontrollgruppe jenseits dieser Marke). Mehr negative Beziehungsmuster wurden bei der Gruppe der sich zurückziehenden Kinder gefunden und zwar im Bezug auf mehr mütterliche Übergriffe, geringeres Ausmaß an stimmiger Reaktion und einer geringeren Anteilnahme des Kindes. Zusammenhänge wurden gefunden zwischen dem mütterlichen und kindlichen Verhalten während des Spiels und Essens und dem dauerhaftem Rückzugsverhalten während des Spiels. Dauerhafter Rückzug war auch mit unvorhersehbarem kindlichen Temperament und einer geringeren Selbsteinschätzung der Eltern bezüglich ihrer Fähigkeiten assoziiert. Depressive Symptome der Mütter waren vermehrt in der überwiesenen Gruppe und korrelierten mit mütterlichen und kindlichen Beziehungsmustern. Diese Ergebnisse stellen einen Beitrag zu der Konstrukt- und der Dis-

kriminationsvalidität des CIB und des ADBB Kodierungssystem dar und weisen darauf hin, dass dauerhafter Rückzug als ein Risikofaktor für frühe sozio-emotionale Störungen angesehen werden kann.

抄録：乳児の持続的な引きこもり行動と、子どもの精神保健の状態と、母親と子どもの関係性行動との間の関係を検証するために、36人の臨床に紹介された乳児と、43人の対照乳児が評価された。家族は家庭訪問され、母親と子どもの自由遊びと食事場面の相互交流がビデオ撮影され、そして母親は自己報告式の質問紙のすべての項目に記入した。相互交流は、ADBB (Guedeney & Fermanian, 2001)を用いて持続的な引きこもりについて、そしてCIB (Feldman, 1998)を用いて全般的な関係のパターンについてコード化された。高いADBBスコアは、紹介群に見られ、多くの乳児(38.9%)は、臨床的なカットオフ点を超えていた(対照群の11.6%と比較して)。より高い母親の侵入性、より低い相互性、そしてより低い子どもの関与に関して、より否定的な関係性パターンが引きこもり群に見られた。遊びと食事場面での母親と子どもの行動と、遊びでの子どもの持続的な引きこもり行動との間に関連が見られた。持続的な引きこもりはまた、予測できない子どもの気質とより低い親の自己効力感とも関連していた。母親の抑うつ症状は紹介群に高く、母親と子どもの関係パターンと相関していた。所見はCIBとADBBコード化システムの構成妥当性と判別妥当性に貢献し、持続的な引きこもりは早期の社会感情障害へのリスク指標として役立つかも知れないことを示唆する。

\* \* \*

Developmental psychology has taught us that infants are social creatures, actively seeking interactions and contact, both physically and psychologically, with their environment (Fogel, 1993). Nevertheless, microanalytic studies have shown that brief episodes of infant withdrawal appear frequently during mother–infant interactions (Beebe, Lachmann, & Jaffe, 1997; Brazelton, Koslowski, & Main, 1974; Weinberg & Tronick, 1994), playing an important role in the regulation of early interactions (Brazelton & Cramer, 1990). In contrast to brief moments of withdrawal, sustained withdrawal behavior in infancy is significantly less common and is associated with severe pathological conditions (Guedeney & Fermanian, 2001) such as autism, pervasive developmental disorders, infant depression (Guedeney, 1997, 2000), or severe and chronic pain (Gauvain-Piquard, Rodary, Rezvani, & Sebouti, 1999). In addition, severe withdrawal is often observed in infants suffering from anxiety disorders, posttraumatic stress disorder, or infants displaying insecure and disorganized attachments (Beebe, 2000; Salomon & George, 1999; Zeanah, 1993). However, the transactional model of mother–child interaction (Sameroff & Fiese, 1990) as well as findings from animal studies (Polan & Hofer, 1999; Suomi, 1999) have suggested that infant behavior is multidetermined, shaped by specific features within the infant, the caregiver, and the environment. The goal of the present study is to examine the prevalence of child sustained withdrawal behavior among infants and

young children in less severe conditions as well as to examine the contribution of specific risk factors associated with the child, the mother, and the environment to the emergence of sustained withdrawal behavior.

Observations of young children separated from their caregivers led Robertson and Bowlby (1952) to describe a three-stage emotional reaction in young children, comprising of protest, despair, and eventually detachment in the face of prolonged separation. The gradual decline in attachment behavior was attributed to a defensive maneuver that protects the child from experiencing the unbearable mental pain caused by the absence of maternal care and the break of the affective bond (Ainsworth & Bowlby, 1991). Along these lines, sustained withdrawal behavior may be viewed as a chronic diminution of the attachment system, which is gradually generalized into a diminished engagement and lowered reactivity to the environment at large.

From a different theoretical perspective, Engel and Schmale (1972) argued that the organism is equipped with a biological threshold mechanism, termed the Conservation-Withdrawal Threshold. This mechanism allows the system, under certain severe conditions, to disengage vis-à-vis the external environment in the service of conserving energy and assuring the organism's survival.

From yet another perspective, studies in animal models have described somewhat similar, albeit species-specific, reactions of both excitatory and inhibitory regulatory processes among mammal pups separated from their mothers (for review, see Hofer, 1996b; Polan & Hofer, 1999; Suomi, 1999). In a series of controlled experiments, Hofer and colleagues (Hofer, 1996a, 1996b; Hofer, Brunelli, Masmela, & Shair, 1996) showed how contextual variables such as dam's behavior and responsiveness, duration and quality of previous contact, contact with littermates, and presence of a predator shape the pup's inhibitory or excitatory responses. Specifically, active maternal-care behavior prior to separation led to an increase in pups' ultrasonic vocalization during separations (analogous to human infant's protest) while contact with an unresponsive, anesthetized mother led to rapid decline in vocalization during subsequent separations (analogous to detachment). The researchers concluded that animals are equipped with complex regulatory systems responsive to internal and contextual cues, which determine their response pattern based on the likelihood of eliciting maternal response or avoiding danger. These findings highlight the value of examining sustained withdrawal behavior in children in relation to contextual variables such as maternal behavior, child characteristics, and environmental risks.

