

The development of parenting efficacy among new mothers and fathers

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Abstract:

Predictors of prenatal and postnatal parenting efficacy were examined in a sample of 115 primiparous mothers and 73 fathers in an effort to examine the association between preexisting parental characteristics and prenatal efficacy and the association between prenatal characteristics and postnatal efficacy when aspects of the current parenting context are taken into account. The most robust predictors of maternal postnatal efficacy included both prenatal efficacy, which significantly predicted postnatal efficacy independent of all other predictors including the current parenting context, and perceived infant temperamental reactivity as both a main effect and as buffered by social support. This was not the case for fathers, whose postnatal efficacy was primarily a function of their amount of involvement in parenting tasks and social support. The differential predictors of mother and father efficacy as well as their implications for future research are discussed.

Keywords: parenting efficacy | parental characteristics | prenatal and postnatal parenting

Article:

Parenting efficacy, or confidence in one's ability to meet the needs of a child, is related to a variety of positive outcomes for parents and children. In particular, parenting efficacy is positively associated with maternal adjustment (Williams et al., 1987), active maternal coping (Wells-Parker, Miller, & Topping, 1990), and sensitive or competent maternal behavior (Bugental, Blue, & Cruzcosa, 1989; Donovan, 1981; Donovan, Leavitt, & Walsh, 1990; Teti & Gelfand, 1991). Further, high efficacy buffers mothers from the negative effects of infant temperamental reactivity on maternal sensitivity (Leerkes & Crockenberg, 2003). Moreover, high parenting efficacy is positively related to adaptive social emotional and cognitive child outcomes (Coleman & Karraker, 2003; Donovan & Leavitt, 1989; Swick & Hassell, 1990). Together, these studies suggest that high parenting efficacy is linked to optimal parent well-being

and behavior and child development during infancy (see Coleman & Karraker, 1997, for a more comprehensive review). Despite this, few attempts have been made to identify the antecedents of parenting efficacy, particularly for fathers.

In this study, we identify prenatal characteristics and experiences that influence the expectation of parenting efficacy and examine these prenatal expectations in relation to postnatal efficacy, taking into account actual parenting experience and features of the parenting context for both mothers and fathers. This model is a combination and extension of two previous models of mothers' parenting efficacy (Leerkes & Crockenberg, 2002; Porter & Hsu, 2003), both influenced by Bandura's (1977) model of efficacy development.

THE PREDICTORS OF EFFICACY

According to Bandura (1977), several factors influence one's perceptions of efficacy. The strongest of these is performance attainment, such that behavior resulting in successful completion of a task enhances confidence in one's ability. This link between performance attainment and efficacy is influenced by task difficulty in that extreme task difficulty may undermine performance attainment and efficacy. *Vicarious experience*, or observing others complete similar tasks effectively, enhances efficacy through modeling but to a lesser extent than does one's own performance. Likewise, *verbal persuasion*, or being encouraged or praised by others, may enhance efficacy, albeit weakly because it is not based on direct experience and may in fact be counter to experience. Finally, emotional arousal affects efficacy beliefs because it provides individuals with information about how likely they are to succeed; that is, feeling tense and nervous is rarely associated with positive outcomes. Bandura proposed further that high efficacy in one domain can generalize to other domains.

