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Psychopathology, mother–child interaction, and infant development: Substance-abusing mothers and their offspring

LEILA BECKWITH, JUDY HOWARD, MICHAEL ESPINOSA, AND RACHELLE TYLER
University of California at Los Angeles

Abstract
The course of severe depressive symptoms from pregnancy to 6 months postpartum, as well as the occurrence of severe paranoid symptoms prenatally, were examined by the Millon Clinical Multiaxial Inventory I and the Beck Depression Inventory, in 78 women who were heavy, chronic cocaine users and who retained custody of their children after birth. Six months postpartum, the quality of caregiving was observed and assessed in the home, and the children were assessed on the Bayley MDI Index in the laboratory. Mothers who were depressed and paranoid prenatally, regardless of whether the depression continued to 6 months postpartum, were less sensitive in caregiving than women without severe symptoms of paranoia or depression during pregnancy or those who reported only depression that lifted by 6 months postpartum. Mothers who were depressed prenatally and continued to be depressed by 6 months postpartum, regardless of the presence or absence of paranoia, had infants who earned lower Bayley MDI scores than the offspring of women without severe psychological symptoms or women whose depression had lifted. Severe depressive symptoms during pregnancy, if they did not continue to 6 months postpartum, did not appear to adversely influence either caregiving or infant functioning.

There is an identified, strong connection between substance abuse and psychopathology. Individuals with mental health problems, as compared to the general population, have a significantly increased likelihood of abusing drugs (Kessler, Nelson, McGonagle, Edlund, Frank, & Leaf, 1996; Schottenfeld, 1993). Similarly, those who abuse drugs have a markedly increased lifetime occurrence of diagnosable psychopathology (Carey, Carey, & Meisler, 1991; Ziedonis, Rayford, Bryant, & Rounsaville, 1994). Although some investigators suggest that there is a pattern of psychiatric distress specific to substance abusers, with mood disorders being a major component (Flynn, Luckey, Brown, Hoffman, Dunteman, Theisen, & Hubbard, 1995), most investigators find that substance abuse, including cocaine use, is not connected to a particular form of psychopathology but rather associated with a wide range of psychological disorders that includes affective disorders, anxiety disorders, personality disorders, and psychoses (Spotts & Shontz, 1991).

The term "dual diagnosis" refers to the coexistence of a substance use disorder and another mental health disorder, and it is widely accepted that the high likelihood of dual diagnoses among individuals who abuse drugs must be identified in treatment (Riley,1994; Schottenfeld, 1993). Less recognized, but with emerging awareness, is the assertion that maternal dual diagnoses may affect parenting and developmental processes within the child (Freier, 1994; Luthar, Cushing, Merikangas, & Rounsaville, 1998).

In non-drug-abusing populations, maternal psychopathology has been shown to adversely

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Address correspondence and reprint requests to: Leila Beckwith, 300 Medical Plaza, Department of Pediatrics, University of California, Los Angeles, CA 90095.

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affect mother–infant interaction and child development. Most studies have typically focused on schizophrenia or affective disorder, Axis I categories, as classified by the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-III, DSM-III-R, and DSM-IV; American Pschiatric Association, 1980, 1987, 1994). Axis I disorders are defined as acute clinical syndromes of moderate to marked severity that wax and wane over time, depending on the impact of stressful situations.

Caregiving by women who are diagnosed as either schizophrenic or affective disordered (unipolar depression and bipolar disorder), when compared to women with no mental illness, tends to involve more negative and less positive affect, and to be less responsive and less involved (Goodman & Brumley, 1990; Grunebaum, Cohler, Kauffman, & Gallant, 1987; Jameson, Gelfand, Kulcsar, & Teti, 1997). However, when diagnostic groups are compared to each other, the diagnosis per se accounts for less difference in quality of parenting than do nonspecific features of distress (i.e., the severity of self-reported depressive symptoms; Sameroff, Seifer, Zax, & Barocas, 1987).

