
EARLY POSTPARTUM PARENTAL PREOCCUPATION AND POSITIVE PARENTING THOUGHTS: RELATIONSHIP WITH PARENT-INFANT INTERACTION

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ABSTRACT: Parenting behaviors and parent–infant emotional bonding during the early postpartum months play a critical role in infant development. However, the nature and progression of parental thoughts and their relationship with interactive behaviors have received less research. The current study investigated the trajectory of parental thoughts and behaviors among primiparous mothers ($n = 18$) and fathers ($n = 15$) and multiparous mothers ($n = 13$) and fathers ($n = 13$), which were measured at the first and third postpartum month. At the third postpartum month, the relationship between parental thoughts and parental interactive behaviors also was tested. Mothers and fathers showed high levels of preoccupations and caregiving thoughts during the first postpartum month that significantly declined by the third postpartum month. In contrast, positive thoughts about parenting and the infant increased over the same time interval. Mothers presented higher levels of preoccupations and positive thoughts than did fathers, and first-time parents reported more intense preoccupations than did experienced parents. Although maternal sensitivity was inversely related to maternal anxious thoughts, paternal sensitivity was predicted by higher levels of anxious as well as caregiving and positive thoughts.

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Infants depend on their parents for growth and survival during the first years of life (Bowlby, 1969). During this period, infants'

interactions with their parents are critical for biological, cognitive, emotional, and social development (Bornstein, 1985; Feldman, 2007; Hofer, 2006). The attachment style that infants establish through interactions with their parents also shapes their social relationship patterns later in life and can influence psychological health (Sroufe, Carlson, Levy, & Egeland, 1999; van IJzendoorn, 1995; Winnicott, 1956). While the development of infants has been well studied, the development of parenting during this early postpartum period has received less attention. Thus, the current study examines the early postpartum trajectories of parental thoughts and behaviors along multiple dimensions such as parental preoccupations, relationships, and positive thoughts about parenting. In addition, the current study addresses the links between these parental thoughts and behaviors and parent–infant interactive patterns, such as sensitivity and intrusiveness across parental gender.

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PARENTAL PREOCCUPATION

During the first months of parenthood, parents experience a dynamic change in their thoughts and behaviors that are oriented toward their new infants. Particularly, immediately after a child's birth and first few months of the infant's life, parents are highly drawn to their infants' vocalizations and physical attributes. Parents also focus their thoughts on the infant and the infant's physical and psychological needs (Bowlby, 1969; Winnicott, 1956). Such intense mental focus and behaviors were first referred to as "primary maternal preoccupation" by Donald Winnicott (1956), and may reflect an important stage for both mothers and fathers to create long-term emotional ties with their infants (Feldman, Weller, Leckman, Kuint, & Eidelman, 1999; Leckman et al., 2004; Leckman & Mayes, 1999; Leckman et al., 1999).

Leckman et al. (1999) suggested domains of parental preoccupation during the early postpartum period. The first domain considers thoughts and actions about caregiving and relationship building with infants. During early postpartum, activations of such caregiving thoughts and actions in response to infant cues (needs and appearance) drive emotional and physical proximity, with their own infants likely under the influence of parents' internal working models of childhood attachment figures (Leckman et al., 1999). The second domain involves preoccupation regarding the infant's well-being, anxious and intrusive thoughts, and harm avoidant behaviors. These preoccupation and harm avoidant behaviors are heightened consideration of potential threats coupled with behaviors that ensure infant well-being (Leckman et al., 1999).

Leckman et al. (1999) found that all domains of parental preoccupation peaked right after childbirth and then began to decrease over the course of the first 3 to 4 postpartum months. This trend has been found in both mothers and fathers (Leckman et al., 1999), albeit less intensely for fathers. Since newborns have very limited ways of communicating their needs, parents must constantly check the infants to identify and attend to those needs. The intensity of parental worries and thoughts, however, gradually decreases as parents gain more experience in parenting and infants become more responsive. However, excessively and persistently high levels of parental preoccupation, particularly anxious and intrusive thoughts and harm avoidant behaviors, can be associated with postpartum psychopathology such as postpartum obsessive compulsive disorders (OCD). In one study with mothers in Israel, levels of parental preoccupations were related to postpartum anxiety at the first month postpartum (Feldman et al., 1999). On the other hand, abnormally low levels of parental preoccupation, such as may be the case with postpartum depression, also may pose a problem and increase difficulties in developing emotional bonds with an own infant, and a risk of inadequate parenting (Feldman et al., 2009; Feldman et al., 1999).

POSITIVE PARENTING THOUGHTS

By 3 to 4 months' postpartum, infants have become more socially interactive, and parents increasingly engage in reciprocal, positive interactions. These positive interactions further help mothers to

strengthen their attachment and heightened experience of positive feelings toward their infants (Mercer, 1985). As they successfully feed, take care of, and build affectionate connections with their infants, mothers develop positive feelings and self-confidence about parenting (Benedek, 1954). Fathers also develop an attachment to their infants, although more gradually (Anderson, 1996; Pruett, 1998). Positive feelings about their infants and parenting experience have been suggested to be a critical motivating factor for parenting behaviors in both animals and humans (MacDonald, 1992; Numan & Insel, 2003), suggesting biological mechanisms. Thus, interactions with the infant may shape the motivations and rewards involved in the development and maintenance of parental behaviors. For example, as parents feel more positive about parenting their infants, they will be more attentive and sensitive caregivers. In contrast, if interactions with the infant are negative and stressful, parents may find the relationship less rewarding and be less willing to maintain it, and harbor fewer positive parental thoughts.

PARENTAL SENSITIVITY

Parental thoughts, including parental preoccupation and positive parenting thoughts, may affect the sensitivity of parent–infant behaviors. For instance, the mother's positive perception of her premature infant has been associated with greater maternal sensitivity to the infant's signals and more affectionate vocalizations and touch (Keren, Feldman, Eidelman, Sirota, & Lester, 2003). Moreover, mothers who had a positive attitude toward parenting showed greater behavioral sensitivity during interactions with their infants at 3 months' postpartum (Keller, Lohaus, Völker, Elben, & Ball, 2003). Thus, idealization of the infant and positive thoughts about parenting may enhance positive parenting behavior. On the other hand, high levels of worries about the infant, such as preoccupations with health and needs, may be associated with lower parental sensitivity and higher intrusiveness. Indeed, negative feelings with regards to parenting may be linked to the parents' difficulties in developing emotional bonding with their infants (Mercer, 1985; Nystrom & Ohrling, 2004).