Little research has addressed the specific maternal behaviors associated with child withdrawal. The attachment literature has demonstrated that withdrawal behavior is common among insecure-avoidant children (Ainsworth, Blehar, Waters, & Wall, 1978). Mothers of avoidant children have been described as intrusive, controlling, and rejecting of their infants' overtures for closeness (Ainsworth et al., 1978; Cassidy & Berlin, 1994). A recent study found that maternal facial and motor responsiveness predicted social withdrawal in older children (Gerhold, Laucht, Texdorf, Schmidt, & Esser, 2002). However, to the best of our knowledge, the specific maternal behaviors associated with infant sustained withdrawal in and of itself have not been examined. The present study examined whether higher levels of child withdrawal behavior are associated with less sensitive, more intrusive, and more controlling maternal behavior.

Withdrawal reaction has been described as frequent among children of depressed mothers (Field, 1984). Depressed mothers typically exhibit lower levels of sensitivity and availability

(Field, 1995; Seifer, Sameroff, Anagnostopolou, & Elias, 1992), and thus children may be more inclined to defensively detach themselves from the mother. However, current findings challenge the traditional view of the direct effect of maternal depression on child development, suggesting instead a bidirectional stress model in which maternal depression affects the quality of parenting and hence compromises the child's social and interpersonal competencies, which in turn further exacerbate maternal depression (Hammen, Shih, & Brennan, 2004). In light of this model, we examined the relations between maternal depressive symptoms, child psychopathology, interactive behavior, and sustained withdrawal behavior in young children.

Parental sense of competence and satisfaction (Johnston & Mash, 1989) may similarly affect and be affected by the parent-child relationship. Maternal sense of self-efficacy was found to predict more optimal parent-child and family interactions in infancy (Feldman, Weller, Sirota, & Eidelman, 2003). Thus, maternal efficacy and satisfaction may affect and be affected by the child's sustained withdrawal behavior. Reoccurring, frequent withdrawal may be perceived by mothers as expressions of the child's anger, distance, or lack of love or need for them, therefore reflecting on their parenting competence and efficacy. This, in turn, may influence their future motivation to engage with the child (Bandura, 1982), thus leading into a negative, vicious circle of reciprocal and mutual withdrawal and avoidance. It was therefore hypothesized that higher levels of sustained withdrawal behavior will be associated with lower parenting sense of efficacy.

Child temperament is also an important contributor to the mother-infant relationship and to the child's socioemotional development (e.g., Crockenberg & Smith, 1982; Lee & Bates, 1985; Rutter & Quinton, 1984); however, to our knowledge, the relationship between child temperament and sustained withdrawal behavior has not been studied. Clinical observations from our community-based infant mental health clinic have suggested that withdrawal may be more prevalent among infants who are less adept and flexible, experiencing stress under conditions of change and novelty and therefore using defensive maneuvers such as withdrawal more extensively. Consequently, we examined the links between maternal perception of child temperament and sustained withdrawal behavior.

Several studies have shown that interactions between clinic-referred infants and their mothers are generally less optimal than those of nonreferred controls. For example, Campbell et al. (1986) found that mothers of toddlers referred for disruptive behavior were more controlling and directed more negative statements toward their children as compared to nonreferred controls. Crowell, Feldman, and Ginsberg (1988) reported that mothers of preschoolers referred for behavior problems were less supportive during play interaction compared to mothers of similar-aged, nonreferred children matched in sociodemographic factors. Our own observations of clinic-referred mother-infant dyads have shown that these dyads tended to show less optimal interactive behavior as compared to controls (Feldman & Keren, 2004; Feldman, Keren, Gross-Rozval, & Tyano, 2004; Keren, Feldman, & Tyano, 2001). Specifically, mothers of referred infants were less supportive and provided less structure during free play. Interactions were characterized by lower levels of reciprocity and higher levels of joint negativity. During feeding, a similar pattern of disharmonious interaction emerged with the addition of increased infant withdrawal in the referred group. Taken together, these findings suggest that feeding was a more stressful situation for both infant and parent and thus elicited

more conflictual behaviors. In light of these findings, we examined play and feeding behavior among clinic-referred and nonreferred infants and assessed whether the clinic-referred group demonstrated higher levels of withdrawal behavior.

To date, there have been no research tools designed specifically for the assessment of withdrawal behavior in infants and young children. The Alarm Distress Baby Scale (ADBB; Guedeney & Fermanian, 2001) is a relatively new scale designed to assess sustained withdrawal reaction in infants. The ADBB was initially designed to accompany well-baby medical examinations as well as other structured situations such as developmental testing, face-to-face assessments, and screening procedures for detecting infants who are at high developmental risk. In the present study, the ADBB was used to assess child withdrawal behavior during mother-child free-play interaction. It was hypothesized that sustained withdrawal behavior will be more prevalent among clinic-referred infants compared to nonreferred infants. We also hypothesized that higher infant sustained withdrawal behavior will be associated with less optimal maternal and child interactive behavior in terms of lower maternal sensitivity and structuring of the interaction, increased maternal intrusiveness, reduced child social engagement, and diminished dyadic reciprocity during free-play and feeding interactions. Furthermore, higher sustained withdrawal was expected among children of mothers who report higher levels of depressive symptomatology and lower parental sense of competence and efficacy. An association also was expected between sustained withdrawal and features of child temperament. Finally, child sustained withdrawal scores during free play were expected to correlate with dimensions of mother's and child's interactive behavior during free play and it was expected that feeding assessed independently. Thus, maternal sensitivity and structuring of the interaction, child involvement and compliance, and dyadic reciprocity will correlate negatively with infant withdrawal whereas maternal intrusiveness will be positively associated with infant sustained withdrawal.

