

DEPRESSED MOTHERS' INTERACTIONS WITH THEIR ONE-YEAR-OLD INFANTS

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During toy-play interactions, one-year old infants of depressed mothers engaged in less object examination, daughters of depressed mothers showed less positive and more negative affect. Depressed mothers were more intrusive with sons.

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Active, focused involvement with toys has been associated with later cognitive development (Ruff & Rothbart, 1996; Yarrow, Morgan, Jennings, Harmon, & Gaiter, 1982). A deficit in active toy exploration is a sensitive indicator of risk in infants as young as 1 year (Landry & Chapieski, 1988; Ruff, McCarton, Kurtzberg, & Vaughn, 1984). One-year-olds' focused exploration is greater during interac-

tion with their mothers than during independent play, reflecting mothers' effective use of attention-directing strategies (Lawson, Parinello, & Ruff, 1992). In particular, infants' increased active exploration has been associated with their mothers' introducing objects and maintaining attention, while decreased exploration has been associated with mothers' redirecting their infants' attention and intru-

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siveness (Landry, Chapieski, & Schmidt, 1986; Lawson et al., 1992).

Children of depressed mothers demonstrate attentional deficits and impaired cognitive performance (Weissman, Leckman, Merikangas, Gammon, & Prusoff, 1984; Winters, Stone, Weintraub, & Neale, 1981). At the neonatal stage, infants of depressed mothers have shown inferior orienting, suggesting lesser sensitivity to maternal cues (Abrams, Field, Scafidi, & Prodromidis, 1995). At 3 months, less mutual attentiveness occurs in depressed dyads (Field, Healy, & Leblanc, 1989). During interactions with their toddlers, depressed mothers (versus mothers free of psychiatric diagnoses) have initiated and terminated more contacts with toys (Breznitz & Friedman, 1988). Using verbal and nonverbal tactics, they more frequently directed infants' attention toward and away from toys. Their toddlers, in turn, focused on more objects but for shorter durations, a pattern identified as more typical of younger, less cognitively mature infants. In another study, toddlers' interactions with their depressed mothers included less time in collaborative joint attention than those in dyads with nondepressed mothers (Raver & Leadbeater, 1995).

In at least one study, preschoolers' cognitive deficits were unrelated to *concurrent* levels of maternal depression, but they were associated with maternal depression during the first year postpartum (Cogill, Caplan, Alexandra, Roson, & Kumar, 1986), highlighting the importance of the first year for cognitive development. Evidence also suggests that exposure to a postpartum depressed mother may be particularly detrimental for boys. For example, comparing children of depressed and nondepressed mothers, Sharp et al. (1995) found that preschool boys' cognitive performance did not differ if their mothers had become depressed *after* the first year postpartum. However, if their mothers had been depressed during the first year postpartum, the preschool boys performed poorly compared with sons of nondepressed mothers, on cognitive tasks. Moreover, these deficits persisted

even if the mothers had recovered from depression after the first year. In contrast, cognitive performance of daughters of depressed and nondepressed mothers did not differ. One possible account for the gender differences suggested by the authors was that depressed mothers might treat their infant sons and daughters differently. Support for this comes from longitudinal research which found that sons, more than daughters, of depressed mothers were at risk for cognitive deficits (Murray, 1992). Subsequent analyses of the speech styles of postnatally depressed and nondepressed mothers of 2-month-old infants revealed that speech toward daughters was not differentiated by maternal depression status, but compared with nondepressed mothers of sons, depressed mothers of sons expressed less infant-focused speech, and this was strongly associated with poorer cognitive performance later in infancy (Murray, Kempton, Woolgar, & Hooper, 1993). Interaction studies have also shown that depressed mothers direct more anger toward sons than daughters (Weinberg, 1996), and work in the attachment literature has noted that depressed mothers are more engulfing with sons (Radke-Yarrow et al., 1995). Finally, some evidence of greater affective engagement with girls may be drawn from reports of more coinciding expressions of negative affect between depressed mothers with daughters than with sons (Radke-Yarrow, Nottelmann, Belmont, & Welsh, 1993). The present study assessed object exploration and affect of 1-year-olds and the behaviors of their depressed and nondepressed mothers in a toy play situation.

Participants were recruited in person on a maternity unit of a university hospital to participate in a longitudinal study and were paid at each assessment period (on at least one prior occasion, at delivery, 3 months, or 9 months). When the mothers, all of whom spoke English, and infants arrived at the laboratory, near the hospital, for the 12-month visit they were greeted by a white, female, English-speaking, experimenter whom they had not met previously and were given an informed consent and

the Beck Depression Inventory (BDI). The BDI consists of 22 four-point items describing depressed symptoms (Beck, Ward, Mendelson, Mach, & Erlbaugh, 1961). Participants with scores in the low (0 - 2) and undefined (9 - 12) ranges were excluded from the study in accord with other investigators' use of the BDI (Field et al., 1991; O'Hara, Rehm, & Campbell, 1983).