Studies of depression symptoms severity, even among women who are undiagnosed, indicate that mothers with severe dysphoric symptoms tend to show flatter affect and to provide less stimulation or responsiveness to their infants (Cohn & Campbell, 1992). Their infants also show less attentiveness, and are more fussy than infants of nondysphoric mothers (Field, 1992). The adverse effects are particularly salient among lower class, single women and their infants (Campbell, Cohn, & Meyers, 1995), as multiple environmental risks accumulate (Seifer, Sameroff, Dickstein, Keitner, Miller, Rasmussen, & Hayden, 1996).

Axis II categories (e.g., dependent, narcissistic, antisocial, schizotypal, and paranoid personality among others; American Psychiatric Association, 1980, 1987, 1994) describe more enduring personality characteristics that may be of mild, moderate, or marked maladaptive severity. Systematic assessment of Axis II personality disorders in their influence on mother–child interaction is rare, but the studies that exist indicate the importance of including such psychologic impairment as risks to the parent–child relationship and to child development. Kaeller and Roe (1990), in a nonclinical group, examined the association between maternal Axis II personality variables, as assessed on the Minnesota Multiphasic Personality Inventory, and maternal interactional behavior with their 3-month-old infants. Mothers who scored high (but less than the clinical range) on Paranoia were observed to spend significantly less time holding and cuddling their infants than other mothers. The seminal study by Sameroff and his colleagues (Sameroff et al., 1987) studying women with schizophrenia, depression, personality disorders, and no mental illness found that depression in women with personality disorders was associated with the poorest development in their offspring, significantly poorer than that of children of schizophrenic mothers or personality disordered mothers without depression. A more recent study found that among women with major unipolar depression, those reporting higher rates of symptoms in the paranoid, schizoid, or schizotypal personality disorder categories were the least engaged and involved in interaction with their children (DeMulder, Tarullo, Klimes–Dougan, Free, & Radke–Yarrow, 1995). Among addicted mothers, those with higher rates of lifetime psychiatric diagnoses, including personality disorders, had more maladjusted offspring (Luther et al., 1998).

Although the research literature is limited, substance abusing women, when compared to mothers who do not use drugs, tend as a group to show deficits in the quality of their interactions with their infants (Burns, Chethik, Burns, & Clark, 1997; Mayes, Feldman, Granger, Haynes, Bornstein, & Schottenfeld, 1997; Rodning, Beckwith, & Howard, 1991). Despite the group difference, there are individual differences among substance abusing women, resulting in a range of caregiving from deficient to adequate (Rodning, Beckwith, & Howard, 1991).

Few studies have examined the association of maternal psychopathology and personality disorders to the individual differences in quality of caregiving among substance-abusing women. One exception was a study that compared methadone-maintained women to non-

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substance-using women, and found that severity of maternal psychopathology was related to mother–infant interaction and was of more import than methadone use alone (Jeremy & Bernstein, 1984). Another exception was a prior study by the current investigators that found that among cocaine-abusing women, those who were the least sensitive to their infants had showed prepartum Axis II personality symptoms within the clinical range of either histrionic, narcissistic, borderline, or paranoid disorders (Howard, Beckwith, Espinosa, & Tyler, 1995). Prepartum severe depressive symptoms did not result in decreased sensitivity. The research was limited, however, by not considering the possible interaction of Axis I, depressive symptoms, and Axis II, personality attributes, and by confining the study to only the prepartum period, without regard to the course of symptoms in the postnatal period.

This article extends the previous study by examining the influence on caregiving and infant development of both Axis II maternal symptoms during the prenatal period and Axis I symptoms, specifically, depression, during the prenatal period and at 6 months postpartum. Not all personality disorders evident among the women of this study were considered. What has not been examined by previous research is the effects, on offspring of addicted women, of specific personality disorders, particularly when combined with depression. Given that goal, and as a first step constrained by limited sample size, paranoia was chosen for analysis. Later research will need to examine whether other personality disorders act similarly or different from paranoia.