Studies on parent–infant interactions have mostly targeted the mother–infant relationship. However, fathering plays a significant role for child's cognitive, emotional, and social development (Lamb, 2004; Ramchandani & Psychogiou, 2009). Literature in parental behaviors has suggested gender differences in expressed emotion during interactions with children (Volling, McElwain, Notaro, & Herrera, 2002). Maternal sensitivity is expressed by emotional warmth and support whereas paternal sensitivity is expressed by providing stimulating interactions (Grossmann, Grossmann, Kindler, & Zimmermann, 2008). This also was supported by a study of a time series analysis of 100 first-time mothers and fathers interacting with their 5-month-old firstborn child (Feldman, 2003). Mother–child play focused on face-to-face exchange and included patterns of mutual gazing, co-vocalization, and affectionate touch. In contrast, during play with fathers, the time line of arousal contained several quick peaks of high positive emotionality, including joint laughter and open exuberance.

PARENTING EXPERIENCE

In addition to assessing change in parental thoughts and perceptions and their associations with parenting behavior, the current study also examined whether parental thoughts and behaviors may be affected by previous parenting experience. Several studies have suggested that inexperienced first-time mothers tend to be more anxious than are experienced mothers during the first few postpartum months. For example, compared with experienced mothers, first-time mothers tend to be less responsive to their infants, especially to infant cries (Bernal & Richards, 1970; Fraser, Geil, & Feldman, 1974; Robson & Kumar, 1980), and more anxious while interacting with their infants (Boukydis & Burgess, 1982) and while being separated from the infants at birth (Seashore, Leifer, Barnett, & Leiderman, 1973). Although such differences in parental behaviors among first-time and experienced fathers have not been fully explored, fathers also may experience higher levels of anxiety and distress due to lack of parenting experience. The negative emotion and parenting stress may thus increase the risk for mood disorders, marital discord, and less sensitive parental behaviors among first-time mothers and fathers. Given these concerns, previous parenting experience may influence parental preoccupation and positive parental thoughts and their relationship with parental behaviors.

CURRENT STUDY

Thus, the aims of the present study are to (a) replicate earlier findings on the time course of parental preoccupation and extend them to compare the postpartum trajectory of parental preoccupation, perception of personal change, and positive experience with the birth of their infant between first-time and experienced mothers

and fathers over the first postpartum months; and (b) examine the relationship between these parental thoughts and parent-child interactive behaviors such as sensitivity and intrusiveness. We report here on a set of self-report measures and detailed, semistructured interviews regarding thoughts and behaviors of the parenting role in response to the infant at 2 to 4 weeks' and 3 to 4 months' postpartum. In addition, we also report on the results of observed parent-infant dyadic behavior collected in the home at 3 months' postpartum. Our focus is on the normative shift in parental thoughts and behaviors in the first weeks after birth that are a part of parents' emerging psychological and behavioral relationship with their new infant.

METHODS

Participants

Families whose infants were healthy and had experienced no delivery complications were recruited from the postpartum service unit of the Yale-New Haven Hospital. Both first-time and experienced parents were eligible for participation. Exclusion criteria were current or past psychiatric diagnosis and taking prescription medications within 2 weeks of the home visit. An informed consent was obtained from each participant according to procedures approved by the Yale University School of Medicine Human Investigations Committee.

Thirty-one mothers and 28 fathers were enrolled in the study. All parents were Caucasian. Most of the parents had a college and above education level, which indicates middle to high socioeconomic status (SES) (see Table 1). By 3 months, 1 first-time mother, 1 experienced mother, and 1 experienced father dropped out of the study because of relocation or career obligations. Tables 1 and 2

TABLE 1. Demographics and Mood of Mothers and Fathers

	Mothers				Fathers			
	First-Time Parent		Veteran Parent		First-Time Parent		Veteran Parent	
	Time 1	Time 2	Time 1	Time 2	Time 1	Time 2	Time 1	Time 2
<i>n</i>	18	17	13	12	15	15	13	12
Education (college degree or higher) <i>n</i> (%)	17 (94%)		13 (100%)		12 (80%)		13 (100%)	
Age (years) <i>M</i> (<i>SD</i>)	31.9 (6.4)		33.6 (4.1)		35.0 (4.9)		35.4 (4.4)	
Beck Depression Inventory ^a <i>M</i> (<i>SD</i>)	7.76 (5.90)	5.00 (4.08)	9.27 (7.09)	6.67 (5.40)	4.33 (3.22)	3.29 (2.95)	3.75 (3.84)	2.00 (1.65)
State Anxiety <i>M</i> (<i>SD</i>)	32.29 (8.16)	32.44 (9.80)	37.00 (12.76)	31.25 (11.19)	31.40 (5.88)	31.00 (5.69)	33.92 (8.82)	29.67 (7.33)
Trait Anxiety <i>M</i> (<i>SD</i>)	46.12 (2.20)	43.62 (3.84)	45.50 (2.88)	46.83 (2.55)	47.80 (3.36)	46.53 (1.96)	46.00 (2.00)	45.83 (2.98)

Note. Time 1 = 2–4 weeks' postpartum, Time 2 = 3–4 months' postpartum.

^aAt Time 1, all mothers had lower scores compared to all fathers, $F(1, 42) = 7.48, p < .01$. Scores of both all mothers and fathers reports diminished by Time 2, $F(1, 42) = 15.52, p < .001$.

TABLE 2. Parental Characteristics of Mothers and Fathers

	Mothers				Fathers	
	First-Time Parent		Veteran Parent		First-Time Parent	Veteran Parent
<i>n</i>	18		13		15	13
Older Child(ren) <i>M (SD)</i>	–		1.3 (.63)		–	1.3 (.63)
Child Sex M:F	8:10		6:7		6:9	6:7
C-section <i>n</i> (%)	10 (56%)		1 (7.7%)			
Breastfeeding ^a <i>n</i> (%)	Time 1	Time 2	Time 1	Time 2		
Exclusively	12 (67%)	4 (24%)	7 (54%)	3 (25%)		
Sometimes	5 (28%)	11 (65%)	3 (23%)	4 (33%)		
Never	1 (6%)	1 (6%)	2 (15%)	2 (17%)		

Note. Time 1 = 2–4 weeks postpartum, Time 2 = 3–4 months' postpartum.