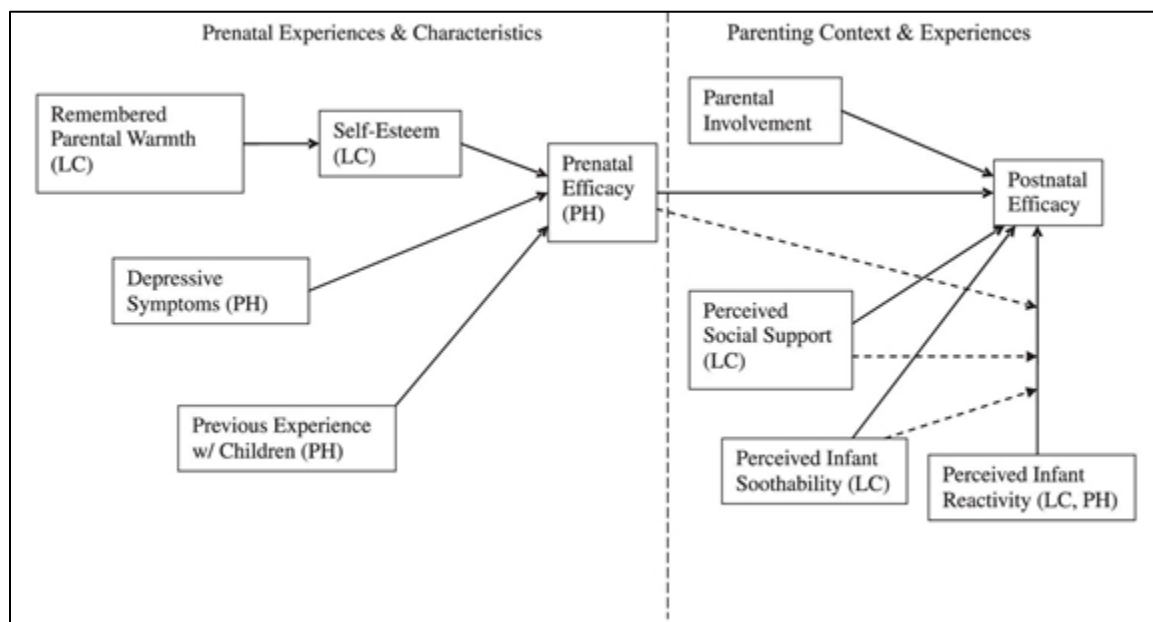


Figure 1. Proposed model of the predictors of prenatal and postnatal efficacy. Dashed lines indicate proposed moderating effects. LC indicates the predictor was included in the model tested by Leerkes and Crockenberg (2002) and PH indicates the predictor was included in the model tested by Porter and Hsu (2003).

The model of efficacy development used in this study, displayed in Figure 1, focuses on prenatal experiences and characteristics of parents as they relate to efficacy beliefs prior to the infant's birth and on changes in efficacy beliefs across the transition to parenthood as parents gain experience with their own infant, develop perceptions of their infant's temperament, and receive varying levels of social support for parenting tasks. Specifically, we propose that parents' recollection of their own parents' warmth during childhood will promote prenatal efficacy as a direct effect via vicarious experience and as an indirect effect through global self-esteem, which will then generalize to higher prenatal efficacy. We predict that the amount of experience with children will be positively associated with efficacy due to enhanced performance attainment, and depressive symptoms will correlate negatively with prenatal efficacy as negative emotional states undermine efficacy expectations. Next, we predict that remembered parental warmth, self-esteem, previous experience with children, and depression will similarly predict postnatal efficacy, but these effects will be mediated by prenatal efficacy expectations. We predict that prenatal efficacy will be strongly related to postnatal efficacy, but that change in efficacy will occur based on parenting experiences and features of the parenting context. In particular, the level of involvement of parents in child-care tasks and social support for parenting should enhance efficacy via performance attainment for the former and both verbal persuasion and reductions in task difficulty for the latter. Finally, parents' perceptions of infant temperamental reactivity may undermine efficacy via task difficulty particularly if other buffers (prenatal efficacy, social support, and infant soothability) are absent.

Although the same model is tested for mothers and fathers, there is reason to believe that the results may vary based on previously documented differences in mothers' and fathers' preparation for and sense of self during the transition to parenthood. That is, given evidence that men have fewer socialization experiences that prepare them for parenthood (e.g., babysitting: Goodnow, 1988; see Parke, 2002, for a comprehensive review) and that being a parent is a less central aspect of expectant fathers' identities than mothers' (Cowan & Cowan, 1992), it may be that prenatal experiences and characteristics are less predictive of fathers' efficacy than mothers' efficacy. In the next sections we summarize research that supports this model of efficacy development.

