

## Infants of Depressed Mothers Show Less "Depressed" Behavior with Their Nursery Teachers

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**ABSTRACT:** This study investigated whether infants' "depressed" behavior (i.e., less positive affect and lower activity levels) noted during their interactions with their depressed mothers generalized to their interactions with their nondepressed nursery teachers. Field et al. (1988) reported that infants of depressed mothers also show "depressed behavior" when interacting with nondepressed female adults, suggesting that the infants develop a generalized "depressed mood style" of interaction. However, in that study the adults were also strangers to the infants, confounding the results. In the present study, eighteen 3-month-old infants interacted with their depressed mothers and also with their nondepressed familiar teachers in 3-minute episodes. The infants' behavior ratings improved when they interacted with their familiar teachers compared to their interactions with their mothers. The infants' low activity levels and negative affect were specific to their interactions with their depressed mothers. Thus, the data suggest that the infants respond differentially to depressed and nondepressed adults who are familiar.

**RÉSUMÉ:** Cette étude a examiné si le comportement "déprimé" des nourrissons (c'est-à-dire défini par un affect moins positif et des niveaux d'activité plus bas) noté durant les interactions avec leurs mères déprimées se généralisaient à leurs interactions avec leurs puéricultrices non déprimées. Field et al. (1988) ont établi que les nourrissons de mères déprimées font aussi preuve d'un "comportement déprimé" durant l'interaction avec des femmes adultes non déprimées, suggérant ainsi que les nourrissons développent un "style déprimé" d'interaction généralisé. Cependant, dans cette étude les adultes étaient aussi des étrangers aux enfants, ce qui a pu introduire quelque confusion dans les résultats. Dans l'étude que nous présentons 18 nourrissons de trois mois ont eu une interaction d'épisodes de 3 minutes avec leur mère déprimée et leur puéricultrice non déprimée. Quand on les compare aux interactions avec leurs mères, les scores de comportement des nourrissons se sont améliorés durant l'interaction des nourrissons avec leur puéricultrice habituelle. Les niveaux d'activité bas et l'affect négatif étaient spécifiques à leurs interactions avec leurs mères déprimées. Les données suggèrent donc que les nourrissons répondent différemment aux adultes déprimés et non déprimés s'ils leur sont familiers.

**RESUMEN:** Este estudio investigó si la conducta depresiva de los infantes (i.e., afectos menos positivos y niveles de actividad más bajos) observado durante su interacción con sus madres depresivas, se generalizaba en cuanto a la interacción de los infantes con sus no maestras depresivas de guardería. Field et al. (1988)

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reportaron que los infantes de madres depresivas también muestran conductas depresivas cuando están con otras mujeres adultas no depresivas, sugiriendo de esa manera, que los infantes desarrollan un estado generalizado anímico de interacción depresiva. Sin embargo, en aquel estudio, las mujeres adultas eran también extrañas para los infantes, lo cual potencialmente pudiera haber confundido los resultados. En el presente estudio, 18 infantes de 3 meses interactuaron con sus madres depresivas y con sus maestras conocidas no depresivas en episodios de 3 minutos. Las evaluaciones de la conducta infantil mejoraron cuando ellos interactuaron con sus maestras, cuando la comparamos con la interacción de los infantes con sus madres. Los niveles bajos de actividad y afectos negativos resultaron específicos con respecto a las interacciones con sus madres depresivas. Por lo tanto, la información sugiere que los infantes responden diferencialmente a adultos depresivos y no depresivos si éstos son conocidos.