## I. METHOD

### A. Subjects

Seventy-nine infants and toddlers and their mothers participated in the study. The sample consisted of 36 infants referred to an infant mental health clinic (referred group) and 43 nonreferred infants (control group). Both groups were recruited from well-baby care clinics spread around an urban center in Israel. The referred group was comprised of infants who were screened and referred for treatment in an infant mental health clinic by nurses trained to observe and identify socioemotional difficulties in infants and disturbed parent-child relations (for a detailed description of the training process, see Keren et al., 2001). Common complaints included sleeping, eating, and crying difficulties as well as problems in parenting or difficulty in attachment. Infants with significant developmental delays or physical disabilities were excluded from the study. Getting treatment was not conditional for participation in the study. The control group was comprised of well-baby clinic infants with no known developmental or emotional problems. The sample consisted of 59 boys (26 in the referred group, 33 in the control group) and 20 girls (10 in the referred group, 10 in the control group) ranging in age from 7 to 36 months ( $M=24$ ). No differences between groups were found in age, sex, or demographic characteristics (see Table 1). Children in the referred group were diagnosed

**TABLE 1.** Comparison of Demographic Variables in Referred and Nonreferred Infants

	Referred		Nonreferred	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Child age (months)	23.61	7.64	24.28	8.14
Maternal age (years)	31.29	5.03	30.85	5.39
Maternal education <sup>a</sup>	2.90	1.14	3.41	1.07
Sex				
Male	26		33	
Female	10		10	
Birth order				
First-born	24		15	
Later born	10		8	
Unknown	2		20	

<sup>a</sup>Maternal education: 1= no high-school diploma; 2= high-school diploma; 3= post- high-school vocational diploma; 4= bachelor's degree and above.

with the Diagnostic Classification of Mental Health and Developmental Disorders of Infancy and Early Childhood (DC 0–3; Zero to Three, 1994) by the mental health clinic staff. Eighty-one percent of the referred group had Axis I diagnosis, including (in descending order) eating, sleep, anxiety, mixed disorder of emotional expressiveness, regulatory, traumatic stress, and multisystem developmental disorders (see Table 2).

### **B. Procedure**

The socioemotional status of the referred infants was assessed at the infant mental health clinic, and mothers were notified about a future home visit to be set at their convenience by the research team. The control-group dyads were contacted by telephone to set a time for the home visit. During this conversation, control families were asked about the social-emotional

**TABLE 2.** Distribution of DC 0–3 Axis I Diagnosis in the Referred Group

	<i>n</i>	%
Eating disorder	15	42
Sleep disorder	6	17
Anxiety disorder	2	6
Mixed disorder of emotional responsiveness	2	6
Regulatory disorder	2	6
Traumatic stress disorder	1	3
Multisystem developmental disorder	1	3
No classification	7 <sup>a</sup>	19

<sup>a</sup>This includes 4 cases (11%) for which diagnosis was missing.

history of their infants, and children presenting with significant developmental and/or family problems were screened out (for screening information, see Feldman et al., 2004).

Families were videotaped at their home by a trained research assistant, blind to the family's group membership, for a 10-min free-play interaction and a 10-min feeding interaction (counterbalanced for order). After the videotaping, mothers were asked to complete a battery of self-report questionnaires (discussed next). The videotapes and questionnaires were then transferred to a central university laboratory for scoring and coding by coders who were blind to the infant's group membership.

### C. Measures

1. *Demographic Questionnaire*. Parents provided demographic information regarding their age, education, monthly income, family composition, and the child's brief developmental history.

2. *Beck Depression Inventory (BDI; Beck, 1978)*. The BDI was used to assess depressive symptoms in the mothers. It includes 21 items that measure the level of depressive symptoms on a 3-point scale. Higher scores indicate a higher level of depressive symptomatology. The BDI is a widely used self-report instrument with well-established reliability and validity (Bumberry, Oliver, & McClure, 1978).

3. *Infant Characteristics Questionnaire (ICQ; Bates, Freeland, & Lounsbury, 1979)*. The ICQ was utilized to measure maternal perception of infant temperament. The instrument consists of 24 items rated on a 9-point scale and yields four factors: Fussy-Difficult, Unadaptable, Dull, and Unpredictable. On each subscale a higher score indicates a higher level of difficulty. Means (and *SDs*) for the four factors were 21.57 (8.54) for Fussy-Difficult, 13.51 (5.94) for Unadaptable, 8.35 (3.38) for Dull, and 8.66 (3.87) for Unpredictable. Intercorrelations between the factors ranged from  $-.01$  to  $.38$ , averaging  $.15$ .

4. *Parental Scale of Competence and Satisfaction (PSCS; Johnston & Mash, 1989)*. The PSCS was used to assess maternal sense of competence and efficacy. The PSCS is a 17-item self-report scale assessing the level of the parent's frustration, anxiety, motivation, sense of competence, problem-solving efficacy, and resourcefulness as a parent. It yields two factors, Competence-Efficacy and Satisfaction, with higher scores indicating higher levels of efficacy and satisfaction. The scale is reported to have acceptable reliability and validity (Johnston & Mash, 1989).

## II. CODING

Two independent teams of coders, blind to the infant's group membership, coded the videotaped mother-infant interactions:

### 1. *Infant Sustained Withdrawal*

The ADBB (Guedeny & Fermanian, 2001) was used to assess infant's sustained withdrawal behavior during free play. The ADBB is an eight-item scale designed initially for use with infants aged 2 to 24 months undergoing a medical examination in a well-baby clinic.

Previous research with a community-based well-baby clinic population has shown that the scale is adequately reliable and valid, yielding high correlation between raters and correlating highly with other measures of infant withdrawal.