Paranoia was selected because it reflects more severe personality pathology than many other personality characteristics. Moreover, it is a disorder that is rare among nonclinical populations as well as undifferentiated psychiatric outpatients, but is more common in substance-abusing individuals (Carey, Carey, & Meisler, 1991; Denier, Thevos, Latham, & Randall, 1991; Singer, Arendt, Minnes, Farkas, Yamashita, & Kliegman, 1995). Further, paranoia is identified in the literature with less responsive caregiving (DeMulder et al., 1995; Howard et al., 1995; Kaeller & Roe, 1990).

Based on studies of non-drug-abusing women, we hypothesized that the prepartum personality disorder, paranoia, when combined with a prepartum mood disorder would adversely affect later infant development (Murray & Cooper, 1997). We further considered that chronic mood disorder beginning in pregnancy and lasting through 6 months postpartum would also adversely affect infant development (Campbell, Cohn, & Meyers, 1995; Field, 1992). We reasoned that impaired patterns of interaction occurring between mother and child in the context of paranoia and depression would mediate the associations between maternal psychopathology and adverse child development (Goodman & Brumley, 1990; Murray & Cooper, 1997).

Therefore, the following hypotheses were tested. Hypothesis 1: Among women who abused cocaine and other drugs, those who prenatally showed severe paranoid symptoms combined with severe depressive symptoms would have poorer quality interactions with their children at 6 months than would substance-abusing women without such psychological symptoms. Hypothesis 2: The chronicity of severe depressive symptoms over time, from pregnancy through 6 month postpartum, would result in poorer quality mother–infant interactions than for substance-abusing women who had not been depressed prenatally or whose prenatal depressive symptoms had diminished. Hypothesis 3: Mothers' capacities for sensitive parenting would mediate the associations between psychopathology and their infants' developmental outcomes.

Method

Subjects

Subjects were recruited on the basis of referrals from Department of Child and Family Services, Los Angeles, and local public health centers and drug treatment centers. To be eligible, subjects had to be English speaking, pregnant, heavy and chronic cocaine users, and not a teenager, homeless, or in a methadone program. Many mothers had previously given birth to a prenatally drug-exposed infant and were under court ordered supervision by the Department of Child and Family Services.

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Table 1. *Maternal and infant characteristics*

	M	*SD*
Maternal		
Age	28.9	4.8
Minority status	83.3%	
Education	11.2	1.5
Single status	84.6%	
Infant		
Gestational age (weeks)	38.5	2.4
Birth weight (g)	3018.6	533.8
Premature (i.e., <37 weeks)	17.9%	
Gender	51.3% girls	

One hundred and sixty-nine women were recruited and assessed during pregnancy. Most were polysubstance abusers using alcohol, marijuana, and nicotine, as well as cocaine. Only 9 subjects (12%) reported use of opiates. On the average the participants reported alcohol use for 4.4 years, marijuana use for 5.7 years, and cocaine use for 5.3 years. After birth, 78 retained custody of their infant and completed assessments at 6 months postpartum. Multivariate tests, Hotelling T^2, were used to compare the group for whom 6 month scores were available to those who either lost custody or did not return for testing. The groups did not differ in birth weight, gestational age, years of maternal education, or single status. The groups also did not differ as to measures administered during pregnancy.

The women were poor, many had not graduated high school, most were unemployed, and many were single. As can be seen from Table 1, most were of minority status with an ethnic distribution of 69.2% African American and 14% Latina. The children were born at somewhat decreased birth weights, and 17.9% were premature, defined by a gestational age at birth of 37 weeks or less. There were 48.7% boys and 51.3% girls.

Procedures

At the time of recruitment, on the average within the last trimester of pregnancy, the participants were interviewed individually in the laboratory as to demographic characteristics and psychological symptoms. At 6 months postpartum individual mothers and their infants came to the laboratory again, where the Bayley Scales of Infant Development were administered, and the mothers completed the Beck Depression Inventory. Within 2 weeks of that occurrence, an unstructured home observation of approximately 1-hr duration was made by a pool of four possible observers, naive to all other information.