抄録：この研究は、うつ気分の母親との相互交流中に見られる、乳児の“うつ気分”行動（陽性の情動の減少と活動レベルの減少）が、うつ気分ではない保育園の先生との交流にまで一般化されるかどうかを検討する。Field et al (1988)の報告によれば、うつ気分の母親を持つ乳児は、うつ気分ではない大人の女性との交流においても“うつ気分”行動を示した。これは乳幼児が、一般化された“うつ気分スタイル”を発達させることを示唆している。しかし、その研究に使われた大人は、見知らぬ女性だったので、それがデータに影響した可能性がある。この研究は、18名の3ヶ月児を対象に、うつ気分の母親との交流と、馴染みのある先生との交流をそれぞれ3分間づつ観察した。母親との交流に比べ、馴染みのある先生との交流では、乳児の行動評価が改善した。乳児の活動レベルの低下と陰性の情動は、うつ気分の母親との交流に特異的であった。したがって、このデータは、うつ気分の大人とそうでない大人に対する乳児の反応が、両者とも馴染みがある場合、違うことを示唆する

Postnatal maternal depression has been shown to affect mother-infant interactions adversely as early as 2 months after birth. Studies have confirmed that depressed mothers and their infants exhibit less positive and more negative interaction behavior than do nondepressed mothers and their infants (e.g., Cohn, Campbell, Matias, & Hopkins, 1990; Field et al., 1985). Unlike nondepressed mothers, who are typically responsive to their infants' signals and show more positive affective expressions, the depressed mothers are often withdrawn and show flat affect, low levels of contingent stimulation, and unresponsiveness. Moreover, some depressed mothers have been noted to interact in an aggressive and intrusive way, suggesting different "styles" of interaction, including withdrawal and intrusive behavior (Cohn, Matias, Tronick, Lyons-Ruth, & Connell, 1986).

The infants of depressed mothers typically exhibit less attentiveness, fewer smiles, more fussiness, and lower activity levels (e.g., Cohn et al., 1990). Although such residual effects of postpartum maternal depression appear short-lived, chronic maternal depression can result in long-term adverse effects in the infants' socioemotional development (Zahn-Waxler, Cummings, McKnew, & Radke-Yarrow, 1984). Some infants of depressed mothers turn to self-regulatory behavior like gaze aversion in order to reduce the negative affect engendered by unresponsive and withdrawn maternal behavior (Tronick & Gianino, 1986). Also, infants of depressed mothers generalize or extend their "depression style" to other female adults (Field et al., 1988). Despite these suggestive data, other existing literature on mothers' simulated depression (Cohn & Tronick, 1983) and still-face behavior (Tronick, Als, Adamson, Wise, & Brazelton, 1977) has indicated that infants readily can change their behavior when the caregivers' behavior is modified to be depressed (unresponsive and withdrawn), perhaps because the infant's behavior is affected by the contingencies and type of responses displayed by the adult during the face-to-face interaction. For example, infants of depressed mothers have been shown to match their mother's level of affective expression (Beebe,

Jaffe, Feldstein, May, & Alson, 1985; Tronick & Cohn, 1989), which appears to be achieved through a process of bidirectional influence (Cohn & Tronick, 1988; Symons & Moran, 1987). In general, infants are more likely to behave positively with a familiar adult (e.g., a mother) who behaves contingently than with a familiar adult who behaves noncontingently (Gewirtz & Pelaez-Nogueras, 1992).

Field et al. (1988) investigated whether the depressed behavior of infants is specific to interactions with their depressed mothers or whether the infants' depressed style generalizes to their interactions with other nondepressed female adults. In their study, infants showed depressed interaction patterns even when interacting with nondepressed female adults. They suggested that infants' "depressed mood" is not specific to their interactions with their depressed mothers, but that it can generalize to other female nondepressed adults.

One limitation in the Field et al. (1988) study, however, was that the nondepressed females were also strangers to the infants. It is possible that the presence of a stranger could have influenced the negative activity ("depressed mood") exhibited by those infants. Moreover, from that study we cannot determine whether the observed low activity and responsivity of the infants during the interactions with the strange adults was a generalized "depressed style" of interaction, or if the presence of the strangers elicited the negative interactions. Our assumption in the present study is that for infants of depressed mothers to show less negative behaviors they may require interactions with *familiar* adults, such as fathers, grandmothers, and teachers, who are nondepressed. Conceivably, these familiar nondepressed adults may elicit/evoke more positive and less depressed behavior from these infants than their depressed mothers.