A training program was set prior to actual coding. Two graduate students coded training tapes designed by the author, not allowing discrepancies above 1 point per item and .85 agreement for total score. After reaching the required reliability level, several minor changes were made to adapt the scale to the use of nonparticipant observers. The item designed to assess the child's reaction to an unfamiliar adult was excluded, as only mother and child participated in the interaction. The Attraction subscale was changed to address the effort required of the mother to attract the child's attention and the amount of observed pleasure she appears to derive from the interaction. Also, because our sample included toddlers as well as infants, the definition of the Eye Contact subscale was broadened to include all times when the child initiated and maintained eye contact and joint attention with the mother. The other scales remained unchanged, including the infant's facial expression, rate and quality (positive vs. negative) of vocalization, general level of activity, self-stimulating gestures, and briskness of response to stimulation. With all items, low scores indicated low rates of withdrawal while high scores indicated high rates of withdrawal behavior. Reliability was conducted on 20 tapes and reached intraclass  $r=.91$ . Internal consistency of the entire scale for the present sample was .75. A cutoff score of 5 with a sensitivity of 0.82 and a specificity of 0.78 was determined to be optimal for screening purposes by the authors in a well-baby clinic population (Guedeney & Fermanian, 2001).

## 2. Mother–Child Interactive Behavior

The CIB (Feldman, 1998) was used to assess the quality of the mother–child interaction. This 42-item global coding scale yields scores for mother, infant, and the dyad. The scale yields eight theoretically derived composites that touch on diverse aspects of mother–child interaction and show high levels of internal consistency (Feldman, 2000; Feldman, Eidelman, & Rotenberg, 2004; Feldman, Eidelman, Sirota, & Weller, 2002; Feldman, Greenbaum, Mayes, & Erlich, 1997; Feldman & Klein, 2003; Feldman, Masalha, & Nadam, 2001; Feldman et al., 2003). The CIB has been used with a variety of populations and was found to be sensitive to differences in child age, parent sex, cultural differences, interactive partner, and biological and social-emotional risk conditions. Composites for the present study included Maternal Sensitivity (internal consistency =.94), Maternal Intrusiveness (.87), Maternal Structuring of the Environment (.90), Child Involvement (.88), Child Compliance (.82), Child Withdrawal (.83), and Dyadic Reciprocity (.92). Reliability was conducted on 20 mother–infant interactions and averaged 93% (range =87–96%). Kappa averaged .81 (range =.73–.87).

## III. RESULTS

To test whether sustained withdrawal behavior was more prevalent among clinic-referred infants, mean ADBB scores of the referred and nonreferred groups were compared using a  $t$  test. The results showed a significant mean difference between the two groups,  $t(77)=-3.43$ ,  $p<.01$ , with the referred group scoring higher ( $M=4.39$ ,  $SD=4.07$ ) on the ADBB compared to the nonreferred control group ( $M=1.86$ ,  $SD=2.40$ ). Next, the cutoff score of 5 was applied,

**TABLE 3.** Comparison of Play CIB in Withdrawn and Nonwithdrawn Infants

Subscale	Withdrawn (n=19)		Nonwithdrawn (n=60)		F
	M	SD	M	SD	
Maternal Sensitivity	3.49	1.14	4.03	.93	3.69*
Maternal Structuring	4.24	.92	4.52	.67	ns
Maternal Intrusiveness	1.63	.83	1.67	.72	ns
Child Withdrawal	2.63	3.22	1.09	.36	11.85***
Child Involvement	2.94	.79	3.94	.79	22.51****
Child Compliance	2.60	.73	3.22	.95	6.31**
Dyadic Reciprocity	3.03	1.11	3.91	1.10	7.33***

Note. CIB= Coding of Interactive Behavior; ns= not significant.  
\* $p < .06$ . \*\* $p < .05$ . \*\*\* $p < .01$ . \*\*\*\* $p < .001$ .

differentiating between clinically withdrawn ( $n=19$ ) and nonwithdrawn ( $n=60$ ) infants. The prevalence of clinically withdrawn status in the two groups was compared, showing a significant tendency of the referred-group infants (38.9 vs. 11.6% in the control group) to score in the clinically withdrawn range,  $\chi^2(1, 79)=7.97, p < .01$ . Finally, to examine whether sustained withdrawal is associated with a specific diagnostic category, the distribution of clinically withdrawn and nonwithdrawn children among the different diagnostic categories was examined. The analysis revealed no association between sustained withdrawal and any one category,  $\chi^2=5.51, ns$ .

In the next step, we examined whether the two groups, clinically withdrawn and nonwithdrawn infants, differed on their CIB scores during play and feeding. These analyses evaluated whether the interactive behavior of the clinically withdrawn infants and their mothers, as a group, was qualitatively different from that of the nonwithdrawn group. Both free-play and feeding CIB scores were used to validate the findings in two separate interactive settings. Two MANOVAs were carried out, comparing the CIB scores of the two groups. Results showed that during play (Table 3), the nonwithdrawn group scored higher on Child Involvement, Child Compliance, Dyadic Reciprocity, and had lower scores for Child Withdrawal. A marginal effect was found for Maternal Sensitivity. During feeding (Table 4), the nonwithdrawn group scored higher on Child Involvement and Dyadic Reciprocity and lower on Child Withdrawal and Maternal Intrusiveness. In summary, maternal intrusiveness, child involvement, dyadic reciprocity, and to some degree sensitivity differentiated the play and feeding of the withdrawn and nonwithdrawn children.