^aMissing data: First-time parent at Time 1 (2–4 weeks' postpartum) (*n* = 1), at Time 2 (3–4 months' postpartum) (*n* = 1); Veteran parent at Time 1 (*n* = 1), at Time 2 (*n* = 1).

show the number of first-time and experienced mothers and fathers who participated at 2 weeks and at 3 months.

Procedures

Self-reports and semistructured interviews were conducted at 2 to 4 weeks' (Time 1) and at 3 to 4 months' (Time 2) postpartum in the family's home. The first interview took place, on average, 20.4 days' postpartum (*SD* = 5.9, range = 7–38); the second interview occurred, on average, 105.2 days' postpartum (*SD* = 9.5, range = 84–130). There were no significant differences in the timing of the interview between first-time and experienced parents.

Each parent was interviewed separately and then asked to complete self-report measures. At 3 months, in addition to interviews and self-reports, parents were videotaped for 5 min interacting with their infants (Feldman, 1998). Parents were instructed to interact with the infant as they usually do. No toys were offered from the experimenters; however, parents were permitted to use their own infant toys for the interactions. The interactions were videotaped individually with a mother–infant dyad and father–infant dyad in a counterbalanced order, and then in triadic interaction. The triadic data sessions are not reported in this article. Mothers agreed not to feed their infant during the videotaped interaction.

Measures

The Yale Inventory of Parental Thoughts and Actions-Revised (YIPTA-R). The YIPTA-R is a semistructured interview designed for the use of experienced clinicians at Time 1 and Time 2 after birth. The YIPTA-R was designed to elicit information concerning the specific features of new parents' thoughts and actions at each of these time points.

The fieldwork on this instrument was initiated in 1994, and the first version of the interview was reported on a study of 41 mothers and fathers (Leckman et al., 1999). Based on the experience from this earlier study, the instrument was revised to improve the wording and flow of the interview. The Hebrew translation of

the interview has been used in mothers in Israel (Feldman, Weller, Leckman, Kuint, & Eidelman, 1999). The interview also was revised to include more items regarding parents' overall positive affective response to their new child and to the experience of parenting and parents' experience of personal transformation with the birth of a child. Copies of the final interview are available upon request (J.E.S.).

In the interview, parents were asked about the occurrence of specific thoughts and actions for the previous week from the time of the interview because it covered a sufficient time period to gain an overall view of current thoughts and actions across multiple contexts and was sufficiently recent to permit reasonable recall. All interview questions were asked verbally by an interviewer, and subjects answered verbally. The verbal answers were then written down by the interviewer. Items included verbal descriptions of their experience, Likert or dichotomous style.

The specific content of the YIPTA-R covered the thoughts and actions associated with four domains (Table 3): caregiving thoughts and actions about the baby (CARE), thoughts and actions associated with relationship building (RELATIONSHIP), preoccupation regarding the infant's needs and well-being (PREOCCUPATION), and anxious intrusive thoughts and harm avoidant behaviors (AITHAB). For AITHAB, we also were interested in the range of circumstances that elicited such thoughts, the source of the threat (including the parents' own actions), and any specific measures taken to avoid harm. Cronbach's α s were 0.73 for Time 1 and 0.78 for Time 2 for CARE, 0.51 for Time 1 and 0.47 for Time 2 for RELATIONSHIP, 0.53 for Time 1 and 0.50 for Time 2 for PREOCCUPATION, and 0.68 for Time 1 and 0.68 for Time 2 for AITHAB. Discriminated validity of AITHAB suggested that AITHAB was distinguished from symptoms of depression and generalized anxiety, but resembled the symptoms of OCD (Leckman et al., 1999).

In addition, the revised version of the YIPTA-R included domains about the positive experiences of parenting (POSITIVE PARENTING) and positive thoughts about the baby (POSITIVE

TABLE 3. Items Included in the Yale Inventory of Parental Thoughts and Actions-Revised (YIPTA-R)

Domain	Items
CARE	Thoughts about the baby's well-being ^b Thoughts about baby's feeding and growth ^b Thoughts about the baby's physical comfort ^b Thoughts about baby's health ^b Thoughts about the baby's physical environment ^b Checked on the baby ^b Comforted your baby (hr per day) Fed your baby (hr per day) Cleaning your baby (hr per day) Dressing your baby (hr per day) Helped your baby get to sleep (hr per day) In direct physical contact with baby (hr per day)
RELATIONSHIP	Thoughts about baby's future development ^b Thoughts about being a parent in the future ^b Thoughts about the baby's resemblance to other family members ^c Thoughts about the "perfection and beauty" of the baby ^c Dreams about the baby ^c Talked or sung to your baby ^c Played with your baby ^c
PREOCCUPATION	Mind occupied with thoughts about the baby (hr per day in past week) Daily routine interrupted by thoughts about baby ^{b,c} Thoughts about baby interfere with concentration on other things ^c Guilt if not thinking about baby ^{b,c} Panic if not thinking about baby ^{b,c} Visually imagining baby when not in direct contact ^c Thinking about baby when at work or otherwise engaged ^c Rate level of preoccupation on scale of 1–10
AITHAB	Worries about your baby's vulnerability ^b Worries about being up to the task of parenting ^b Worries about something bad happening to the baby ^{b,c} Anxious thoughts about things not being "just right" for your baby ^b Thoughts about doing harm to your baby ^b Worries about one's own health or well-being ^b Worries about one's partner's health or well-being ^b Guilty feelings if slept through the night without checking on baby ^c Panicky feelings if slept through night without checking on baby ^c Distress if could not check on baby (scale of 1–4) Checked the baby even though you knew everything was OK ^b Use (or planned use) of monitoring devices ^c Worries interfere with being able to keep mind on other things (scale of 0–3) Avoid things that may elicit negative thoughts about baby ^c Distress over intrusive thoughts (scale of 0–3) Control over intrusive thoughts (scale of 1–5) Effort to resist intrusive thoughts (scale of 1–4) Behaviors in response to worries: Reassure yourself ^c Distract yourself ^c Talk with others ^c Superstitions concerning the baby ^c
POSITIVE PARENTING	Sum of positive or negative adjectives describing experience of being a parent
POSITIVE BABY	Sum of positive or negative adjectives describing perception of baby

Note. CARE = thoughts and actions associated with parental caregiving; RELATIONSHIP = thoughts and actions associated with relationship building; PREOCCUPATION = Parental exclusive mental and behavioral focus on infant; AITHAB = anxious intrusive thoughts and harm avoidant behaviors experienced/performed by parents; POSITIVE PARENTING = perception of positive experience with parenting; POSITIVE BABY = perception of positive experience with baby.