The main purpose of this study was to investigate whether 3-month-old infants of depressed mothers would behave more positively when interacting with their *familiar*, nondepressed nursery teachers. Because the infants in this study were familiar with their nursery teachers since 1 month after birth, and the nursery teachers with them, infants' interaction behaviors were expected to be less negative than their interaction behaviors with their depressed mothers. The nursery teachers were expected to show more positive and less negative interaction behaviors than the depressed mothers. In turn, the infants of depressed mothers were expected to show more positive and less negative behaviors with their nondepressed teachers than with their depressed mothers.

In this study, only depressed mother-infant pairs and familiar nursery teachers participated. Nonfamiliar adults (strangers) and nondepressed mothers were not used in this study as controls because previous research by Field et al. (1988) had already documented that depressed mothers obtain lower interaction behavior ratings compared to nondepressed adult strangers. Several other studies in the literature have documented more optimal interaction behavior for nondepressed versus depressed mothers (e.g., Cohn et al., 1986; Field, 1984).

## METHOD

### Subjects

The sample consisted of 18 depressed mothers (mean age = 17.8 yrs.,  $SD = 2.4$ ) and their infants (mean age = 3.9 mos.,  $SD = 1.3$ ), 9 females and 9 males. The

mothers were from two ethnic groups ( $N = 12$  Afro-American,  $N = 6$  Hispanic) and were of low socioeconomic status ( $M = 4.72$  on the Hollingshead two-factor index).

Mother-infant pairs were recruited from a delivery unit. At the time of testing, all infants were attending a day care center for 8 hours per day while their adolescent mothers attended a high school. Two female nursery teachers who were the infants' caregivers participated in the study. These teachers had experience with neonates and infants and were familiar with the infants who participated in this study from the time the infants were 1 month old.

### *Procedure*

When the infants were approximately 3 months old, their mothers and two teachers were given three mood-state inventories, including the Beck Depression Inventory (BDI) (Beck, Ward, Mendelson, Mach, & Erbaugh, 1961), the Center for Epidemiological Studies Depression scale (CES-D) (Radloff, 1977), and the Profile of Mood States (POMS) (MacNair, Lorr, & Dropplemen, 1971). The mean BDI score for depressed mothers at intake was 17.94 ( $SD = 8.57$ ) and  $M = 15.94$  ( $SD = 12.17$ ) at 3 months after delivery. The mean CES-D score at 3 months was 21.47 ( $SD = 12.87$ ). The mothers who participated in this study received BDI scores of at least 12 and CES-D scores greater than 16 (cutoff point of depression in most research protocols).

The BDI is a 21-item questionnaire with each item scored on a 4-point scale indicating absence/presence and range of severity of depressed feelings, behaviors, and symptoms. The scale is among those commonly employed instruments in research on nonclinically depressed samples and has reasonable psychometric properties. The CES-D correlates highly with the BDI (Radloff, 1991). The CES-D is a 20-item, 60-point questionnaire administered verbally, asking about descriptive symptoms during the past week (Radloff, 1977). It has been well validated in large-scale epidemiologic studies, with 99% of patients with known depression scoring above 16 (Husaini, Neff, Harrington, Hughes, & Stone, 1980; Weissman, Sholomskas, Pottenger, Prusoff, & Locke, 1977).

For the teachers at the time of the interaction, the mean BDI was 1 and the mean CES-D was 4. The POMS scale was administered to the mothers at testing only to determine their current depressed mood state. The scale includes 15 negative mood items, each of these being scored on a 5-point scale.

*Apparatus and setting.* Infants were seated in an infant seat directly facing their mothers/teachers at a distance of approximately 38 cm. In two separate interactions, mothers and teachers were seated directly facing the infants at eye level. All interactions were video and audio recorded. Two cameras, located on either side of the dyad, were connected to a video recorder and a special effects generator for split-screen images located in the corner of the room to enable simultaneous monitoring of the adults' and infants' behaviors. One camera recorded the frontal view of the infant, and the second camera recorded the adult (either mother's or teacher's face). A time-date generator connected to the monitor was used for timing the duration of the interaction and for subsequent behavior coding.

