



## Brief report

## Depressed mothers and infants are more relaxed during breastfeeding versus bottlefeeding interactions: Brief report

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## ABSTRACT

Depressed and non-depressed mothers and their 3-month-old infants were videotaped during breastfeeding and bottlefeeding interactions. The videotapes were subsequently coded for a number of feeding interaction behaviors as well as being rated on the Interaction Rating Scales. No differences were noted between the depressed and non-depressed mothers. Several breastfeeding versus bottlefeeding group effects were observed. The breastfeeding mothers showed less burping and less intrusive behavior during the nipple-in periods as well as during the nipple-out periods. In addition, the breastfeeding mothers and their infants received better ratings on the Interaction Rating Scales. These data suggest that the depressed mothers and their infants not unlike the non-depressed mothers and their infants were benefited by breastfeeding.

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Breastfeeding has been noted to provide several advantages over bottlefeeding for mothers and for infants. Among the benefits for the mothers are decreased stress hormone levels (most especially cortisol) and enhanced sleep (Tu, Lupien, & Walker, 2006) as well as greater cellular immunity (Groer & Davis, 2006). These benefits may derive from the massage-like stimulation the mothers receive from the infants' sucking and from the infants' manipulating the mothers' breasts with their hands. For example, in one study, periods of increased massage-like hand movements or sucking on the mother's breast by their infants were followed by an increase in maternal oxytocin levels (Matthiesen, Ransjo-Arvidson, Nissen, & Uvnas-Moberg, 2001) which, in turn, would be expected to lower the mothers' stress hormone levels and enhance their immune response. In a study that provided breast massage, the quality of the mothers' milk was significantly improved by an increased number of lipids and casein concentration (Foda, Kawashima, Nakamura, Kobayashi, & Oku, 2004).

An even larger literature shows positive effects of breastfeeding for infants including superior immune function during infancy (Oddy, Scott, Graham, & Binns, 2006) and better neurodevelopment (Gerrish & Mennella, 2000; Sacker, Quigley, & Kelly, 2006), with higher IQs noted for children of breastfeeding mothers, (Hoffman et al., 2000), and even greater physical well-being as late as adolescence including a lower LDL-HDL ratio (Singhal, Cole, Fewtrell, & Lucas, 2004). Despite the documented wellness advantages of breastfeeding for infants, depressed mothers are less likely to breastfeed their infants (Dennis & McQueen, 2007), and, when they do, the duration of breastfeeding is significantly shorter (Field, Hernandez-

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Reif, & Feijo, 2002; Henderson, Evans, Straton, Priest, & Hagan, 2003). A negative correlation has also been noted between postpartum depression and breastfeeding at 6 weeks of the infants' age (Hatton et al., 2005).

Although there are many studies on the low incidence and short duration of breastfeeding in depressed mothers, there are only a few studies on the advantages that breastfeeding offers depressed mothers and their infants. One of these studies showed that the infants of depressed mothers who breastfed were less reactive temperamentally, and they had less EEG asymmetry and more positive play interactions (Jones, McFall, & Diego, 2004). In addition, there are very few feeding observation studies in which the behaviors of mothers and infants are observed and coded or rated. In a study we conducted on non-depressed mothers and infants we noted less intrusive stimulation (e.g. less excessive burping and less poking and moving the infant) during nipple-in and nipple-out periods (Field, 1977).

The purpose of the present study was to determine whether breastfeeding offers a similar advantage for the feeding interactions of depressed mothers and infants as it does for non-depressed mothers and infants. To address that question, we videotaped depressed mothers and their 3-month-old infants during either breastfeeding or bottlefeeding interactions and compared those to the breast and bottlefeeding interactions of non-depressed mothers and their infants. We expected that the depressed mothers would show less optimal feeding behavior (i.e. more intrusive stimulation) during feedings, especially bottlefeedings.

## 1. Method

### 1.1. Participants

The mothers were recruited for this study from the newborn nursery. Following informed consent, the mothers were administered the Structured Clinical Inventory for DSM-IV Diagnoses and the CES-D. The first 28 non-depressed mothers (14 breastfeeding and 14 bottlefeeding mothers) and the first 28 depressed mothers (14 breastfeeding and 14 bottlefeeding mothers) were recruited for this study.

The mothers averaged 26.6 years, their parity averaged 1.1, they were low-to-middle socioeconomic status ( $M = 3.6$  on the Hollingshead Index), they were distributed 62% Hispanic, 32% Black and 6% Caucasian, and 68% of the women lived with a partner. Their infants (60% male) averaged 38.9 weeks gestation and 3324 g birthweight. The groups did not differ on any of these background variables.

## 2. Procedure

### 2.1. Measures

Structured Clinical Inventory for DSM-IV Diagnoses (SCID). This face-to-face interview was used to determine whether the mothers met diagnostic criteria for major DSM-IV Axis I disorders. For the current study, the Affective Disorder Module was used to assess major depression disorder and dysthymia (Segal, Kabacoff, Hersen, Van-Hasselt, & Ryan, 1995).