Measures

The Millon Clinical Multiaxial Inventory I (*MCMI-I*). The MCMI-I (Craig & Weinberg, 1992) was used to identify maternal psychological symptoms during pregnancy. Because of limitations of literacy, the items were read to each subject individually, who then placed each item into either a “yes” or “no” box. The placement was not visible to the examiner due to a barrier that screened the boxes from the examiner’s gaze. The MCMI-I, widely used in diverse clinical groups, including substance abuse, was developed to correspond with the diagnostic criteria and categories of the DSM-III (American Psychiatric Association, 1980). The instrument contains 175 questions and assesses Axis I, Clinical Syndromes, and Axis II, Personality Disorders. For each of the 21 subscales, a score of 75 or greater is considered clinically significant. Items assessing paranoia reflect a vigilant alertness to ward off expected derogation and deception; a quarrelsome attitude; a skeptical mistrust of others’ motives; and a hypercriticism of undesirable personal traits in others. Items assessing depression reflect discouragement and guilt, self-deprecation, futility, and dejection, as well as excessive tearfulness, poor appetite or overeating, chronic fatigue, poor concentration, loss of interest in pleasurable activities, and a decreased effectiveness in fulfilling ordinary and routine life tasks. The MCMI-I has good reliability and validity, including high correlations with psychiatric records and diagnoses made by psychiatrists from diagnostic interviews.

The Beck Depression Inventory (*BDI*). The BDI (Beck, Ward, Mendelson, Mach, & Erbaugh, 1961) was completed by the women at

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6 months postpartum. The BDI is a 21-item inventory. Each item is scored on a 4-point scale that notes the presence and severity of depressive symptoms. It is a widely used self-report questionnaire for evaluating the number and severity of depressive symptoms. Consistent with other investigations, mothers who received a score greater than 15 were classified as dysphoric (Beck, Steer, & Garbin, 1988).

Mother–child interaction. An unstructured home observation of approximately 1 hr duration was used to measure the quality of maternal caregiving. Mothers were encouraged to care for their child, and to go about their household responsibilities as they would as if the observer were not present. The interactions were rated by 9-point rating scales with behavioral descriptors for each odd number. Seven scales, representing different dimensions of mother–child interaction, were selected from the child development literature and were used to describe maternal behavior (Ainsworth, Blehar, Waters, & Wall, 1978; Vaughn, Crichton, & Egeland, 1982). Two judged affect, Delight and Expressed Negative Regard; two judged physical contact, Facilitation and Quality of Physical Contact; one judged amount of interactive Stimulation; and two judged components of sensitive interaction, Intrusiveness and Sensitivity to Infant Cues. A composite score, Caregiving, summed the scores of the seven scales (reversing the scores for Expressed Negative Regard and Intrusiveness). A high level of internal consistency for the composite was shown by Cronbach's alpha ($\alpha = .90$). The observations were made by one of a pool of four persons, each of whom were unaware of MCMI and Beck scores. Interrater reliability was established by coding videotaped samples of 12 mother–child dyads at home. Kappa coefficients ranged between .70 and .99 for interrater reliability with agreement defined as differing by no more than 1 point on the 9-point scales.

The Mental Development Index (*MDI*). The MDI of the Bayley Scales of Infant Development (Bayley, 1969) was administered in the laboratory when the children were 6 months of age. For those who had been born preterm, testing was conducted at 6 months plus the number of weeks of prematurity as reported on their hospital record. The examiner was unaware of MCMI and Beck scores, as well as home observation ratings.

Table 2. *Means and standard deviations of measures*

	M	*SD*
Prenatal		
MCMI-I Paranoid	80.4	18.1
MCMI-I Dysthymia	73.9	22.6
Postnatal		
Beck Depressive Index	11.6	7.5
Caregiving		
Delight	5.4	2.0
Expressed Negative Regard	7.8	1.4
Facilitation	5.3	1.6
Quality of Physical Contact	5.4	1.7
Stimulation	6.0	1.5
Intrusiveness	6.6	1.8
Sensitivity to Infant Cues	4.9	1.4
Composite Sensitivity	5.8	1.3
Bayley MDI	102.7	15.7

Results

The statistical analyses that follow examined maternal psychopathology from both a continuous perspective using scale scores across all participants, and from a categorical perspective (i.e., those whose symptoms did fall within the clinical range were compared to those who did not).