Prenatal Characteristics and Experiences

Adult personality characteristics and the childhood experiences that contributed to them likely affect efficacy beliefs. That is, individuals whose emotional needs are met during childhood develop secure working models in which they view themselves as lovable and worthy, contributing to a positive sense of self (Bowlby, 1973). In turn, a positive global sense of self may enhance parenting efficacy consistent with Bandura's (1977) view of domain generalization. Consistent with this view, Leerkes and Crockenberg (2002) reported that mothers whose own emotional needs had been met by their mothers in childhood had higher parenting efficacy at 6 months postpartum and this effect was mediated by self-esteem. Alternatively, positive interactions with parents in childhood may enhance efficacy directly through vicarious experience or by modeling successful parenting strategies that enhance parenting performance attainment (Bandura, 1977). Based on previous data suggesting that mothers' efficacy is most influenced by how their mothers treated them in childhood (Leerkes & Crockenberg, 2002) and

that fathers primarily model the behavior of their fathers (Cox et al., 1985), we predict that remembered parental warmth from the same-gender parent will predict parenting efficacy.

Depressive symptoms may also undermine efficacy expectations because of the negative pattern of cognitions and attributions that characterize depression. That is, expectant parents who experience elevated levels of depression may be inclined to make negative attributions about their parenting, feel helpless to meet the needs of an infant, and perseverate on feelings of inadequacy. Consistent with this view, a variety of previous research has linked depression and neuroticism to reduced efficacy (Bornstein et al., 2003; Cutrona & Troutman, 1986; Donovan & Leavitt, 1989; Gross, Conrad, Fogg, & Wothke, 1994; Porter & Hsu, 2003; Teti & Gelfand, 1991).

Given performance attainment is the strongest predictor of efficacy according to Bandura (1977), it seems likely that experience caring for other children should enhance parenting efficacy. Consistent with this view, Porter and Hsu (2003) reported a positive association between previous experience with children and prenatal but not postnatal efficacy. They argued that actual experience parenting one's own unique infant may make experience with other children less relevant to postnatal efficacy. Others have reported that knowledge of infant development is positively related to efficacy (Bornstein et al., 2003), and to the extent that experience with children contributes to this knowledge base, this is another likely mechanism by which previous experience with children may enhance parenting efficacy.

Finally, efficacy expectations are likely stable over time unless one encounters consistent experiences that disconfirm them. Consistent with this view, previous research has demonstrated stability in efficacy at multiple points in infancy (Elek, Hudson, & Bouffard, 2003; Hudson, Elek, & Fleck, 2001; Ruble et al., 1990). Most relevant to the current model, Porter and Hsu (2003) demonstrated that prenatal efficacy expectations predicted efficacy at 1 and 3 months postpartum. This stability in efficacy suggests that identifying the predictors of prenatal efficacy could be useful for intervention purposes; both to identify and target parents likely to experience low parenting efficacy and to identify strategies to enhance parenting efficacy prior to the birth of the infant.

Parenting Context and Experiences

Aspects of the parenting context, particularly infant temperament and social support, have also been examined as predictors of parenting efficacy by virtue of task difficulty and verbal persuasion. Infants perceived to be temperamentally reactive, defined as infants who are easily and intensely distressed for long periods of time (Rothbart, 1981; Thomas & Chess, 1977), may erode parents' feelings of confidence because they feel unsuccessful at soothing or engaging their infant, making parents feel threatened or anxious (Cutrona & Troutman, 1986; Gross et al., 1994; Raver & Leadbeater, 1999). In contrast, "easy" infants (i.e., those who are predictable, communicate their needs effectively, show less distress, and are sociable) may make parents feel good about their parenting by virtue of their positive response to their parents' efforts (Bornstein et al., 2003; Goldberg, 1977). Consistent with this view, Leerkes and Crockenberg (2002) reported negative associations among both infant distress to limits and to novelty with maternal efficacy. Furthermore, Porter and Hsu (2003) reported a negative association between negative

infant temperament and maternal efficacy that remained a trend at 1 month and statistically significant at 3 months, independent of previous measures of efficacy, further establishing the proposed link between perceived temperament and parenting efficacy. In addition to these main effects of temperamental reactivity, Leerkes and Crockenberg (2002) reported that infant soothability moderated the effect of temperamental reactivity on efficacy such that temperamental reactivity correlated negatively with efficacy only when soothability was low. Presumably an infant who is both easily distressed and difficult to soothe is most threatening to a parents' efficacy.