^bItems scored for frequency: 0 (*absent*) to 4 (*very frequent*). ^cItem scored only as being present or absent: 0 (*absent*) or 1 (*present*).

BABY). These two domains were included to assess the process of idealization and reordering of priorities that are theoretically cited as key mental processes in the face of new attachments. Cronbach's α s were 0.85 for Time 1 and 0.86 for Time 2 for POSITIVE PARENTING, and 0.78 for Time 1 and 0.69 for Time 2 for POSITIVE BABY.

Ratings of frequency of the thought or action were estimated for the week prior to the interview. Frequency was rated on a 5-point scale (*none, rare, occasional, frequent, and very frequent*) with explicit anchor points (0–4). For example, the anchor for the rating of “rare” was made if the thought or action occurred “once or twice during the past week.” Estimates of time spent also were elicited. Examples include: “During the past week, on average how many hours a day did you spend in direct physical contact with your baby?”

In constructing the scores for CARE, RELATIONSHIP, PRE-OCCUPATION, and AITHAB, we summed all frequency or time data for each variable in each content domain. The scores for these frequency variables ranged from 0 (*none*) to 4 (*very frequent*). For other variables, we only recorded information concerning the presence or absence of particular thoughts or actions during the previous week. In these instances, a score of 0 (*absent*) or 1 (*present*) was used in the computation of the two domain scores. Maximum scores for each of these four domains are presented in Table 3.

Regarding positive thoughts about parenting or the baby (POSITIVE PARENTING and POSITIVE BABY), parents were asked to select from a list of adjectives that best typified their experience. This list included both negative and positive words; negative words were assigned a negative score, and positive words a positive score. The domain score was derived as the sum of these positive and negative scores.

Interviewers. Two interviewers were involved in this study. Both interviewers had extensive clinical experience, including many years working with expectant mothers in prenatal classes. One of the interviewers had participated in an earlier study with an earlier version of the YIPTA, in which the interclass R ranged from 1.0 to 0.97 (Leckman et al., 1999). The other interviewer of the current study was heavily trained by this interviewer. The consistency between the two interviewers was confirmed based on 10 interviews. The two interviewers listened to each other's interview, rated independently, and compared their interviews. Any discrepancies in their ratings were resolved by consensus.

Parental Sensitivity and Intrusiveness. Parent–infant interactions were coded using the Coding Interactive Behavior (CIB) Manual (Feldman, 1998). The CIB is a global rating system for adult–child interactions, with versions for newborns, infants, children, and adolescents. It consists of 42 adult, child, and dyadic codes, each rated on a scale of 1 (*a little*) to 5 (*a lot*). Interactions were videotaped at home and coded offline by trained coders. Overall, interrater reliability exceeded 90% on all codes ($\kappa > 0.82$). These scales are then aggregated into several composites. The CIB has been used in multiple studies and has shown sensitivity to infant age, interact-

ing partner, cultural variations, biological and social-emotional risk conditions, and the effects of interventions (Feldman, Eidelman, & Rotenberg, 2004; Feldman & Klein, 2003; Feldman, Masalha, & Nadam, 2001; Feldman, Weller, Sirota, & Eidelman, 2003; Kim et al., 2011). Parental sensitivity and intrusiveness assessed with the CIB has shown stability in repeated assessments across the first year (Feldman et al., 2004), from birth to 5 years (Feldman & Eidelman, 2009), and from 3 months to 13 years (Feldman, 2010), and sensitivity measured at 3 months predicted cognitive and socioemotional outcomes across childhood and up to adolescence (Feldman, 2010).

The Mother or Father Sensitivity construct used in this study includes the following (averaged) codes (mother $\alpha = 0.93$, father $\alpha = 0.91$): acknowledgement of child communications, vocal clarity, positive affect, gaze, appropriate range of affect, affectionate touch, resourcefulness, consistency of style, adaptation to child signals, and supportive presence. The scales in the Sensitivity construct define the parental sensitive-responsive style and include typical postpartum human-parenting behavior (gaze, affect, vocalizations, touch), a predictable style (consistency), and the adaptation of parental behavior to the infant's cues (adaptation, resourcefulness when infant is distressed, appropriate range of affect, implying that parents increase or decrease stimulation in accordance with infant signals, and supportive presence, assessing the degree to which mother presence provides a “regulatory” context for the child).

The Mother (or Father) Intrusiveness (mother $\alpha = 0.88$, father $\alpha = 0.84$) construct refers to a parental style that overrides the infant's signals and imposes the parental agenda and includes the following codes: parent's physical manipulation of infant's body, interruption of infant's activities, breaking gaze while infant is looking, disregard of infant's signals, and parent leading the interaction.

The Beck Depression Inventory (BDI). Widely used as an instrument to measure the severity of depressive symptoms (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961), the BDI consists of 21 items, with each item answered on a scale of 0 (meaning symptom not present) to 3 (meaning severe). Studies on the content, construct, concurrent, and factorial validity of this instrument have been extensive (Beck, 1967; Beck, Steer, Ball, & Ranieri, 1996; Beck, Steer, & Garbin, 1988). Test-retest reliability from various studies has ranged from 0.48 to 0.86 for clinical samples and 0.60 to 0.90 for nonclinical samples. Internal consistency was high—over 0.85 in both clinical and nonclinical samples (Beck, 1967; Beck et al., 1988). Cronbach's α s were 0.85 at Time 1 and 0.88 at Time 2.

The Spielberger State/Trait Anxiety Inventory (STAI). This instrument (Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983). Assesses an individual's current state of anxiety (state) with 20 questions and general anxiety proneness (trait) with 20 questions (Spielberger & Vagg, 1984). Items are rated on a scale of 1 (*almost never true*) to 4 (*almost always true*). Test-retest reliabilities reported in the test manual are, on average, greater than 0.75 (Spielberger, et al., 1983). Compared to other measures of anxiety, the STAI shows adequate validity. Cronbach's α values were 0.90 at

Time 1 and 0.91 at Time 2 for state anxiety and 0.41 at Time 1 and 0.49 at Time 2 for trait anxiety.