Means, standard deviations, and intercorrelations of measures

Table 2 lists means and standard deviations. Scores for paranoia and dysthymia during the prenatal period were exceedingly high, with the average score for the group either within the clinical range or just approaching it. The average score for depressive symptoms at 6 months postpartum did not reach nor approach clinical cutoff. The Bayley MDI average was within the average range.

Table 3 indicates the intercorrelations of measures. There was no evidence that symp-

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Table 3. *Intercorrelations of maternal psychological symptoms, cargiving composite, and Bayley MDI*

	MCMI I Dysthymia	Beck	Sensitivity	MDI
MCMI-I Paranoia	−.18	−.05	−.33**	−.39**
MCMI-I Dysthymia		.24*	.03	.01
Beck Depression			−.16	−.27*
Composite: Sensitivity				.22*

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

toms of paranoia and dysthymia were associated. There appeared to be a modest association from the prenatal to the postpartum period in dysthymia. The caregiving composite was associated inversely with paranoia, but not with dysthymia for either of the two periods tested. Bayley MDI scores were associated modestly and inversely with both maternal symptoms of prenatal paranoia and postpartum dysthymia. Bayley MDI scores were associated modestly and directly with the composite of caregiving sensitivity.

Severe maternal psychological symptoms during pregnancy

Severe psychological symptoms within the clinical range, especially symptoms of depression and paranoia, were found to be very prevalent in this sample of pregnant women. Only 11 (14%) described themselves as not experiencing a level of depressive or paranoid symptoms within the clinical range. Thirty-one percent of the sample reported severe depressive symptoms, 29% reported severe paranoid symptoms, and 26% reported both severe paranoid and depressed symptoms. The women did not fare well on other MCMI scales as well: 33% were within the clinical range on schizoid symptoms, 53% on avoidant symptoms, 50% on dependent symptoms, 47% on histrionic symptoms, 44% on narcissistic symptoms, 30% on antisocial symptoms, 60% on passive aggressive symptoms, 30% on borderline symptoms, 54% on anxiety symptoms, 20% on psychotic thinking, and 38% on psychotic delusions.

Table 4. *Number and percent of subjects grouped as to maternal prenatal and postnatal depressive and paranoid symptoms*

Prenatal		Postnatal		
Depressed	Paranoid	Depressed	*n*	Percentage
—	—	—	9	11.5
Yes	—	—	16	20.5
—	Yes	—	20	25.6
Yes	Yes	—	10	12.8
—	—	Yes	2	2.6
Yes	—	Yes	8	10.2
—	Yes	Yes	3	3.9
Yes	Yes	Yes	10	12.8

Maternal depressive symptoms 6 months postpartum

There appeared to be a decline in incidence of severe dysthymia from pregnancy to 6 months postpartum, although the use of different measures at the two periods makes the findings equivocal. Table 4 indicates the number of subjects among the four groups identified during pregnancy (those who reported severe depressive symptoms, those who reported severe paranoid symptoms, those who reported both, and those who reported neither) who did and did not report severe depressive symptoms at 6 months postpartum, using a cutoff of 15 or greater on the BDI.

A smaller percentage of the women reported severe depressive symptoms at 6 months postpartum than had during pregnancy (29% as compared to 56%). Further, severe postpartum depressive symptoms tended not to occur in the absence of severe

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depressive symptoms during pregnancy. Of those who reported severe depression postpartum, only five individuals had not previously reported prenatal depression. Of those who had reported depressive but not paranoid symptoms during pregnancy, one-third continued depressed; and among those who reported both depressive and paranoid symptoms during pregnancy, one-half continued to be depressed. However, without knowledge of the degree to which the different measures, MCMI and BDI, yield congruent "diagnoses" of clinically significant depression, inferences based on comparisons remain tentative.