To test whether sustained withdrawal was associated with the mother's self-reported depressive symptoms, a Pearson correlation was conducted between the ADBB and the BDI. A correlation of  $r=.07, ns$ , was found, indicating no significant association between the two measures. The association between the BDI and the CIB composite subscales also was examined. Results showed that during play, Child Compliance correlated significantly with the BDI ( $r=-.29, p < .05$ ). During feeding, Dyadic Reciprocity was associated with lower depression ( $r=-.26, p=.05$ ), and Child Withdrawal was marginally correlated with maternal BDI scores ( $r=.24, p=.07$ ). Mothers in the referred group reported significantly higher levels

**TABLE 4.** Comparison of Feeding CIB in Withdrawn and Nonwithdrawn Infants

Subscale	Withdrawn (n=19)		Nonwithdrawn (n=60)		F
	M	SD	M	SD	
Maternal Sensitivity	3.71	1.04	3.43	1.14	ns
Maternal Structuring	4.25	.90	4.26	.92	ns
Maternal Intrusiveness	3.56	1.01	2.89	1.16	4.98*
Child Withdrawal	1.93	.90	1.46	.77	4.63*
Child Involvement	2.16	.96	3.27	1.08	10.93**
Child Compliance	2.40	.89	2.43	.84	ns
Dyadic Reciprocity	2.80	.96	3.61	.96	4.47*

Note. CIB= Coding of Interactive Behavior; ns= not significant.  
\* $p < .05$ . \*\* $p < .01$ .

of depressive symptomatology ( $M=12.91$ ,  $SD=8.35$ ), as compared to the control group ( $M=5.32$ ,  $SD=4.97$ ),  $t=-4.39$ ,  $p < .001$ . Finally, the CIB scoring system includes a measure of observed maternal depressed behavior (consisting of sad affect, apathy, decreased energy, and lack of eye contact), which is not included in the composite subscales. To further examine the relationship between maternal depression and child withdrawal, the association between the observed depressive behavior scores, the BDI, and the ADBB scores was examined. The results indicated a significant positive correlation between maternal depressed behavior during feeding and ADBB scores ( $r=.23$ ,  $p < .05$ ) as well as between depressed behavior during play and ADBB ( $r=.22$ ,  $p < .05$ ). No significant correlation was found between depressed behavior and the BDI.

To test whether infant sustained withdrawal behavior was associated with parenting sense of satisfaction and efficacy, the correlation between ADBB and PSCS scores was tested, showing a significant inverse correlation ( $r=-.47$ ,  $p < .01$ ) between parental sense of efficacy and infant sustained withdrawal. Next, the association between infant withdrawal and temperament was tested by examining the correlation between ADBB and the ICQ subscales. The results indicated a significant positive correlation ( $r=.45$ ,  $p < .01$ ) between ADBB and the Unpredictability subscale of the ICQ, indicating that children perceived by their mothers as unpredictable tend to be more withdrawn.

Finally, the association between the ADBB and the CIB scoring systems was examined. Results are presented separately for free play and feeding in Tables 5 and 6. As seen in Table 5, Child Involvement, Child Compliance, Dyadic Reciprocity, and Maternal Sensitivity, correlated negatively with ADBB during play while child Withdrawal correlated positively with ADBB. No significant correlation was found between Maternal Intrusiveness and ADBB during play. During feeding (Table 6), Child Involvement and Dyadic Reciprocity correlated negatively with the ADBB, and Maternal Intrusiveness and Child Withdrawal correlated positively with the ADBB score. Cross-setting stability between CIB feeding and free-play scores ranged between .35 and .60.

**TABLE 5.** Correlations of Play CIB Subscales and Sustained Withdrawal Score (ADBB)

<i>Subscale</i>	<i>ADBB Score</i>
Maternal Sensitivity	-.23**
Maternal Structuring	-.20*
Maternal Intrusiveness	-.03
Child Withdrawal	.28**
Child Involvement	-.45***
Child Compliance	-.29***
Dyadic Reciprocity	-.29***

Note. CIB= Coding of Interactive Behavior; ns= not significant.

\* $p < .07$ . \*\* $p < .05$ . \*\*\* $p < .01$ .

#### IV. DISCUSSION

The present study examined infant sustained withdrawal behavior in a sample of clinic-referred and nonreferred infants and toddlers. As hypothesized, sustained withdrawal behavior was more prevalent and more severe among clinic-referred infants, with many of them scoring above the clinical cutoff. These findings indicate that sustained withdrawal behavior, as measured by the ADBB, is a valid screening measure for at-risk infants. Infants in the referred group were independently identified by trained nurses to be at risk for socioemotional and relational difficulties, and the data suggest that these infants demonstrate more maladaptive social behavior as assessed by observers who were blind to their clinical status. Furthermore, sustained withdrawal was equally distributed among the different diagnostic categories, suggesting that it is a nonspecific pathological behavior rather than a disorder-specific characteristic, and may thus serve as a useful target behavior for screening purposes. Nevertheless, because the clinic-referred sample included toddlers with a variety of disorders, these findings need to be replicated with larger samples or samples with specific disorders.

The main goal of this study was to understand the conditions and mechanisms associated with infant sustained withdrawal. Although withdrawal is a frequently observed phenomenon in clinical settings, it has rarely been subjected to empirical investigations, and little informa-

**TABLE 6.** Correlations of Feeding CIB Subscales and Sustained Withdrawal Score (ADBB)

<i>Subscale</i>	<i>ADBB Score</i>
Maternal Sensitivity	.05
Maternal Structuring	-.05
Maternal Intrusiveness	.25*
Child Withdrawal	.35**
Child Involvement	-.48***
Child Compliance	-.04
Dyadic Reciprocity	-.38***

Note. CIB= Coding of Interactive Behavior.