Social support has also been identified as a correlate of parenting efficacy. Instrumental social support, or direct assistance with parenting and other related household tasks, likely enhances parenting efficacy by reducing the difficulty of parenting and increasing the odds of performance attainment, whereas emotional support such as praise and encouragement may enhance efficacy through verbal persuasion and by reducing negative emotional arousal (Cutrona & Troutman, 1986; Leerkes & Crockenberg, 2002; Raver & Leadbeater, 1999). Moreover, social support can act to reduce the negative effect of infant reactivity on efficacy (Leerkes & Crockenberg, 2002), possibly by providing mothers with opportunities for respite from their infants allowing them to return to parenting refreshed and encouraging them to persist in their parenting efforts. In addition, given evidence that efficacy is stable over time, we examine the possibility that prenatal efficacy also buffers parents from the negative impact of temperamental reactivity because parents who enter parenthood feeling confident may be less likely to blame themselves for "failures" interacting with their reactive infants, facilitating their ability to persist longer and eventually succeed in their interactive goals.

Another potentially important aspect of the parenting context that has not been examined in relation to efficacy is the extent of parents' involvement in parenting tasks (e.g., feeding, bathing, comforting the infant). Presumably parents who engage in these tasks more frequently become more competent, which should enhance parenting efficacy through performance attainment (Bandura, 1977). This possibility is examined in this study.

THE PRESENT STUDY

In this study, we examine the development of parenting efficacy beliefs in mothers and fathers across the transition to parenthood, an important goal given consistent evidence that parenting efficacy is associated with adaptive parenting and child outcomes. Two features of this study are particularly significant. First, the inclusion of fathers is important because to our knowledge, no other studies exist that examine the predictors of fathers' efficacy during infancy, and inclusion of both parents allows for a substantive comparison of the processes that appear to affect efficacy development for each. Second, including measures of efficacy at both the prenatal and postpartum periods allows us to determine if they are consistent over time and if high prenatal efficacy buffers parents from the negative impact of a temperamentally reactive infant on postnatal efficacy. If so, knowledge about the antecedents of prenatal efficacy may be of clinical significance for those that provide early intervention services beginning in the prenatal period.

We hypothesize that remembered parental warmth from the same-sex parent, high self-esteem and low levels of depressive symptoms, and amount of prior experience with children will be

linked to high levels of parental efficacy measured prenatally, and self-esteem will mediate the association between remembered parental warmth and prenatal efficacy beliefs. These same factors are expected to be associated with efficacy beliefs measured postnatally, but these effects will be mediated by prenatal efficacy beliefs. Postnatally, degree of parental involvement with the child, social support, and parents' perceptions of infant temperamental characteristics will contribute to parental efficacy beliefs. Perceptions of infant soothability are expected to relate to positive efficacy beliefs, and perceptions of infant temperamental reactivity are expected to be linked to negative efficacy beliefs, but only under conditions of low prenatal efficacy, social support, or perceived infant soothability.

METHOD

Participants

Participants were 134 primiparous mothers and 90 of their partners living in or near a moderate-sized city in the southeastern United States. Of these, 120 mothers and 79 fathers, approximately 90% of the prenatal sample, also participated in the 6-month postnatal data collection. The demographics of these families (age, education, income, relationship length, and race) were compared to those who dropped out after the prenatal phase. Mothers and fathers who remained in the study were more likely to be White: $\chi^2(1, N = 134) = 4.62, p < .05$ for mothers; $\chi^2(1, N = 90) = 2.96, p < .10$ for fathers. Fathers who participated at both time points came from families with higher family incomes, $t(88) = 2.15, p < .05$. Excluded from analyses were 2 mothers who did not complete the questionnaires, 3 mothers under the age of 18, and 6 fathers who had children from a previous relationship. Thus, the final sample for this study consisted of 115 primiparous mothers and 73 primiparous fathers.