Prenatal and postpartum maternal paranoid and depressive symptoms and mother–child interaction

A hierarchical regression was conducted that entered prenatal dysthymia and paranoia scores, postnatal depressive scores, and the interactions of Prenatal Depressive × Paranoia, Prenatal Depressive × Postnatal Depression, and Prenatal Paranoia × Postnatal Depression as the independent variables with the composite score of maternal caregiving as the dependent variable. The association was statistically significant, $F(6, 71) = 2.2$, $p < .05$, with an adjusted R^2 of .08. Paranoid symptoms during pregnancy were significantly associated with later poorer caregiving; however, dysthymia during pregnancy, dysthymia postpartum, and the interactional terms did not contribute significantly to the variability in caregiving.

For further clarification, a series of one-way ANOVAs were used to identify differences in mother–child interaction scores associated with presence or absence of severe maternal psychological symptoms at the two time points. Of the eight groups defined in Table 4, two groups, those who became depressed without prior depressive symptoms during pregnancy, needed to be omitted due to small cell size of less than five subjects. The remaining six groups, identified as to presence or absence of severe depressive and paranoid symptoms during pregnancy, and presence or absence of severe depressive symptoms 6 months postpartum, did not differ significantly on the mother–child interaction scales of Stimulation, Facilitation, Quality of Physical Contact, Intrusiveness, and Delight. However, the groups were significantly different as to Negative Regard, $F(5, 67) = 3.2$, $p < .01$; Sensitivity, $F(5, 67) = 3.9$, $p < .00$; and the composite caregiving score, $F(5, 67) = 3.0$, $p < .02$. Post hoc Tukey pairwise comparisons indicated that those who had been depressed but not paranoid and were no longer depressed postpartum provided better caregiving than those who were depressed and paranoid prenatally, whether or not the depression remitted postpartum. Women who did not report symptoms within the clinical range of either the paranoid or dysthymia scale were not significantly different in caregiving from any other group (see Table 5).

Prenatal and postpartum maternal paranoid and depressive symptoms and infant Bayley MDI scores

A hierarchical regression analysis was conducted that entered prenatal dysthymia and paranoid symptoms, postnatal depressive symptoms, and the interactions of Prenatal Depressive × Paranoid symptoms, Prenatal × Postnatal Depressive symptoms, and Prenatal Paranoid × Postnatal Depressive symptoms as the independent factors with Bayley MDI scores as the dependent variable. The overall association was statistically significant, $F(6, 71) = 3.9$, $p < .002$, with an adjusted R^2 of .18. The largest contribution was made by prenatal paranoid symptoms, with an adjusted R^2 change of .16. Beck symptoms contributed more modestly with an adjusted R^2 change of .08. Neither prenatal dysthymia nor any of the interactional terms made a significant contribution to the variability in MDI scores.

For further clarification, categorical analyses were conducted by a one-way ANOVA that compared Bayley MDI scores of the offspring of women grouped as to presence or absence of severe depressive and paranoid symptoms during pregnancy and the presence or absence of severe depressive symptoms postpartum. Findings were significant, $F(5, 67) = 4.1$, $p < .00$. Tukey pairwise comparisons indicated that those who had been severely depressed during pregnancy, but were

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Table 5. *Maternal prenatal and postnatal paranoid and depressive symptoms: Caregiving and infant MDI scores*

Prenatal		Postnatal		Caregiving Composite		MDI Scores		
Depressed	Paranoid	Depressed	*n*	*M*	*SD*	*M*	*SD*	
—	—	—	9	5.4	1.7	110.9	11.2	
Yes	—	—	16	5.8[a,b]	0.9	114.4[a,b]	10.3	13.3
—	Yes	—	20	4.9	1.4	100.5	16.0	
Yes	Yes	—	10	4.0[a]	1.2	98.7	9.8	
Yes	—	Yes	8	4.9	1.5	96.0[a]	14.9	
Yes	Yes	Yes	10	4.0[b]	1.1	96.0[b]	13.2	

Note: Two groups are omitted because of a cell size of <5. Groups with the same superscripts are significantly different. $F(5, 67) = 3.9$, $p < .004$.

without paranoid symptoms, and were no longer severely depressed postpartum had children whose MDI scores were significantly higher than those who continued to be depressed postpartum, whether or not they had been only depressed or depressed and paranoid during pregnancy. Table 5 indicates the mean scores of the groups. Note that among offspring of women who were dysthymic during pregnancy, their offspring earned a mean IQ of 96 if the women stayed depressed postpartum, in contrast to the mean MDI score of 114 for offspring of women who were depressed early but were no longer depressed postpartum.