*Face-to-face interactions.* All infants participated in two 3-minute interaction sessions, one session with the mother and the other with the teacher. The order of these

interaction sessions was randomized. Prior to the interaction sessions, mothers were instructed to pretend they were playing with their infant at home. The two teachers were simply instructed to interact with the infant as they did at the nursery.

*Behavior ratings.* The interactions were rated by two research assistants who were naive to the hypothesis and purpose of the study. To provide data comparable to previous studies, the interactions on videotapes in the present study were scored using the Interaction Rating Scale (Field, 1980). The IRS has been used in many studies on mother-infant interactions, and interrater reliabilities have ranged from  $k = .81$  to  $.96$  ( $M = .88$ ) (Field, 1980). The IRS generates a 3-point Likert-type score (from less optimal to more optimal) for each participant in the interaction. Each infant was given two IRS ratings, one for the infant's interaction with the mother and the other for the infant's interaction with the teacher. The mother and teacher were also given a rating on each item. The entire 3-minute episode of the interaction was the unit rated, yielding one rating on each item in the scale.

The Interaction Rating Scale (IRS) measures 17 interaction behaviors including the *infant's state* (ranging from drowsy most of the time to awake), physical activity (squirring to relaxed), head orientation (toward or away from mother/teacher), gaze behavior (toward or away from mother/teacher), facial expressions (from pouting to frequent smiling), fussiness (from frequent fussing to no fussing), and vocalizations (from no vocalizations to frequent vocalizations). In addition, the scale rates the *adult's interaction state* (from anxious to attentive), physical activity (from minimal to moderate and some), head orientation and gaze behavior (away from infant or toward), facial expressions (from flat to smiling), vocalizations (paced and contingent or not on infant cues), silence during infant gaze aversion (rarely quiet to usually quiet), frequency of infantized behavior (from never imitative to frequent imitative), degree of contingent responsivity to infant cues, and game playing (from no play to frequent play of appropriate games). The internal consistency for the entire scale was satisfactory ( $\alpha = .76$ ). These interaction behavior ratings are averaged for a summary score. The summary score is listed in Table 1.

*Reliability.* Between-rater reliabilities were assessed on each measure of 40% of the total number of interactions randomly selected. Videotapes were rated independently by blind observers. Agreement was defined as the comparison rater giving the same rating to the behavioral item. The reliability was computed by Kappa coefficients (Bakeman & Gottman, 1986; Bartko & Carpenter, 1976) across all 17 adults' and infants' ratings. Coefficients ranged from  $k = .76$  to  $1.0$  ( $M = .91$ ) for the infant ratings and from  $k = .81$  to  $1.0$  ( $M = .89$ ) for the mother/teacher's ratings. (Kappas for each rating are reported on parentheses in Table 1.)

## RESULTS

First, the data were analyzed by conducting two multivariate analyses of variance (MANOVA); one MANOVA was conducted for the adult behavior ratings (grouping mothers vs. teachers), and a repeated measures MANOVA (within subject) was conducted for the infant behavior ratings (with the mothers and with the teachers). The results of the first multivariate test yielded a main effect for adult interactor,  $F(1,10) = 9.11, p < .001$ . The results of the second multivariate test yielded a significant

main effect of the infant's ratings for their interactions with their depressed mothers versus their teachers,  $F(1,7) = 6.18, p < .001$ .

### Adult Ratings

Univariate ANOVAs on each of the 17 measures (7 infant items and 10 adult items) on the Interaction Rating Scale were conducted. Results showed that the teachers received significantly higher interaction ratings on each of the 10 items. (See Table 1.)