Mothers ranged in age from 19 to 38 years ($M = 28$); 71 % had a college degree, 19% had attended college, and 10% had a high school education or less. Of the mothers, 77% were White, 18% were African American, and 5% were multiracial or from other racial or ethnic groups. Fathers ranged in age from 21 to 43 years ($M = 31$); 70% had a college degree, 23% had attended college, and 7% had a high school education or less. Of the fathers, 86% were White, 12% were African American, and 2% were multiracial. Total family income ranged from \$6,000 to \$190,000 ($Mdn = \$65,000$). Seven women were single mothers. Of the remaining couples, 95% were married or living together and 5% were dating or engaged. Sixty-three infants (55%) were male. All infants were full-term and healthy.

Procedure

Parents were contacted through local birthing classes during the last trimester of pregnancy. Following a brief screening phone call confirming that mothers were primiparous, interested parents were mailed consent forms and measures of demographics, childhood history with their own parents, self-esteem, depression, and prenatal efficacy. Mothers returned all completed forms when they visited the Family Observation Room on campus for a prenatal interview. At 6 months postpartum, parents were mailed measures of infant temperament, social support, their relative involvement in child-care tasks, and parenting efficacy. Parents completed these

measures and mothers returned them when they visited the Family Observation Room with their infants for an interview as part of the larger study. Participating families received gift cards.

Measures

Prenatal Experiences and Characteristics

Demographics. Both parents completed a brief demographic form prenatally that asked them to describe their age, race, education, family income, and relationship with one another.

Remembered parental warmth. In the prenatal period, participants completed the Care subscale of the Parental Bonding Instrument (PBI; Parker, Tupling, & Brown, 1979), which assesses the acceptance and warmth participants remember receiving from their own parents during childhood. Twelve parental behaviors (e.g., "was affectionate to me") are rated on a 4-point scale, ranging from 1 (*very unlike*) to 4 (*very like*), indicating how much each statement describes each of the participant's parents. Items were averaged to derive scores of mothers' remembered maternal warmth and fathers' remembered paternal warmth ($\alpha = .94$ for both). The Care subscale has been shown to have acceptable test-retest reliability over a 3-week period (.76; Parker et al., 1979), and a 3-year period (Gotlib, Mount, Cordy, & Whiffen, 1988). Moreover, Parker (1981) found respondents' scores to correlate with their mothers' self-reports of parenting behavior at $r = .44$, demonstrating the validity of this retrospective measure of perceived parenting. Five fathers did not complete the scale about their fathers. These missing values were imputed based on fathers' ratings of remembered maternal warmth because the two correlated highly for the rest of the sample, $r(71) = .74, p < .001$. Correlations were calculated among all primary variables and fathers' remembered paternal warmth, both with and without these cases included; none differed substantially and therefore all fathers' data were included in analyses.

Global self-esteem. Participants completed the six-item Global Self-Esteem Scale (Messer & Harter, 1986) during the prenatal period. Parents rated which statement of a pair was most like them (e.g., "Some adults like the kind of person they are BUT other adults would like to be someone else") on a 4-point scale. This scale, ranging from *really true of me* to *sort of true for me*, has good internal reliability (range = .88-.92; Messer & Harter, 1986), and correlates positively with parents' perceptions of their adequacy as a provider (Harter, 1990). Responses were averaged for mothers' and fathers' self-esteem ($\alpha = .80$ and $.77$, respectively).

Depressive symptoms. Depressive symptoms were assessed prenatally using the 20-item Center for Epidemiologic Studies-Depression Scale (CES-D; Radloff, 1977), which consists of a checklist of moods, feelings, and cognitions associated with depression (e.g., "I felt depressed," "I felt that people dislike me") designed for use with community samples. Respondents indicate how often they felt a particular way during the previous week on a 4-point scale ranging from 1 (*rarely/never*) to 4 (*most of the time*). The CES-D demonstrates convergent validity with the Research Diagnostic Criteria, a standardized psychiatric interview, and with the Beck Depression Inventory (Spitzer, Endicott, & Robins, 1978). Items from the CES-D were averaged to derive measures of prenatal depressive symptoms for mothers and fathers (Cronbach's $\alpha = .85$ and $.82$, respectively).