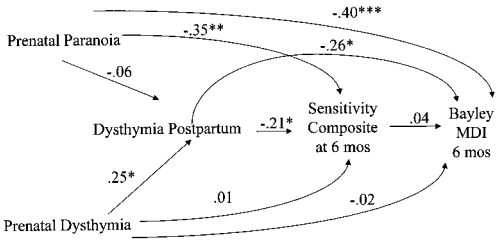


Figure 1. Path analysis from prenatal maternal psychopathology to infant Bayley MDI scores at 6 months.

Path analysis from pregnancy to 6 months postpartum

For further clarification, a path analysis was conducted that examined the contribution of maternal prenatal depressive and paranoid symptoms, maternal depressive symptoms 6 months postpartum, and quality of caregiving at 6 months to infant Bayley MDI scores at 6 months. As shown in Figure 1, prenatal paranoid symptoms were associated with later decreased quality of caregiving and decreased infant functioning. Dysthymia during pregnancy was unrelated to later caregiving and infant development, unless depressive symptoms did not lift by 6 months postpartum. Under that circumstance, both quality of caregiving and infant development suffered. Quality of caregiving did not mediate the link between maternal psychological symptoms and infant MDI scores.

Discussion

Severe paranoid symptoms, reflecting Axis II personality disorder, were notable during pregnancy for many women in our sample, all of whom were living in poverty and were heavy and chronic abusers of drugs. Whereas paranoia is reported in less than 5% of psychiatric outpatients from diverse clinical settings (Millon, 1987), the rate of severe symptoms within the clinical range among our participants was 55%. The results are consistent with previous research that has shown that individuals who use cocaine and other substances have a much higher likelihood than their non-drug-using peers to show severe personality pathology, including paranoia (Carey et al., 1991; Denier et al., 1991; Singer et al., 1995).

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Maternal personality symptoms of paranoia were deleterious to the quality of caregiving, particularly among women who also reported severe depressive symptoms during pregnancy. They were the least sensitive, the most hostile, the most intrusive, and showed less delight than their peers when interacting with their 6-month-old infants.

Severe depressive symptoms, with and without paranoid personality disorder, were also marked during pregnancy for many women in our sample. The findings were consistent with the research that shows that mothers, even if they are non-drug-using, tend to show increased depressive symptoms under conditions of poverty, unemployment, poor education, and single status (Hall, Gurley, Sachs, & Kryscio, 1991).

Of interest, however, was the finding that the incidence of severe depressive symptoms appeared to decline by 6 months postpartum, although the data derived from different measures across time must be considered to be tentative. Yet, whereas a majority of women had showed depressive symptoms within the clinical range during pregnancy, only a minority of women appeared to do so by 6 months postpartum. Moreover, severe depressive symptoms were unlikely to develop postnatally if they had not been present prenatally. The findings, although provisional, are consistent with the course of depression from the prenatal to postpartum period among non-drug-using women. Campbell, Cohn, Flanagan, Popper, and Meyers (1992) found that among women who were delivering their first child, and were recruited because of diagnosed depression, most women's depressions had lifted by the time their infants were 6 months of age, with only a quarter of the group continuing to manifest clinically significant symptoms.

Thus, while severe depressive symptoms were found to be common during pregnancy among our substance-abusing women, their depressive symptoms, when restricted to pregnancy and when not combined with paranoid symptoms, were not predictive of later poor caregiving, nor of lowered Bayley MDI scores in the offspring. Therefore, recognition of the increased likelihood of severe depressive symptoms among substance-abusing women (Luthar, Cushing, & McMahon, 1997), while important and accurate, is too general a characterization of their psychological problems. Psychopathology in these women is complex, and depression tends not to be a singular problem. Moreover, depressive symptoms, by themselves, may not explain individual differences in the quality of care given by substance-abusing women to their infants.