Data Analysis

First, a repeated measures ANOVA, with two time points (2–4 weeks and 3–4 months’ postpartum) as a within-subject factor and parent gender (mother and father) and parenting experience (first-time and veteran) as between-subject factors, was performed to compare parental mood (the BDI and the STAI) and parental thoughts and behaviors (the YIPTA-R) according to gender, parenting experience, and postpartum periods. Main effects and interactions between the factors were tested. Second, a two-way ANOVA, with parent gender (mother and father) and parenting experience (first-time and veteran) as between-subject factors, was used to compare parental sensitivity and intrusiveness between genders, and parenting experience and interactions between the two factors at 3 to 4 months’ postpartum. Third, the stepwise regression model was used to test the relationship between parent–infant interactions, parental mood, and parental thoughts and behaviors. The stepwise regression was used to identify a statistical model in which all predictors were significantly associated with parent–infant interactions. Eight variables, including parenting experience (first-time vs. veteran), six domains of the YIPTA-R (PREOCCUPATION, AITHAB, CARE, RELATIONSHIP, POSITIVE PARENTING, POSITIVE BABY) as main predictors, and three parental mood variables (the BDI, State and Trait Anxiety) as control variables were entered into the stepwise regression model. Interactions between parenting experience and other variables also were entered

into the model. This model accounted for maximal variance in parental behavior quantified as sensitivity and intrusiveness.

RESULTS

Demographics and Parental Mood

There were no differences in age, parental education, or infant gender between first-time and experienced parents. Parental ratings of depressive symptoms and state anxiety are presented in Table 1. There were no differences in BDI scores between first-time and experienced parents at either Time 1 (2–4 weeks’) or Time 2 (3–4 months’) postpartum. Mothers reported more depressive symptoms at Time 1 compared to fathers, $F(1, 42) = 7.48, p < .01$. Both mothers’ and fathers’ reports of depressive symptoms diminished by Time 2, $F(1, 42) = 15.52, p < .001$. There were no differences in state and trait anxiety between parents at either time point and, again, no differences between experienced and first-time parents.

The YIPTA-R: Comparisons of Gender and Parenting Experience

Table 3 presents the means for the composite variables derived from the parental thoughts and actions interview. As seen in Table 4, there were main effects for parent for every composite score. Mothers reported more caregiving thoughts and behaviors (CARE), $F(1, 49) = 49.75, p < .001$, more thoughts about their relationship with the baby (RELATIONSHIP), $F(1, 49) = 7.73, p < .01$, a greater degree of preoccupation (PREOCCUPATION),

TABLE 4. Comparison of Yale Interview of Parental Thoughts and Actions-Revised (YIPTA-R) between First-Time and Experienced Mothers and Fathers at Time 1 (2–4 Weeks’) and Time 2 (3–4 Months’) Postpartum

Composite Interview Domains	Mother				Father				F Parent	F Experience	F Visit
	First-Time		Experienced		First-Time		Experienced				
	Time 1	Time 2	Time 1	Time 2	Time 1	Time 2	Time 1	Time 2			
	<i>M (SD)</i>										
CARE	48.83 (18.41)	41.52 (11.43)	35.67 (15.95)	29.49 (7.62)	24.61 (10.06)	23.89 (12.94)	16.45 (6.25)	12.79 (4.50)	***	***	**
RELATIONSHIP	7.67 (2.11)	7.94 (1.89)	6.69 (2.50)	6.58 (1.16)	7.00 (2.85)	6.13 (2.13)	5.23 (1.59)	6.08 (1.38)	**	†	
PREOCCUPATION	29.28 (9.77)	23.85 (7.73)	18.15 (4.65)	16.50 (6.61)	20.0 (10.38)	16.63 (9.35)	11.04 (4.99)	8.64 (3.69)	***	***	**
AITHAB	1.05 (.31)	1.06 (.23)	1.05 (.27)	.83 (.19)	.98 (.26)	.88 (.24)	.77 (.24)	.69 (.21)	*	*	**
POSITIVE PARENTING	8.56 (7.52)	10.35 (7.52)	3.85 (2.76)	5.58 (3.34)	4.07 (2.28)	7.07 (5.01)	3.38 (3.91)	3.33 (1.30)	†	**	*
POSITIVE BABY	5.50 (3.31)	7.53 (2.83)	4.23 (3.11)	5.83 (2.12)	4.33 (2.16)	6.27 (2.81)	3.54 (3.10)	4.25 (1.48)	†	†	**

Note. Time 1 = 2–4 weeks’ postpartum, Time 2 = 3–4 months’ postpartum. CARE = thoughts and actions associated with parental caregiving; RELATIONSHIP = thoughts and actions associated with relationship building; PREOCCUPATION = Parental exclusive mental and behavioral focus on infant; AITHAB = anxious intrusive thoughts and harm avoidant behaviors experienced/performed by parents; POSITIVE PARENTING = perception of positive experience with parenting; POSITIVE BABY = perception of positive experience with baby.
 † $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

$F(1, 49) = 16.79, p < .001$ (Figure 1), and more anxious intrusive thoughts and accompanying harm avoidant behaviors responding to those thoughts (AITHAB), $F(1, 49) = 6.60, p < .05$. Mothers also tended to show more positive thoughts about parenting (POSITIVE PARENTING), $F(1, 49) = 3.84, p < .10$, and the baby (POSITIVE BABY), $F(1, 49) = 2.84, p < .10$, compared to fathers.

Compared to experienced parents, first-time parents showed higher levels of parental preoccupation and positive parenting thoughts. Both first-time mothers and fathers reported more caregiving thoughts and behaviors (CARE), $F(1, 49) = 11.06, p < .001$, higher degrees of preoccupation (PREOCCUPATION), $F(1, 49) = 19.73, p < .001$ (Figure 1), and more intrusive worries/harm avoidant behaviors (AITHAB), $F(1, 49) = 6.06, p < .05$, compared to experienced mothers and fathers. For first-time parents, their positive thoughts about parenting (POSITIVE PARENTING), $F(1, 49) = 7.14, p < .01$, the baby (POSITIVE BABY), $F(1, 49) = 3.81, p < .10$, and the emerging relationship (RELATIONSHIP), $F(1, 49) = 4.00, p < .10$, tended to start higher compared to more experienced parents and increase over 3 to 4 months.

Importantly, for both first-time and experienced parents, there was a shift between Time 1 and Time 2. Levels of preoccupations (PREOCCUPATION), $F(1, 49) = 9.59, p < .01$ (Figure 1), and worries about the baby (AITHAB), $F(1, 49) = 9.64, p < .01$, decreased. On the other hand, positive thoughts about the baby (POSITIVE BABY), $F(1, 49) = 13.81, p < .001$, and positive thoughts about the parenting role, (POSITIVE PARENTING), $F(1, 49) = 6.36, p < .05$, increased. Caregiving thoughts and behaviors (CARE), $F(1, 49) = 10.51, p < .01$, also decreased over time. However, the emerging relationship (RELATIONSHIP) stayed constant, $F(1, 49) = 0.07, n.s.$ No interactions between parental gender and time were significant.