Previous experience with children. During the prenatal period, parents completed a questionnaire on which they rated the amount of experience they had caring for or interacting with infants and also with older children using a 4-point scale ranging from 0 (*none*) to 3 (*a lot*). Parents were also asked to check off the types of previous experience they had interacting with children: caring for younger siblings, playing with neighborhood children, babysitting, volunteering, having a job involving children, or other. The experiences reported were summed to yield a measure of variety of experience with children. These three scores correlated significantly for mothers ($r_s = .37-.55, p_s < .001$) and fathers ($r_s = .38-.54, p_s < .001$) and were summed to yield measures of mothers' and fathers' previous experience with children (possible range= 0-12).

Parenting Context and Experiences

Parental involvement. Parents completed the Child Care Activities Scale (CCAS; Cronenwett, Sampselle, & Wilson, 1988) at 6 months postpartum. This measure asks parents to rate the relative amount of time they and their partners engaged in three types of child-care activities with their infants: direct care (8 items; e.g., feeding, bathing), indirect care (7 items; e.g., washing clothes, arranging babysitting), and play (6 items; e.g., reading, playing quietly). Scores ranged from 1 (*always mother*) to 5 (*always father*) with 3 indicating the task was shared equally by both. Items were averaged to yield overall measures of parental involvement in child care ($\alpha = .92$ for mothers and $.82$ for fathers). Mothers' ratings were reverse scored so that that high scores indicate high involvement for both mothers and fathers. The CCAS is stable over 6 to 8 weeks, and each parent's reports of each other's involvement at 5 months have been found to correlate significantly (Cronenwett et al., 1988). In this sample, mother and father reports also correlated positively, $r(71) = .71, p < .01$.

Perceived social support for parenting. The measure developed by Leerkes and Crockenberg (2002) was used to obtain an index of parents' satisfaction with social support regarding parenting from partners and from others at 6 months postpartum. The measure includes four items rated on a 5-point scale, ranging from 1 (*very dissatisfied*) to 5 (*very satisfied*), for partners and for other people in general: the amount of help with parenting, the quality of help with parenting, the amount of support given in return, and the amount of positive feedback received about parenting. Responses about partners and others were averaged to yield an overall measure of perceived social support ($\alpha = .81$ for both mothers and fathers).

Perceived infant temperament. The Infant Behavior Questionnaire-Revised (IBQ-R; Gartstein & Rothbart, 2003) was administered at 6 months postpartum to assess parents' perceptions of their infant's temperament. Two subscales that address the concept of infant temperamental reactivity or "difficulty" were used in this study: Distress to Limitations, which reflects proneness to frustration (16 items), and Soothability, which reflects the ease with which infants are calmed when distressed (18 items). Each item, describing the frequency of infant responses to particular situations, is rated on a scale from 1 (*never*) to 7 (*always*). Interrater reliability between mothers and fathers or other secondary care providers and internal consistency have been established in this and previous versions of the IBQ (Gartstein & Rothbart, 2003; Rothbart, 1981). Convergent validity with home observations of temperament and parent reports of temperament on the Revised Infant Temperament and Infant Characteristics Questionnaires were demonstrated on similar previous versions of these subscales (Goldsmith, Rieser-Danner, & Briggs, 1991;

Rothbart, 1981; Rothbart & Goldsmith, 1985). Within each subscale, items were averaged; α s were .75 and .74 for mothers' and .71 and .73 for fathers' perceptions of distress to limits and soothability, respectively.

Parenting efficacy beliefs. The 10-item Parenting Efficacy Scale (Teti & Gelfand, 1991), as modified for use by Leerkes and Crockenberg (2003), was used as an index of parents' beliefs in their own competence as parents. In the prenatal version, parents are asked to imagine themselves as parents and rate how good they think they will be at various child-care activities using a 4-point scale ranging from 1 (*not good at all*) to 4 (*very good*). Nine of the items refer to specific behaviors (e.g., feeding, bathing, soothing, etc.), and the other item is a global evaluation of parenting ability. Items were averaged to obtain measures of prenatal maternal ($\alpha = .86$) and paternal efficacy ($\alpha = .84$). In the postnatal version, parents are asked to rate how good they felt they were on the same set of items, which were averaged to yield measures of postnatal efficacy ($\alpha = .80$ for mothers and .74 for fathers).