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

tion is available on its prevalence and origins. Consistent with a transactional perspective (Sameroff & Fiese, 1990), we examined both infant and maternal characteristics. Regarding maternal factors, the findings show that interactive behavior marked by depressed mood, negative facial expressions, and apathy, decreased sense of parental efficacy, and impaired interactive behavior in terms of lower sensitivity and heightened intrusiveness were associated with increased sustained withdrawal behavior in infants and toddlers. Regarding child characteristics, unpredictable temperament and lower social involvement were associated with a tendency to rely on sustained withdrawal in dealing with the social environment. Taken together, these findings provide an empirical support, albeit correlational, for a clinically inspired and theoretically based model which postulates that sustained withdrawal behavior in young children is a reaction to perceived impaired parental care. Sustained withdrawal behavior has its roots in the organism's evolutionary, biological-temperamental repertoire, as evidenced from animal studies. Under certain contextual circumstance, the natural mechanism of brief withdrawal may lead the way to the development of a defensive pathological strategy of sustained withdrawal, which acts against the infant's natural tendency to reach out to the social environment. Our findings suggest that some dyads are more prone to turning normal infant withdrawal reaction into a pathological defensive strategy of sustained withdrawal. In these dyads, the brief, transient, and normative form of infant withdrawal may be misperceived by the mother who, due to a low sense of parental satisfaction and efficacy and difficulties in predicting the child's acts (as reflected by perceiving the child as unpredictable on the temperament measure), tends to respond to it by heightened intrusiveness, especially under more stressful situations such as feeding. This intrusiveness is likely to be experienced by the child as threatening, frightening, and/or enraging, thus expanding the child's tendency to withdraw. Gradually, as these negative transactions repeat themselves, the use of withdrawal as a coping mechanism becomes entrenched, and may develop into the child's preferred defense strategy in dealing with the environment. A vicious circle emerges in which the more withdrawn the child is, the more anxious and intrusive the mother becomes and vice versa. To support this model, more developmental research is needed in which mother-child interactions are observed during infancy and toddlerhood and infant withdrawal behavior is assessed over time. Furthermore, it also is important to assess the infant's withdrawal behavior with other adults such as the father and/or a stranger and to evaluate when and under what conditions sustained withdrawal is generalized beyond the mother-child system, thus becoming a defensive strategy used with the social environment at large.

A link has been suggested between maternal depression and child sustained withdrawal (Matthey, Guedeney, Starakis, & Barnett, 2005). In the present study, we found no correlation between sustained withdrawal behavior in children, as measured by the ADBB, and the level of maternal self-reported depressive symptomatology. Nevertheless, as expected, depressive symptomatology was higher among clinic-referred mothers and was associated to some degree with less optimal mother-child interactive behavior in terms of reduced child compliance and dyadic reciprocity. Furthermore, observations of the mothers revealed an association between maternal depressed behavior, expressed as sad affect, reduced energy, apathy and gaze aversion, and child withdrawal behavior, as measured by the ADBB. No association was found between maternal depressed behavior and maternal reported depressive symptomatology. Taken together, these results add to a growing body of evidence (e.g., Murray, Fiori-Cowley, Hooper, & Cooper, 1996; Stanley, Murray, & Stein, 2004) which has suggested that depression, per se, does not interfere directly with the infant's development but rather that

maternal depressed behavior, expressed as dominance of negative affect, apathy, and parental withdrawal, may impinge on optimal parenting, which in turn has a negative impact on the child's development. As children are repeatedly faced with a withdrawn, unresponsive, angry, and potentially depressed mother, they may tend to withdraw from interacting with her and gradually rely more extensively on withdrawal as a way of dealing with their social environment. Clinically, these findings point to the importance of including observations of mother-child interactions in screening procedures of high-risk dyads, in addition to maternal-survey reports.

Data in the current study were assessed with two independent coding systems. Examining the association between the two systems revealed some interesting correlations, which contribute to the psychometric properties of the two coding systems as well as to our theoretical and clinical understanding of infant withdrawal behavior. First, sustained withdrawal, as measured by the ADBB, correlated positively with the CIB Child Withdrawal subscale on both the feeding and play interactions, thus providing further support for the two scales' concurrent validity. Second, both the ADBB and the CIB subscales successfully discriminated clinic-referred from nonreferred dyads, thus contributing to the systems' discriminant validity. Finally, the ADBB sustained withdrawal score was negatively associated with maternal sensitivity, child involvement, child compliance, and dyadic reciprocity, and positively associated with maternal intrusiveness. These data support the theoretically based hypothesis that increased sustained withdrawal is associated with less optimal interactive patterns, thus enhancing the measure's construct validity.

Infants in the nonreferred control group were screened by trained well-baby-care nurses, based on the mother's report and the nurse's observation; however, these infants were not examined by a mental health professional. Thus, a possible caveat of the present study is that some of the infants in the control group were suffering from undetected socioemotional difficulties. Nevertheless, the fact that infants in the nonreferred group were found to present with fewer maladaptive behaviors on both the ADBB and the CIB scales suggests that these infants demonstrate better social-emotional adjustment, either due to a better make-up or a more supportive environment.

The present study utilized a clinical sample with some unique characteristics. Eighty-one percent of the referred children met criteria for DC 0-3 Axis I diagnosis, which is consistent with findings from other infant clinic samples (e.g., Emde & Wise, 2003; Frankel, Boyum, & Harmon, 2004). The distribution of referral questions and diagnoses also was similar to other published reports, with variations representing clinics' specialties (Dunitz, Sheer, Kvas, & Macari, 1996; Emde & Wise, 2003; Frankel et al., 2004). However, the referred sample also was characterized by an unusually high level of troubled mother-child relationships, with approximately 60% of the sample meeting criteria for a tendency to or features of disordered relationship (DC 0-3 Axis II PIR-GAS range=40-60; see Wright & Northcutt, 2004), 20% scoring within the disordered range (PIR-GAS < 40), 10% scoring on the perturbed level (PIR-GAS = 70), and only 10% showing an adapted relationship (PIR-GAS = 80-90). This relatively high rate of troubled parent-child relationship (cf. Emde & Wise, 2003) represents the clinic's policy of identifying high-risk families and referring them for preventive intervention or psychotherapy. This policy was stressed throughout the nurses' training process and was reflected in the criteria for referrals. While this approach is justified clinically, it limits the generalizability of the current findings to other, less disturbed samples. Another limitation of the study is the high rate of boys compared to girls in our sample. While boys are

generally more prone to developmental and behavioral difficulties in early childhood (Shevell, Majnemer, Rosenbaum, & Abrahamowicz, 2001), research also has suggested that they differ from girls in their emotional reactions and affect-regulation modes in response to changes in maternal responsiveness (Weinberg, Tronick, Cohn, & Olson, 1999). Thus, girls may be less prone to use sustained withdrawal behavior when facing similar circumstances. Finally, the present study used the ADBB with clinic-referred, older toddlers (7–36 months) rather than a younger (2–24 months) well-baby population, for which it was designed and tested for reliability and validity. Nevertheless, the present findings support a wider use of the ADBB.