Relationship Between the YIPTA-R and Parental Interactive Behavior

Table 5 shows the summary scores for the interactive parent–infant behavior between 23 of the participating mothers and fathers at Time 2. There were no significant differences in age, self-reports of depression/anxiety, or responses to the inventory of parental thoughts and behaviors between those parents who participated in the filmed interaction session and those who did not. Mothers tended to show more sensitivity to their infants' cues compared to fathers at Time 2, $F(1, 37) = 4.50, p < .05$.

Table 6 shows the results of the stepwise regression analysis aimed to model the relationships between parental thoughts and behaviors and parental interactive behaviors. For mothers, the only variable found to be significantly associated with higher maternal sensitivity is having fewer anxious intrusive thoughts and accompanying harm avoidant behaviors responding to those thoughts (AITHAB) whereas being a first-time mother, higher depressive scores, fewer positive thoughts about parenting (POSITIVE PARENTING), and more positive thoughts about the baby (POSITIVE BABY) were each uniquely predictive of maternal intrusiveness.

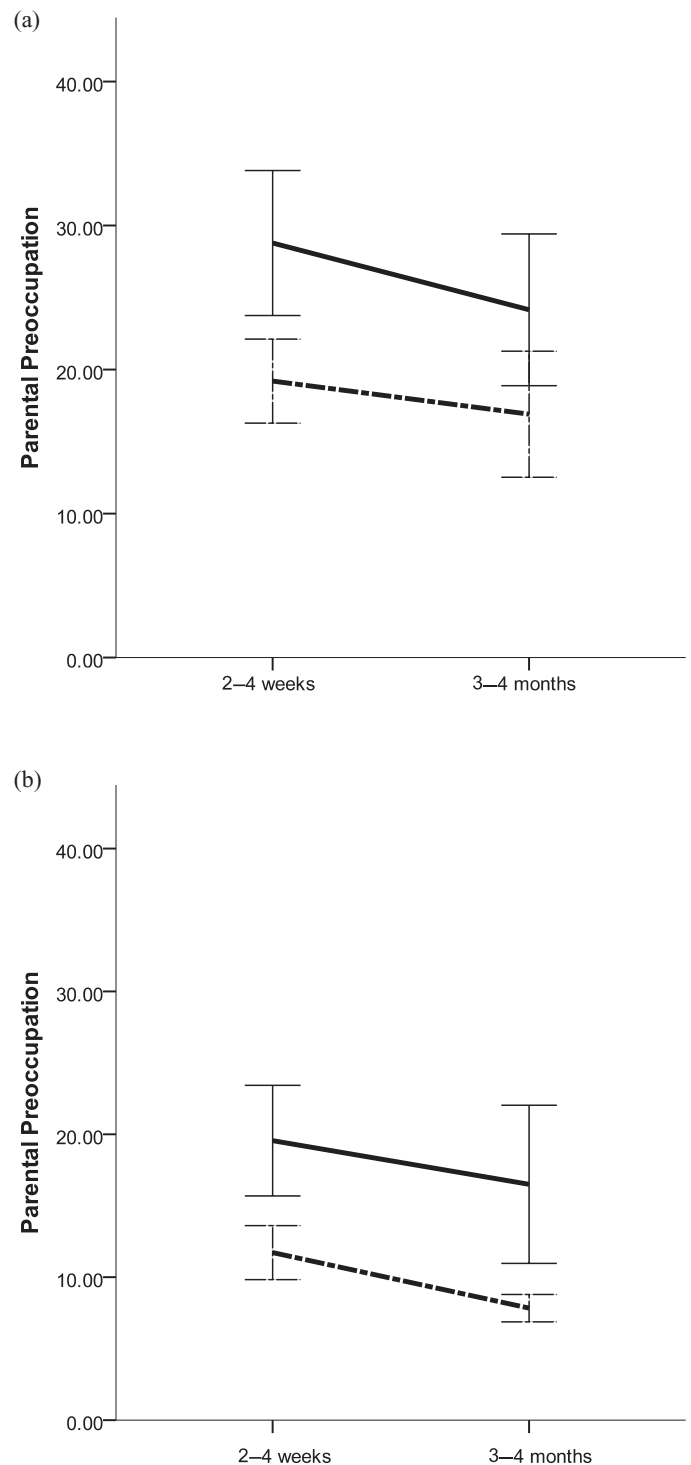


FIGURE 1. This graph shows changes in parental preoccupation from Time 1 (2–4 weeks) to Time 2 (3–4 months) postpartum among mothers (a) and fathers (b). The solid line represents first-time parents, and the dotted line represents the veteran parents.

For fathers, variables found to significantly predict higher paternal sensitivity include being an experienced father, having more intrusive thoughts and behaviors (AITHAB) and more caregiving

TABLE 5. Comparison of Parental Interactive Behaviors between First-Time and Experienced Mothers and Fathers

Composite Interaction Variables	Mother (n = 23)		Father (n = 23)		F Parent	F Experience
	First-time (n = 13)	Experienced (n = 10)	First-time (n = 13)	Experienced (n = 10)		
Sensitivity	4.26 (.47)	4.4 (.52)	3.78 (.78)	4.1 (.75)	4.5*	1.81
Intrusiveness	2.13 (.91)	1.77 (.57)	2.0 (1.0)	1.77 (.50)	.08	1.51

Sensitivity and Intrusiveness are based on the Coding Interactive Behavior (CIB) Manual, measured at Time 2 (3–4 months) postpartum Mean (SD). *p ≤ .05.