RESULTS

Preliminary Analyses

Descriptive statistics for all variables are shown in Table 1. Independent group *t* tests showed no differences in key study variables based on race (White vs. minority). Correlations between other demographic variables and the study variables showed that family income, maternal age, and maternal education correlated positively with one another, $r(117) = .53$ to $.69$, all $p < .01$; all three correlated negatively with maternal prenatal efficacy, $r(117) = -.21$ to $-.26$, all $p < .05$; and age and education also correlated negatively with maternal postnatal efficacy, $r(117) = -.25$ and $-.19$, $p < .05$, respectively. For fathers, none of the demographic variable correlated with prenatal efficacy, but education correlated negatively with postnatal efficacy, $r(72) = -.33$, $p < .01$, as did infant gender, $r_{pb}(72) = -.41$, $p < .01$. Fathers of daughters reported feeling less efficacious than fathers of sons. To maintain comparable models of mother and father efficacy, mother and father education were entered as covariates in subsequent analyses of prenatal and postnatal efficacy, and infant gender was entered as a covariate in analyses of postnatal efficacy.

Table 1. Descriptive Statistics.

Questionnaire	Mothers ^a		Fathers ^b	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Remembered parental warmth	3.48	.57	3.19	.70
Self-esteem	3.35	.55	3.25	.58
Depressive symptoms	0.07	.02	.07	.02
Experience with children	7.31	2.40	4.88	2.13
Prenatal efficacy	3.35	.38	3.29	.37
Parental involvement	3.76	.48	2.53	.34
Perceived social support	4.23	.58	4.37	.49
Perceived distress to limits	3.20	.71	3.30	.61
Perceived soothability	5.07	.60	4.78	.59
Postnatal efficacy	3.64	.30	3.33	.37

^a*n* = 115. ^b*n* = 73.

Correlations among predictor variables were examined to determine if the conditions necessary to test proposed mediating effects were met. These are reported in Table 2 with correlations among mother variables above the diagonal, correlations among father variables below the diagonal, and correlations among parallel mother and father variables on the diagonal. For mothers, remembered maternal warmth and self-esteem correlated positively with each other and with both prenatal and postnatal efficacy beliefs. For fathers, remembered paternal warmth correlated with prenatal and postnatal efficacy beliefs, but self-esteem did not. Thus, conditions were met to test the hypothesis that prenatal efficacy mediates the association between remembered paternal warmth and postnatal efficacy, but the hypothesis that self-esteem would mediate between remembered paternal warmth and prenatal efficacy was not supported.

Table 2. Zero Order Correlations Among Predictor Variables and Parenting Efficacy

<i>Variables</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>
1. Remembered parental warmth	<i>.01</i>	.43**	-.26**	.17 [†]	.18*	-.06	.22*	-.03	.21*	.20*
2. Self-esteem	.11	<i>.31**</i>	-.42**	.13	.27**	.06	.15	-.06	.11	.27**
3. Depressive symptoms	.11	-.48**	<i>.25*</i>	-.04	-.14	.04	-.15	-.01	.02	-.07
4. Experience with children	.14	-.09	.18	<i>.09</i>	.37**	.03	.20*	.02	.23*	.20*
5. Prenatal efficacy	.31*	.08	-.11	-.02	<i>.10</i>	.08	.25**	.02	.10	.43**
6. Parental involvement	.14	-.10	-.06	.34**	.09	<i>-.71**</i>	-.36**	-.03	-.05	.09
7. Perceived social support	.22 [†]	.21 [†]	-.07	.20 [†]	.22 [†]	.30*	<i>.52**</i>	-.03	-.07	.22*
8. Perceived distress to limits	-.07	-.11	.03	-.07	-.03	-.09	-.23*	<i>.39**</i>	-.09	-.34**
9. Perceived soothability	-.14	.02	-.04	-.02	.26*	.18	.06	-.27*	<i>.12</i>	.31**
10. Postnatal efficacy	.23*	.18	-.22 [†]	.11	.34**	.52**	.59**	-.14	.19	<i>.26*</i>

Note. Correlations among mother variables appear above the diagonal ($n = 115$), correlations among father variables appear below the diagonal ($n = 73$), and correlations between parallel mother and father variables appear in italics along the diagonal ($n = 73$).