Table 1  
Mean Interaction Ratings (IRS) of Infants with Depressed Mothers and Teachers

	Situation				Effect <i>p</i>
	Mother		Teacher		
Infant interaction behaviors:	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
State	2.72	(.57)	2.72	(.75)	n.s.
Physical activity	2.50	(.71)	2.83	(.51)	n.s.
Head orientation	2.33	(.59)	2.89	(.47)	***
Gaze behavior	2.06	(.54)	2.77	(.42)	****
Facial expressions	2.39	(.85)	2.94	(.24)	*
Fussiness	2.06	(.80)	2.72	(.46)	***
Vocalizations	2.11	(.83)	2.11	(.83)	n.s.
Summary rating	2.31	(.31)	2.72	(.23)	****
Mother/Teacher interaction behaviors:					
State	2.28	(.57)	2.94	(.24)	****
Physical activity	2.06	(.73)	2.89	(.32)	****
Head orientation	2.61	(.70)	3.00	(.00)	*
Gaze behavior	2.78	(.43)	3.00	(.00)	*
Silence during I gaze aversion	2.00	(.00)	2.39	(.61)	*
Facial expressions	2.17	(.50)	3.00	(.00)	****
Vocalizations	1.89	(.47)	2.78	(.42)	****
Infantized behaviors	1.72	(.67)	2.89	(.32)	****
Contingent responsivity	2.22	(.55)	3.00	(.00)	****
Game playing	1.50	(.62)	2.83	(.51)	****
Summary rating	2.12	(.31)	2.88	(.12)	****

Note. Higher scores are optimal for all ratings.

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .005$ ; \*\*\*\* $p < .001$ .

Compared to the depressed mothers, the teachers obtained significantly better (higher) ratings on state,  $F(1,34) = 20.74, p < .001$ ; physical activity,  $F(1,34) = 19.81, p < .001$ ; head orientation toward the infant,  $F(1,34) = 5.59, p < .05$ ; gazing at the infant,  $F(1,34) = 4.85, p < .05$ ; silence during infant gaze aversion,  $F(1,34) = 7.37, p < .01$ ; facial expressions,  $F(1,34) = 47.22, p < .001$ ; vocalizations,  $F(1,34) = 35.09, p < .001$ ; infantized (imitative) behaviors,  $F(1,34) = 44.36, p < .001$ ; contingent responsivity,  $F(1,34) = 36.21, p < .001$ ; and game playing,  $F(1,34) = 49.45, p < .001$ . In the summary rating, the teachers were rated higher than mothers on 15 of the 18 cases, and for three cases there was no difference ( $\chi^2 = 16, p < .01$ ). (Means and standard deviations are given on Table 1.)

### *Infant Ratings*

ANOVAs were also conducted on each of the 7 infant interaction behavior ratings. Infants' ratings were significantly better in 4 of the 7 items when they interacted with their teachers compared to their ratings with their depressed mothers. Infants scored significantly better with the teacher on head orientation,  $F(1,34) = 9.65, p < .005$ ; gaze behavior,  $F(1,34) = 24.86, p < .001$ ; facial expressions,  $F(1,34) = 7.14, p < .01$ ; and fussiness,  $F(1,34) = 9.34, p < .005$ . Only a marginal difference occurred on infant physical activity,  $F(1,34) = 2.62, p < .10$ , and no significant differences were noted on state ratings (alertness) and frequency of vocalizations. Fifteen out of the 18 infants received higher summary ratings during their interactions with their teachers compared to their interactions with their mothers, two infants received the same scores, and one infant rated higher with the mother ( $\chi^2 = 16, p < .01$ ). (Means and standard deviations are given on Table 1.)

### *DISCUSSION*

Field et al. (1988) concluded that infants' "depressed style" of interaction is not specific to interactions with depressed mothers, but that infants generalize their "depressed" interactions to other adults. By 3 months of age, they say, the infants of depressed mothers had already developed a "depressed mood style" of interaction. Based on their findings that the behavior of infants of depressed mothers did not differ as a function of interacting with their mothers or with the strangers, the authors concluded that the infants' "depressed mood style" generalized from interactions with their mothers to those of nondepressed adults.