TABLE 6. Stepwise Regression Model for the Relationship between Parental Interactive Behaviors and Parental Thoughts at Time 2 (3–4 Months') Postpartum

Predictors	Maternal Sensitivity				Maternal Intrusiveness				Paternal Sensitivity				
	b (SE)	R ²	ΔF		Predictors	b (SE)	R ²	ΔF		Predictors	b (SE)	R ²	ΔF
AITHAB	-.98 (.40)	.25	-		Experience	-.79 (.35)*	.06	1.13		Experience	1.13 (.34)**	.01	1.24
					BDI	.09 (.04)*	.19	2.62		AITHAB	2.26 (.97)*	.12	3.15**
					POSITIVE PARENTING	-.08 (.03)*	.26	1.32		CARE	.06 (.02)**	.30	4.97*
					POSITIVE BABY	.18 (.09)†	.44	4.39†		POSITIVE PARENTING	-.24 (.09)*	.31	1.17
										POSITIVE BABY	-.13 (.09)*	.48	5.53*

Note. BDI = Beck Depression Inventory; CARE = thoughts and actions associated with parental caregiving. RELATIONSHIP = thoughts and actions associated with relationship building. PREOCCUPATION = Parental exclusive mental and behavioral focus on infant; AITHAB = anxious intrusive thoughts and harm avoidant behaviors experienced/performed by parents. POSITIVE PARENTING = perception of positive experience with parenting; POSITIVE BABY = perception of positive experience with baby. R² total (maternal sensitivity) = .25; F(1, 18) = 5.97, p < .05; R² total (maternal intrusiveness) = .44; F(4, 14) = 2.71, p < .10; R² total (paternal sensitivity) = .48; F(5, 13) = 4.27, p < .05. †p < .10. *p < .05. **p < .01. ***p < .001.

thoughts and behaviors, and having fewer positive thoughts about parenting (POSITIVE PARENTING) and the baby (POSITIVE BABY). However, no variable was found to predict paternal intrusiveness.

DISCUSSION

The current study had two aims. The first aim was to investigate the development of parental thoughts and behaviors among first-time and experienced parents in the early postpartum period. Results indicated that during the first postpartum weeks, both mothers and fathers tend to be preoccupied by caregiving thoughts about their infants. However, such preoccupation decreases over the next few months while positive thoughts about parenting and the infant increase. Mothers reported increased levels of parental thoughts in all areas compared to fathers. Similarly, first-time parents carry more intense parental thoughts in most of the areas than do experienced parents.

The second aim of our study was to test the relationship between parental thoughts and parent–infant interactive behaviors at 3 to 4 months' postpartum. Different patterns of associations with parental sensitivity and intrusiveness emerged for mothers and fathers. For instance, while higher anxious and intrusive thoughts about the baby are associated with lower parental sensitivity for

mothers, they are associated with higher parental sensitivity for fathers.

Results regarding the developmental trajectories of parental preoccupations and caregiving thoughts and behaviors from 1 to 3 months' postpartum constitute a close replication of previous work (Leckman et al., 1999). Both studies found a drop in parental caregiving thoughts and preoccupation about the baby from the first to the fourth postpartum month. It appears that during the first few weeks after the baby's birth, "typical" parents tend to be intensely preoccupied with thoughts of their infants (Leckman et al., 1999) and express high levels of concerns regarding their adequacy as parents, the burden to feed the baby regularly, the baby's general well-being, and harm coming to the infant. Driven by these concerns, parents frequently checked the baby's condition and intensely interacted with the baby, as suggested by high parental preoccupation and parental caregiving scores. Such intense interaction very early in postpartum may be important for the parents to create close ties with the baby (Feldman et al., 1999; Leckman et al., 2004; Leckman et al., 1999). Fortunately for most parents, their preoccupation and worries as well as caregiving and relationship building decrease by 3 to 4 months' postpartum. This may reflect changes in the parents' relationships with their infants, with decreased need for instrumental care and concern for basic health and sleep as well as increased

thinking around social interactions and increased confidence in parenting.

Positive thoughts about the baby and parenting role increased over time for mothers and fathers. Perhaps as the preoccupations with infant needs and health wane, parents are more capable of focusing on the positive and rewarding aspects of parenting and interactions with babies. Indeed, as they grow over the first postpartum months, infants spend less time crying and being fussy and more time playing and acting attentively (Bornstein et al., 1992). At the same time, by 3 months, as infants interact with their parents, they already can provide their parents with many attractive stimuli such as smiling, eye contact, cooing vocalization, and body movements (Papousek & Papousek, 2002). Possibly, as parents find it easier to feed and take care of their infants, the parenting experiences become more joyful and rewarding (Benedek, 1954). These positive experiences may play a role in the decrease in parental preoccupation and the increase in the positive thoughts about infants, as observed in the current study.

Consistent with previous findings (Leckman et al., 1999), mothers showed higher levels of early parental preoccupations, worries, and caregiving thoughts as well as positive thoughts about the parenting role and the baby, as compared to fathers. One possible explanation is that mothers tend to spend more time with their infants and have more caregiving responsibilities. However, even though fathers had lower levels on average compared to mothers, fathers showed similar changes to those mothers showed over time in their parental thoughts, suggesting common parental brain mechanisms (reviewed in Swain, 2011; Swain, Kim, & Ho, 2011). Thus far, maternal brain responses to infant cry have been correlated with levels of AITHAR (Swain et al., 2008), and postpartum brain structural changes with positive perceptions of own baby (Kim et al., 2010). Including fathers and other groups in future studies may lead to a brain-based understanding of caregivers to predict high risks and optimal treatments (Swain et al., 2012), as discussed later.

The current study also compared first-time and experienced parents (mothers and fathers) in terms of the levels of parental thoughts and interactive behaviors. First-time parents showed higher levels of parental thoughts and behaviors, as measured by early parental preoccupations, worries, caregiving thoughts, and positive thoughts about their parenting role and about their infants. Previous studies that focused only on mothers have reported similar findings and have suggested that first-time mothers may feel more anxious and less confident in parenting in the early postpartum period and thus may show greater anxiety during interactions with the infant, as compared to experienced mothers (Boukydis & Burgess, 1982). First-time mothers may also show greater anxiety with separation from their infants at birth (Seashore et al., 1973) and in response to infant cries (Bernal & Richards, 1970; Brockington, Aucamp, & Fraser, 2006; Robson & Kumar, 1980). However, to a certain extent, such anxiety may be beneficial to first-time parents in that it often drives them to intensely interact with their infants. Such intense interactions are critical to the development of the caregiving skills and positive thoughts required for

the development of parenting. After spending more time with their infants, first-time mothers gradually become less anxious, and the differences between them and experienced mothers may decrease significantly (Kaitz, Chriki, Bear-Scharf, Nir, & Eidelman, 2000). Few studies have compared first-time and experienced fathers in terms of parental thoughts and behaviors. The current study examined both mothers and fathers and found a similarity in terms of the changes during the first few months' postpartum period. Like first-time mothers, first-time fathers also are able to become less anxious over time and become more similar to experienced fathers.