In fact, a most startling finding of this study was that the highest quality of caregiving occurred when women did not have paranoid symptoms but did suffer severe depressive symptoms during pregnancy, which then remitted postpartum. It is possible, but not known at this point, that those mothers' life circumstances may have improved substantially between pregnancy and 6 months postpartum, allowing their depression to lift and their quality of caregiving to be enhanced. In contrast, women who were depressed during pregnancy and remained so at 6 months postpartum provided a lower quality of caregiving, and women who were depressed and paranoid during pregnancy, whether or not the depression lifted postpartum, were the least sensitive in interacting with their infants as compared to all other mothers.

The occurrence of severe paranoid symptoms and the course of maternal depressive symptoms were important not only to the quality of parenting, but also to the development of the infant. Consistent with our data, an adverse influence of chronic, postpartum, maternal depressive symptoms on the infant has been noted. Campbell et al. (1992) found that among depressed women, those who remained depressed by 6 months postdelivery felt more overwhelmed by the care of their infant, saw their infant as more difficult, were more anxious about their competence as a parent, and were less sensitive, warm, and delighted with their infant than those whose depression had lifted. Field (1992) found that if non-drug-using mothers stayed depressed during the first 6 months of their infant's life, their baby appeared depressed as well, and did more poorly at 12 months on the Bayley Scales. However, if the mothers' depressive

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symptoms lifted by 6 months postpartum, then adverse effects did not occur.

For those women in our study whose depressive symptoms did not lift by 6 months postpartum, whether or not the mood disorder was combined with paranoia, their infants earned an average MDI Bayley score of 96, lower than all other infants. However, women with paranoia, even without postpartum depression, also had infants with decreased Bayley MDI scores, with the average score less than 100. Surprisingly, and completely counter to the notion that maternal prenatal severe depressive symptoms put infant development at risk, the most competent infants, with an average Bayley MDI index of 114, were being reared by mothers, without paranoid symptoms, who suffered severe depressive symptoms prenatally, which then lifted postpartum.

Although less sensitive caregiving was associated with chronic depressive or paranoid symptoms and with lowered developmental competence in the infants, this study did not find that the quality of caregiving mediated the association, in contrast to comparable studies with non-drug-using women (Goodman & Brumley, 1990; Murray & Cooper, 1997). Clearly more research is needed to address this issue with substance abusing women and their offspring.

Generalizations are limited by the nature of the measures as well as the sample. Since two different measures of depressive symptoms were used, any discrepancies between the two compromise the assumptions of comparability over time. Further, the measure of paranoid symptoms was not repeated, and it is not known whether the assumptions of continuity of such symptoms is warranted. Moreover, neither measure identified clinical disorders, but rather the severity of symptoms. Finally, the counterintuitive finding of the positive influence of prenatal depression when it remits postpartum has not been reported elsewhere, and points to the dynamic social context in which substance abuse exists. The sample was recruited from a disadvantaged inner city area, and research has shown differences between high- and low-risk samples in the influence of postnatal depression on mother–infant interactions (Campbell, Cohn, & Meyers, 1995). Substance abuse may moderate the meaning of prenatal and postnatal depression for parenting, a research question that requires more examination.

The findings emphasize the true complexity of psychopathology among addicted women, and underline the importance of identifying Axis II personality disorders, in combination with the course of Axis I depressive symptoms over time, when examining caregiving and children's development in this population. The complexity indicates caution in intervening only with the substance abuse, or only with the depressive symptoms, since such efforts may be insufficient to the manifold problems suffered by many addicted women. The multiple nature of their psychopathological problems and the diversity in psychopathology among addicted women suggest that intervention efforts for their offspring be guided by professionals with training in mental disorders, as well as by those trained in child development. Further, multiple interventions, dependent on the nature of their participants' psychological vulnerabilities, will need to be available.

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