The present findings have several clinical and research implications. As noted earlier, the ADBB is a relatively simple measure that can be administered during a routine baby checkup. The present study provides evidence for the measure's validity and points to its utility as a screening tool, allowing early detection and treatment of high-risk infants. Furthermore, the findings indicate that children who develop sustained withdrawal coping style tend, as a group, to have impaired mother–infant relationships and therefore may benefit from dyadic psychotherapy, which can enhance maternal sensitivity and dyadic reciprocity and foster more adaptive socioemotional skills.

Future research should examine the developmental course of sustained withdrawal behavior over time and identify its antecedents and consequences. Furthermore, future research should focus on identifying specific risk and resiliency factors associated with withdrawal, such as gender, prematurity, social support, and the role of fathers. Finally, while it seems that early on, sustained withdrawal is a nonspecific signal of maladjustment, over time it may become more common in specific diagnostic categories. Further research and clinical data should examine its prevalence among older children, especially those diagnosed with mood and anxiety disorders.

## REFERENCES

- Ainsworth, M. S., Blehar, M. C., Waters, E., & Wall, S. (1978). *Patterns of attachment: A psychological study of the strange situation*. Hillsdale, NJ: Erlbaum.
- Ainsworth, M. S., & Bowlby, J. (1991). An ethological approach to personality development. *American Psychologist*, *46*, 333–341.
- Bandura, A. (1982). Self-efficacy in human agency. *American Psychologist*, *37*, 122–147.
- Bates, J., Freeland, C., & Lounsbury, M. (1979). Measurement of infant difficultness. *Child Development*, *50*, 794–803.
- Beck, A. T. (1978). *Beck Depression Inventory*. San Antonio, TX: Psychological Corporation.
- Beebe, B. (2000). Co-constructing mother–infant distress. *Psychoanalytic Inquiry*, *20*, 421–440.
- Beebe, B., Lachmann, F., & Jaffe, J. (1997). Mother–infant structures and pre-symbolic self and object representations. *Psychoanalytic Dialogues*, *2*, 133–182.
- Brazelton, T., & Cramer, B. (1990). *The earliest relationship*. New York: Addison-Wesley.
- Brazelton, T., Koslowski, B., & Main, M. (1974). Origins of reciprocity. In M. Lewis & L. Rosenblum (Eds.), *Mother infant interaction* (pp. 57–70). New York: Wiley.
- 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.
- Campbell, S., Breaux, A., Ewing, I., Szumowski, E., & Pierce, E. (1986). Parent-identified problem preschoolers: Mother–child interaction during play at intake and 1-year follow-up. *Journal of*

- Abnormal Child Psychology, 14, 425–440.
- Cassidy, J., & Berlin, L. (1994). The Insecure/Ambivalent pattern of attachment: Theory and research. *Child Development*, 65, 971–991.
- Crockenberg, S., & Smith, P. (1982). Antecedents of mother–infant interaction and infant irritability in the first months of life. *Infant Behavior and Development*, 5, 105–119.
- Crowell, J., Feldman, S., & Ginsberg, N. (1988). Assessment of mother–child interaction in preschoolers with behavior problems. *Journal of American Academy of Child and Adolescent Psychiatry*, 27, 303–311.
- Dunitz, M., Sheer, P., Kvas, E., & Macari, S. (1996). Psychiatric diagnoses in infancy: A comparison. *Infant Mental Health Journal*, 17, 12–23.
- Emde, R., & Wise, R. (2003). The cup is half foil: Initial clinical trials of DC: 0–3 and recommendation for revision. *Infant Mental Health Journal*, 24, 437–446.
- Engel, G., & Schmale, A. H., (1972). Conservation withdrawal: A primary regulatory process for organismic homeostasis. In CIBA Foundation Symposium: Vol. 8. Physiology, emotion and psychosomatic illness (pp. 57–85). Amsterdam: Excerpta Medica.
- Feldman, R. (1998). Coding interactive behavior manual. Unpublished manual, Bar-Ilan University, Israel.
- 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., & Rotenberg, N. (2004). Parenting stress, infant emotion regulation, maternal sensitivity, and the cognitive development of triplets: A model for parent and child influences in a unique ecology. *Child Development*, 75, 599–607.
- Feldman, R., Eidelman, A. I., Sirota, L., & Weller, A. (2002). Comparison of skin-to-skin (Kangaroo) and traditional care: Parenting outcomes and preterm infant development. *Pediatrics*, 110, 16–26.
- Feldman, R., Greenbaum, C., Mayes, L., & Erlich, S. (1997). Change in mother–infant interactive behavior: Relations to change in mother, the infant, and the social context. *Infant Behavior and Development*, 20, 151–163.
- Feldman, R., & Keren, M. (2004). Expanding the scope of infant mental health assessment: A community-based approach. In R. Del-Carmen-Wiggins & A. S. Carter (Eds.), *Handbook of infant mental health assessment* (pp. 443–465). Cambridge: Oxford Press.
- Feldman, R., Keren, M., Gross-Rozval, O., & Tyano, S. (2004). Mother and child's touch patterns in infant feeding disorders: Relation to maternal, child, and environmental factors. *Journal of the American Academy of Child and Adolescent Psychiatry*, 43, 1089–1097.
- Feldman, R., & Klein, P. (2003). Toddlers' self-regulated compliance with mother, caregiver, and father: Implications for theories of socialization. *Developmental Psychology*, 39, 630–692.
- 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, 492–509.
- Feldman, R., Weller, A., Sirota, L., & Eidelman, A. I. (2003). Testing a family intervention hypothesis: The contribution of mother–infant skin-to-skin contact (Kangaroo Care) to family interaction and touch. *Journal of Family Psychology*, 17, 94–107.
- Field, T. (1984). Early interactions between infants and their post-partum depressed mothers. *Infant Behavior and Development*, 7, 532–537.
- Field, T. (1995). Infants of depressed mothers. *Infant Behavior and Development*, 18, 1–13.