The sample comprised 64 dyads, including mothers who were classified as depressed (BDI > 12; $N = 25$) and nondepressed (score 3-9; $N = 39$). Of the 25 depressed participants, data available for 18 who had been interviewed during the postpartum period revealed that 16 of the 18 had scored in the depressed range, suggesting that the depressed sample may have been chronically symptomatic. The mothers were English-speaking, low SES (4.5 on the Hollingshead Index), Hispanic (35%), African-American (60%) and white (5%) primiparas (73%) ranging in age from 15 to 22 years

($M = 19.0$). The infants were full-term ($N = 30$ males) ranging in age from 11 to 14 months ($M = 12.1$). The depressed and nondepressed groups did not differ on the demographic variables.

Immediately after completing the BDI, the dyads were seated on a carpet with a basket of toys including dolls with blankets, teapot with lid, teacups, saucers and spoons, books, telephone, train with several cars, ball, nesting rings, cars with miniature passengers, puppet, sunglasses and two dozen blocks. When the dyads were quietly settled, the experimenter instructed them to "have fun together," left the area and videotaped the play interaction for 3 min. Mothers then completed questionnaires on demographic information, and infants were observed in some additional procedures.

For the videotape coding, two coders observed the entire 3 min. interaction, available for all participants, using laptop computers to record real time durations of the interaction behaviors (Guthertz & Field,

TABLE 1
Definitions of Behaviors. (Interobserver reliabilities are in parentheses.)

<i>Behaviors</i>	<i>Description</i>
<i>Infant Behaviors</i>	
Focused Play (.69)	Infant manipulates and looks at a single toy while demonstrating any facial expression.
Positive Affect (.72)	Smile or laugh in any direction, spontaneous affection.
Negative Affect (.72)	Negative facial expression in any direction, or negative vocalization, physical withdrawal from mother, aggressively rejects toy.
<i>Mother Behaviors</i>	
Introduce Toy (.66)	Presents a toy when infant is not attending to a single toy. Models a novel use by demonstrating with an identical toy. Reinforces contingently (e.g., applauds when infant puts lid on teapot).
Maintain Attention (.68)	Supports a toy for infant while infant manipulates it. Removes clutter. Watches child.
Redirect Attention (.66)	Presents toy while infant is playing with a different toy. Draws attention to more than one toy at a time. Makes toys inaccessible by scattering them or heaping them into a pile.
Physical Intrusiveness (.72)	Grabs the toy which the infant is holding. Grabs infant's face to direct his/her attention. Causes the infant to be unbalanced or to tip over by thrusting a toy aggressively toward him/her or by withdrawing a toy as the infant reaches to grasp it. Restrains infant from withdrawing from her. Draws infant toward herself through rough handling and brisk movements. Demonstrates threatening gestures (e.g., looms over infant, raises hand as if about to slap infant). Pokes infant, tickles for more than 2s.

TABLE 2
Mean Percent Time Mother and Infant Behaviors Occurred (SDs in parentheses).

	Nondepressed		Depressed		<i>p</i>
	Male (<i>n</i> = 18)	Female (<i>n</i> = 21)	Male (<i>n</i> = 12)	Female (<i>n</i> = 13)	
Infant Behaviors					
Focused Play	46.9a (19.4)	34.5a (19.1)	27.4b (17.0)	27.6b (20.6)	D**
Positive Affect	1.0a (.2)	1.9a (.3)	1.6a (1.5)	.2b (.2)	I*
Negative Affect	1.0a (.2)	.9a (.2)	.9a (.2)	3.1b (1.3)	I*
Mother Behaviors					
Introduce	12.0a (10.6)	18.4b (13.0)	20.8b (14.5)	11.3a (9.5)	I*
Maintain	47.9a (20.0)	54.9b (20.5)	42.5a (19.6)	57.5b (17.1)	S*
Redirect	35.5a (20.7)	22.8b (20.5)	33.7a (21.4)	25.5b (18.8)	S*
Physical					
Intrusiveness	2.4a (2.2)	3.2a (3.1)	4.7b (3.5)	2.7a (2.1)	I*

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

Means bearing different subscripts differ at $p < .05$ or less revealed by post hoc comparisons. D = maternal depression effect, S = infant sex effect, I = maternal depression x infant sex effect.

1989). On the first pass through the videotapes, they coded Focused Play, and on the second pass, they coded Positive and Negative Affect (see Table 1 for definitions). On a third pass, they coded four mutually exclusive behaviors of the mothers: Introduce Toy, Maintain Attention, Redirect Attention and Physical Intrusiveness (Landry et al., 1986; Lawson et al., 1992). Thirty percent of the videotapes were coded by both coders, yielding Kappa scores for agreements ranging from .69 to .72 for the infant behaviors, and .66 to .72¹ for the mother behaviors (Bartko & Carpenter, 1976). The coders were naive to the mothers' depression status and had been trained to the criterion of .68 before coding data.