Center for Epidemiological Studies-Depression Scale (CES-D; Radloff, 1991). This 20-item scale was included to assess symptoms of maternal depression at the neonatal and 3-month period. The women were asked to report their feelings during the preceding week. The scale has adequate test/retest reliability (.60 over several weeks), internal consistency (.80–.90) and concurrent validity (Wells, Klerman, & Deykin, 1987). A score of 16 on the CES-D is considered the cutpoint for depression (Radloff, 1991).

Mother–infant feeding interactions. For the feeding interactions, the infant was placed on the mother's lap. One camera was focused on the face and torso of the infant, and the other camera on the torso and face of the mother. A split/screen generator then combined those images to appear on the screen for coding. The following behaviors of the mothers were coded from the videotapes by observers trained to .90 reliability: (1) looking at the infant; (2) talking/vocalizing; (3) burping the infant; (4) nipple-in-stimulation (poking, moving and other intrusive stimulation when the nipple is in the infant's mouth); (5) nipple-out intrusive stimulation; and (6) rhythmic stroking the infant. Interobserver reliability averaged .83 based on the coding of one-third of the tapes and calculated by Cohen's Kappa. The videotaped behaviors of the mothers and infants were also rated on the feeding interaction component of the Interaction Rating Scales (Field, 1980). These scales have been effectively used in other studies on mother–infant interactions and are easily and reliably administered (see Field, 2010 for a review). The feeding interaction scale includes 3-point ratings of the infant's state, physical activity, head orientation, gaze behavior, and persistence in feeding. The scale has similar 3-point ratings of the mother's behavior including contingent vocalizations, timing of bottle removal, burping, and persistence of feeding by mother. The ratings are averaged for summary ratings for the mother and the infant. The interobserver reliability averaged .81 for these ratings based on Cohen's Kappa.

## 3. Results

As can be seen in Table 1, ANOVAs revealed main effects for the breastfeeding/bottlefeeding group, suggesting that the breastfeeding versus the bottlefeeding group showed: (1) less burping; (2) less intrusive stimulation during the nipple-in

**Table 1**  
Breastfeeding/bottlefeeding behaviors and ratings on Interaction Rating Scale (S.D. in parentheses).

Variables	Group				F	p
	Breastfeeding		Bottlefeeding			
	Depressed	Non-depressed	Depressed	Non-depressed		
Looking at infant	.48a (.20)	.49a (.08)	.49a (.13)	.38a (.17)	14.5	.24
Talking/vocalizing	.06a (.09)	.06a (.07)	.13a (.16)	.05a (.09)	1.47	.24
Burping infant	.02a (.04)	.30a 10a	.07b (.08)	.09b (.11)	3.59	.05
Nipple-in-stimulation	.06a (.11)	.06a (.21)	.21b (.19)	.23b (.21)	4.36	.008
Nipple-out-stimulation	.01a (.02)	.06a (.10)	.13b (.12)	.13b (.16)	3.43	.02
Rhythmic stroking	.08a (.10)	.13a (.14)	.00b (.01)	.03b (.08)	4.28	.009
Mother rating	2.58a (.19)	2.75a (3.10)	2.34b (.47)	2.28b (.43)	6.30	.02
Infant rating	2.43a (.40)	2.55a (.38)	2.14b (.55)	2.19b (.42)	4.38	.04

Significant differences between groups are indicated by different subscripts a and b.

periods; (3) less stimulation during the nipple-out periods; and (4) more stroking. Further, the breastfeeding groups had better Interaction Rating Scale Scores for both the mothers and the infants.

#### 4. Discussion

These data suggest that both depressed and non-depressed mother–infant dyads benefit from breastfeeding. Breastfeeding mothers spent more time stroking their infants, which would be considered positive because stroking appears to help infants grow and develop (Field, Diego, & Hernandez-Reif, 2010). In addition, mothers' stroking enhances mother's sensitivity to their infants' cues for the optimal level of stimulation. In turn, greater sensitivity to the infants' behavior cues might explain the lower levels of negative stimulation by the mothers (i.e. less excessive burping and less intrusive behavior during the nipple-in and nipple-out periods). The lower levels of intrusive behaviors by the breastfeeding mothers also suggest that they were more relaxed, and their infants had more opportunity to focus on feeding without distraction. Consequently, it was not surprising that their interaction ratings were superior.

Thus, these data are consistent with other reports in the literature on breastfeeding in non-depressed mothers (Field, 1977) and in depressed mothers (Jones et al., 2004). They highlight the need to promote breastfeeding or at least to provide coaching for optimal feeding interaction behaviors, which may in turn impact on later physical (Singhal et al., 2004) and cognitive (Hoffman et al., 2000) development.

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