- Fogel, A. (1993). *Developing through relationships: Origins of communication, self, and culture*. Chicago: University of Chicago Press.
- Frankel, K., Boyum, L., & Harmon, R. (2004). Diagnoses and presenting symptoms in an infant psychiatric clinic: Comparison of two diagnostic systems. *Journal of American Academy of Child and Adolescent Psychiatry*, 45, 578–587.
- Gauvain-Piquard, A., Rodary, C., Rezvani, A., & Serbouti, S. (1999). The development of the DEGR: A scale to assess pain in young children with cancer. *European Journal of Pain*, 3, 165–176.
- Gerhold, M., Laucht, M., Texdorf, C., Schmidt, M. H., & Esser, G. (2002). Early mother–infant interaction as precursor to childhood social withdrawal. *Child Psychiatry and Human Development*, 32, 277–293.
- Guedeny, A. (1997). From early withdrawal reaction to infant depression. A baby alone does exist. *Infant Mental Health Journal*, 18, 339–349.
- Guedeny, A. (2000). Infant depression and withdrawal: Clinical assessment. In J. Osofsky & H. Fitzgerald (Eds.), *WHAIM handbook of infant mental health* (Vol. 4, pp. 455–484). New York: Wiley.
- Guedeny, 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, 559–575.
- Hammen, C., Shih, J. H., & Brennan, P. A. (2004). Intergenerational transmission of depression: Test of an interpersonal stress model in a community sample. *Journal of Consulting and Clinical Psychology*, 72, 511–522.
- Hofer, M. (1996a). Multiple regulators of ultrasonic vocalization in the infant rat. *Psychoneuroendocrinology*, 21, 203–217.
- Hofer, M. (1996b). On the nature and consequences of early loss. *Psychosomatic Medicine*, 58, 570–581.
- Hofer, M., Brunelli, S., Masmela, J., & Shair, H. (1996). Maternal interactions prior to separation potentiate isolation-induced calling in rats. *Behavioral Neuroscience*, 110, 1158–1167.
- Johnston, C., & Mash, E. J. (1989). A measure of parenting satisfaction and efficacy. *Journal of Clinical Child Psychology*, 18, 167–175.
- Keren, M., Feldman, R., & Tyano, S. (2001). Diagnoses and interactive patterns of infants referred to a community-based infant mental health clinic. *Journal of American Academy of Child and Adolescent Psychiatry*, 40, 1–9.
- Lee, C., & Bates, J. (1985). Mother–child interaction at age two years and perceived difficult temperament. *Child Development*, 56, 1314–1325.
- Matthey, S., Guedeny, A., Starakis, N., & Barnett, B. (2005). Assessing the social behavior of infants: Use of the ADBB scale and relationships to mother’s mood. *Infant Mental Health Journal*, 26(5), 442–459.
- Murray, L., Fiori-Cowley, A., Hooper, R., & Cooper, P. (1996). The impact of postnatal depression and associated adversity on early mother–infant interactions and later infant outcome. *Child Development*, 67, 2512–2526.
- Polan, H. J., & Hofer, M. (1999). Psychobiological origins of infant attachment and separation responses. In J. Cassidy & P. Shavers (Eds.), *Handbook of attachment: Theory, research, and clinical implications* (pp. 162–180). New York: Guilford Press.
- Robertson, J., & Bowlby, J. (1952). Responses of young children to separation from their mothers. *Courrier du Centre International de L’Enfance*, 2, 131–140.

- Rutter, M., & Quinton, D. (1984). Parental psychiatric disorder: Effects on children. *Psychological Medicine*, 14, 853–880.
- Salomon, J., & George, C. (1999). The measurement of security in infancy and childhood. In J. Cassidy & P. Shavers (Eds.), *Handbook of attachment: Theory, research, and clinical implications* (pp. 287–316). New York: Guilford Press.
- Sameroff, A., & Fiese, B. (1990). Transactional regulation and early intervention. In S. Meisels & J. Shonkoff (Eds.), *Handbook of early childhood intervention: theory, practice, and analysis* (pp. 119–149). New York: Cambridge University Press.
- Seifer, R., Sameroff, A., Anagnostopolou, R., & Elias, P. (1992). Mother–infant interaction during the first year: Effects of situation, maternal mental illness, and demographic factors. *Infant Behavior and Development*, 15, 405–426.
- Shevell, M., Majnemer, A., Rosenbaum, P., & Abrahamowicz, M. (2001). Profile of referrals for early childhood developmental delay to ambulatory subspecialty clinics. *Child Neurology*, 16, 645–650.
- Stanley, C., Murray, L., & Stein, A. (2004). The effect of postnatal depression on mother–infant interaction, infant response to the still-face perturbation, and performance on an instrumental learning task. *Developmental Psychopathology*, 16, 1–18.
- Suomi, S. J. (1999). Attachment in rhesus monkeys. In J. Cassidy & P. Shavers (Eds.), *Handbook of attachment: Theory, research, and clinical implications* (pp. 181–197). New York: Guilford Press.
- Weinberg, M., & Tronick, E. (1994). Beyond the face: An empirical study of infant affective configurations of facial, vocal, gestural and regulatory behaviors. *Child Development*, 65, 1503–1515.
- Weinberg, M., Tronick, E., Cohn, J., & Olson, K. (1999). Gender differences in emotional expressivity and self-regulation during early infancy. *Developmental Psychology*, 35, 175–188.
- Wright, C., & Northcutt, C. (2004). Schematic decision trees for DC: 0–3. *Infant Mental Health Journal*, 25, 171–174.
- Zeanah, C. (1993). *Handbook of infant mental health*. New York: Guilford Press.
- Zero to Three. (1994). *Diagnostic Classification, 0–3: Diagnostic Classification of Mental Health and Developmental Disorders of Infancy and Early Childhood*. Arlington, VA: Author, National Center for Clinical Infant Programs.