At 3 to 4 months' postpartum, interactive behaviors between parents and infants were observed, and mothers showed higher sensitive behaviors as compared to fathers. This difference may be explained by the relatively more gradual and less immediate process through which fathers become attached to their infants over the first several months of parenting (Anderson, 1996). Throughout the first postpartum year, fathers develop a nurturing attachment with their infants through the reciprocal positive interactions with the infant (Pruett, 1998); such early father–infant reciprocity was found to be stable across childhood and up to adolescence and to predict adolescents' social competencies and dialogical skills (Feldman & Bamberger, 2009). Thus, the gradual learning and reinforcing values of relationships with the infant is important for developing sensitive parental behaviors in fathers.

The significant relationship between the YIPTA variables and parental sensitivity provides evidence for the association between early parental thoughts and interactive behaviors with infants at 3 to 4 months' postpartum. Maternal sensitivity was negatively associated with maternal anxious thoughts and worries. Higher levels of anxiety and worries may interrupt the mother's ability to interact with her infant in a more sensitive manner. Furthermore, higher levels of depressed mood, being a first-time mother, and fewer positive thoughts predicted more intrusive maternal behaviors. Earlier studies have found that maternal anxiety and depression may interrupt the development of sensitive parenting and emotional bonding with infants (Feldman, 2007). We also found that higher levels of positive thoughts about the baby were related to higher levels of mothers' intrusive interactive behaviors with infants. It was a surprising finding; however, an excessive amount of idealization about the baby may be related to greater levels of anxious and intrusive maternal behaviors. Further research is required to tease apart and fully understand these links.

The current study found that fathers' sensitivity toward their infants was associated with more anxious thoughts about the infant and more caregiving thoughts. It may be that for fathers, worries and caregiving thoughts at 3 months' postpartum may indicate more involvement in parenting. This also may be related to differences in parental sensitivity expressed in mothers and fathers. Studies have suggested that fathers' parental behaviors tend to be more intrusive and less responsive to infants' cues than those of mothers during interactions with their 7- to 13-month-old infants (e.g., Power, 1985). Other studies have suggested that the relationship between parental sensitivity and infant outcomes is subjective to the different ways in which sensitivity was measured and to

infant age (e.g., van Ijzendoorn & DeWolff, 1997). Thus, it is very important to follow these parents and infants when the infants are older and to examine the relationship between parental thoughts and sensitivity during different types of parent–infant interactions such as physical play.

Our results should be considered in light of the study's limitations. First, the parents of the study had mostly middle to high SES backgrounds and were Caucasian. In addition, the study had a relatively small sample size. Thus, the results of the current study may not be representative of other ethnicities, SES backgrounds, and mothers who are exposed to other risks. Future work is needed to understand parents who are at risk for providing lower quality parenting, such as parents who are adolescents, have had negative early experiences, or suffer from psychopathology. Second, this study focuses on a relatively narrow window of time. Changes may be very different during subsequent periods of development. Moreover, parental thoughts and behaviors may be affected by infants' behaviors and temperament. Thus, future studies should investigate the long-term trajectories of these parenting variables and their influences on the long-term developmental outcomes of families and their infants. Third, among experienced parents, the number and age range of the older children also may play a role in their experience. The small sample size of the experienced parents do not allow empirical testing of this question; however, it is important to learn what effects the amount of previous parenting experience and the older children may have on parents' cognitive and emotional processes during the early postpartum period. Fourth, the YIPTA-R also is a relatively new measure, and some of the domains had low alpha scores; thus, future work with a larger and more diverse sample will help establish reliabilities and validity of the measure and connect it with other assessments of maternal thoughts such as the Working Model of the Child Interview (Zeanah et al., 1993).

Clinical Implications

Even though the interview tools to date have not been used in postpartum mood disorders, the findings of the current study may carry several important clinical implications for the transition, prevention, and intervention to such problems. First, the findings of the current study suggest that during the first 4 months' postpartum, both mothers and fathers become less preoccupied and anxious about their infants. At 3 to 4 months' postpartum, high levels of anxious thoughts were related to low parental sensitivity, particularly in mothers. Thus, persisting high levels of preoccupations and worries may negatively affect maternal responsiveness and the development of close bonding with infants (Leckman et al., 2004; Leckman et al., 1999). Moreover, very high levels of intrusive thoughts and compulsive harm avoidant behaviors also may serve as the foundation of mood disorders, particularly OCD, which can have its initial onset in the postpartum period (Abramowitz et al., 2010; McGuinness, Blissett, & Jones, 2011). In fact, the PREOCCUPATION and AITHAB domains of the YIPTA and the YIPTA-R include many items from the Yale–Brown Obsessive Compulsive

Scale Checklist (Goodman et al., 1989) used in Abramowitz et al. (2010) and McGuinness et al. (2011). Parents with postpartum OCD are more likely to have more distressing and aggressive thoughts of hurting infants, and some of them may act on their aggression toward their infants (Speisman, Storch, & Abramowitz, 2011). Thus, it is highly critical to identify at-risk parents who have difficulties regulating preoccupation and anxiety concerning their infants. Measures can then be taken to help these parents deal with parental preoccupation and anxiety and reduce the risk of postpartum OCD.

Second, in the current study, we found that mothers and fathers felt more positively about their infants and parenting over time during the first 4 months' postpartum. The higher levels of positive parenting thoughts at 3 to 4 months' postpartum also were related to less intrusive parental behaviors, particularly among mothers. Thus, difficulties of feeling positive about parenting may be associated with inappropriate parental behaviors. The inability to find parenting rewarding and to feel positively toward infants also has been linked to the development of clinical depression among parents. Postpartum depression was associated with more withdrawn and unresponsive or hostile and intrusive behaviors during interaction, and these less responsive parental behaviors are associated with the long-term negative outcome of the infant (Field, 1992; Lovejoy, Graczyk, O'Hare, & Neuman, 2000). Our findings suggest the importance of identifying parents who have greater difficulties feeling positive about parenting during the early postpartum period and developing interventions to teach parents rewarding and positive values of parenting and interactions with their infants.

Finally, we found that being a first-time parent was associated with less paternal sensitivity and greater maternal intrusive parental behaviors. The findings indicate that first-time parents may experience greater challenges in regulating their thoughts and emotions during the early postpartum period, and thus need more attention and support from others. Thus, effective intervention strategies should target first-time parents' stress and anxiety so that their infants can receive the most responsive parenting and the best possible care. The YIPTA may help in other ways to tailor, follow, and optimize psychotherapeutic interventions for new parents.

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