Group (depressed/nondepressed) by infant sex analyses of variance were conducted on the percent of time infant and mother behaviors occurred (Table 2). Post hoc Bonferroni *t* tests were used for significant interaction effects. A group effect for Focused Play revealed that infants of depressed mothers spent less time in focused play, $F(1, 60) = 6.80$, $p < .01$. The group by infant sex interaction effects for infant Positive Affect, $F(1, 60) = 4.20$, $p < .05$, and Negative Affect, $F(1, 60) = 5.40$, $p < .05$, revealed that the least frequent positive affect and the most frequent negative affect occurred in the daugh-

ters of depressed mothers. The group by sex interaction effects for mothers' Physical Intrusiveness, $F(1, 60) = 4.30$, $p < .05$, revealed that sons of depressed mothers experienced the most physical intrusiveness. The group by sex interaction effects for mothers' Introduce Toy, $F(1, 60) = 5.80$, $p < .05$, revealed more frequent introducing toys with sons than daughters by depressed mothers, while nondepressed mothers introduced toys more with daughters than sons. A main effect of infant gender suggested that mothers showed more Maintaining Attention with daughters, $F(1, 60) = 4.40$, $p < .05$, and more Redirecting Attention with sons, $F(1, 60) = 4.50$, $p < .05$.

Mother and infant behaviors were transformed to z-scores, and correlations between maternal and infant behaviors (Table 3) revealed that in dyads with nondepressed mothers, infants demonstrated more Focused Play when their mothers demonstrated less Physical Intrusiveness, $r(39) = -.47$, $p < .01$. Infants also demonstrated more Negative Affect when their mothers demonstrated more Redirect Attention, $r(39) = .35$, $p < .05$, more Physical Intrusiveness, $r(39) = .37$, $p < .05$, and less Maintain Attention, $r(39) = -.45$, $p < .01$. In dyads with depressed mothers, all correlations were nonsignificant.

That one-year-old infants of depressed mothers spent less time in focused play is consistent with literature documenting less attending behavior in younger infants (Cohn, Campbell, Matias, & Hopkins, 1990; Field, 1984) and older toddlers (Breznitz & Friedman, 1988; Raver & Leadbeater, 1995) of depressed mothers. That depressed mothers were more intrusive with boys is consistent with reports of depressed mothers' excessive involvement and greater anger toward sons (Radke-Yarrow et al., 1995; Weinberg, 1996) and supports previous evidence of depressed mothers' differential treatment of sons and daughters, such as Murray et al.'s (1993) observation that depressed mothers directed less infant-focused speech toward sons. Maternal intrusiveness at 6 months postpartum has also been associated with academic underachievement in first-grade boys (Egeland, Pianta, & O'Brien, 1993). The maternal intrusiveness commonly seen in depressed mothers (Cohn, Matias, Tronick, Connell, & Lyons-Ruth, 1986; Field et al., 1990) highlights the need for further research on this characteristic and whether it mediates later deficits particularly noted in boys' cognitive performance (Murray, 1992; Sharp et al., 1995). Mothers in both groups redirected attention more frequently with their sons and they maintained attention more frequently with their daughters. Differential treatment of boys and girls may relate to maternal attitudes. Murray et al. (1993) suggested, for example, that mothers may tend to expect male infants to be more vulnerable, more difficult and to require greater effort on the part of parents (Malatesta & Haviland, 1982). The greater effort required could be especially burdensome for depressed mothers. The less positive and more negative affect in the female infants of depressed mothers was also consistent with the literature (Radke-Yarrow et al., 1993).

The correlation findings revealed that non-depressed mothers' greater maternal intrusiveness was associated with infants' showing more negative affect and less focused play. Also supporting previous work (Landry et al.,

1986; Lawson et al., 1992), infants' negative affect increased with mothers' redirecting attention, and decreased with mothers' maintaining attention. The absence of any associations between mother and infant behaviors in the depressed mother group is not easily interpreted. This may evidence asynchronous interactions, as shown in earlier research with younger infants (Field, Healy, & Leblanc, 1989). It might also indicate that infant characteristics are a mediating influence since, already at birth, infants of depressed mothers are less responsive (Abrams, Field, Scafidi, & Prodromidis, 1995; Murray, Stanley, Hooper, King, & Fiori-Cowley, 1996). Longitudinal studies, that take newborn characteristics into account, as well as studies on bidirectional interactive processes are needed to further understanding of these relationships.

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NOTE

1. Due to infants' mobility, coders sometimes had difficulty determining whether an infant was already preoccupied with a toy when their mothers presented a toy. This resulted in somewhat lower interobserver reliabilities for mothers' Introduce Toy and Redirect Attention.

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