In the Field et al. (1988) study, however, the nondepressed adults were also strangers to the infants. This uncontrolled factor was a confound for the observed negative affectivity of the infants during the interactions. Moreover, in that study, the strangers' interactions were less positive with infants of depressed mothers versus infants of nondepressed mothers. This result suggests that the infants' negative behaviors may have affected the strangers' responses during the interaction. That is, by providing negative feedback the infants of depressed mothers might have further contributed to the negative interaction. It is also possible that order effects contributed to the results obtained by Field et al. (1988) because all infants participated in a face-to-face interaction with their depressed mothers prior to interacting with the nondepressed adult stranger. In the present study the order of infant-mother and infant-familiar adult interactions was counterbalanced to control for possible order effects.

Thus, in the present study, the nondepressed adults were familiar to the infants and the order of interactions was counterbalanced. Higher interaction ratings were obtained for these infants when they interacted with their nursery teachers compared to their interactions with their depressed mothers. That the depressed mothers and their infants showed less positive interaction behaviors than the nondepressed teachers and the infants was not surprising given that previous literature has consistently reported less optimal interaction behavior for depressed mother-infant dyads (Cohn et al., 1990; Cohn et al., 1986; Field, 1984; Field et al., 1988).

As indicated by the interaction ratings, the nursery teachers in the present study exhibited a more positive style of interaction with the infants than did the depressed mothers. Overall, teachers showed more activity, head orientation toward the infant, gazing at the infant, silence during the infants' silence, facial expressions, vocalizations, infantized behaviors, contingent responsiveness, and game playing. In turn, the infants showed more head orientation, frequent looks (gaze behavior) and smiling, and less fussiness when interacting with their teachers than with their mothers.

There were apparently strong reciprocal influences in the dyadic interactions, a phenomenon that normally complicates any attempts to determine causality or directionality of effects. Because the Field et al. (1988) study would have led us to expect that the infants would behave similarly with the teachers and their depressed mothers (due to generalization effect), the positive influence of a *familiar nondepressed* person on the infants' behavior seems to be the most parsimonious interpretation of our results. The infants' "depressed style" of interacting did not generalize to their interactions with their teachers who were both familiar and nondepressed. Thus, familiar teachers in our study seemed to elicit or evoke positive nondepressed behavior in the infants. This interpretation is consistent with the findings of previous studies (Cohn & Tronick, 1983; Tronick et al., 1977) in which infants readily can change their behavior when the caregivers' behavior changes. This literature suggests that infant behavior is significantly affected by the contingencies and type of responses displayed by the adult during the interaction.

Elevated depressed mood scale scores were used in the present study instead of a clinically depressed population. However, our results are similar to those found with clinically depressed mothers and their infants (Kulcsar, Harbaugh, & Gelfand, 1993). Kulcsar et al. also found infant interaction differences when engaging with other adults. Together, these studies suggest that infants of depressed mothers, whether clinically depressed (Kulcsar et al., 1993) or depressed as assessed by elevated mood scale scores on the BDI and POMS, have less-effective social interactions with nondepressed adult strangers than infants of nondepressed mothers. This indicates that maternal depression need not be severe enough to warrant a clinical diagnosis in order for it to adversely affect infants' social interactions.

Unclear from the present study, however, is how the infants' positive behaviors were engendered by the familiar teachers during the interactions. One possibility is that the teachers could have exhibited a pattern of behavior that elicited and evoked a predictable set of positive responses from the infants. Also, the infants' behavior may have derived from the familiar teacher serving as a model to the infants. Thus, the infants could have imitated the teachers' behaviors, as in the social-learning process (Gewirtz & Pelaez-Nogueras, 1992).

In general, our results supported the assumption that familiar caregivers such as fathers, grandmothers, or teachers, who are nondepressed, can elicit/evoke more positive and less negative behaviors in the infants than the depressed mothers typically do. As early as 3 months, infants of depressed mothers can develop more positive interaction patterns with their nursery teachers than with their mothers.



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