[†] $p < .10$. * $p < .05$. ** $p < .01$.

Factors Associated With Prenatal Efficacy Beliefs

Hierarchical regression analyses were used to test the independence of proposed main effects and to test the proposed mediated effects on prenatal efficacy beliefs of mothers and fathers. The control variables of education and remembered parental warmth were entered in the first step, self-esteem was entered by itself as a second block to determine if any association between remembered parental warmth and prenatal efficacy was reduced with the entry of self-esteem, and depressive symptoms and previous experience with children were entered as the third block. Given conventional effect size standards (Cohen, 1988) and the sample size, statistical power for identifying small effects (i.e., individual beta coefficients within the model) is limited in this sample ($< .20$ for both mothers and fathers); however, power is adequate to detect medium (.79 for fathers, .92 for mothers) and large effects (.99 for fathers and mothers). Results of these analyses are shown in Table 3.

Mothers. Remembered maternal warmth was linked to prenatal efficacy controlling for maternal education. When self-esteem was entered into the equation, the relation between remembered maternal warmth and efficacy beliefs dropped to nonsignificance. Sobel's test (Baron & Kenny, 1986; Kline, 1998) was used to test the significance of the indirect effect of remembered maternal warmth on prenatal efficacy through self-esteem and the results were significant, $\beta = .11$, $z = 2.95$, $p < .01$. Thus, consistent with the hypothesis, the association between remembered maternal warmth and mothers' prenatal efficacy beliefs was mediated by self-esteem. Also

consistent with the hypotheses, experience with other children predicted maternal prenatal efficacy independent of all other variables in the model. Depressive symptoms, however, were unrelated to mothers' prenatal efficacy beliefs. The overall model accounted for 18% (adjusted R^2) of the variability in mothers' efficacy measured prenatally, $F(114) = 6.06$, $p < .01$.

Table 3. Hierarchical Multiple Regressions Predicting Prenatal Efficacy

<i>Predictors in each Block</i>	<i>Mothers</i>			<i>Fathers</i>		
	<i>Block 1</i>	<i>Block 2</i>	<i>Block 3</i>	<i>Block 1</i>	<i>Block 2</i>	<i>Block 3</i>
1. Education	-.19*	-.22*	-.18*	-.21 [†]	-.22 [†]	-.22 [†]
Remembered parental warmth ^a	.19*	.08	.03	.34**	.34**	.36**
2. Self-esteem		.26**	.22*		.08	.01
3. Depressive symptoms			-.03			-.15
Experience with children			.31*			-.02
Adjusted $R^2\Delta$ for each block	.05*	.05*	.08**	.11*	.00	.00
Total model adjusted R^2			.18**			.11*

Note. $n = 115$ for mother analysis; $n = 73$ for father analysis.

^aRemembered parental warmth is maternal warmth for mother analysis and paternal warmth for father analysis.

[†] $p < .10$. * $p < .05$. ** $p < .01$.

Fathers. The same model was tested for fathers with results shown in Table 3. The significant direct effect of remembered paternal warmth on fathers' prenatal efficacy was independent of all other variables in the model. None of the other variables was significantly associated with fathers' efficacy beliefs. The model was statistically significant, $F(72) = 2.58$, $p < .05$, and accounted for 11 % (adjusted R^2) of the variability in fathers' efficacy beliefs measured prenatally.

Factors Associated With Postnatal Efficacy

Separate hierarchical multiple regressions were calculated for mothers' and fathers' postnatal efficacy to determine the independence of simple effects, to test mediation, and to test interaction effects. As before, education was entered as a covariate in the first block along with remembered parental warmth, self-esteem, prenatal depression, and previous experience with children to determine which of these prenatal experiences remained as independent predictors of postnatal efficacy. Prenatal efficacy was entered in the second block to determine if it mediated the association between the other prenatal variables and postnatal efficacy. Finally, the parenting context variables were entered in the third block (infant gender, parental involvement, social support, distress to limits and soothability, distress to limits x prenatal efficacy, distress to limits x social support, and distress to limits x infant soothability). Moderating effects were tested and interpreted using procedures outlined by Aiken and West (1991). That is, variables were centered prior to creating interaction terms and significant interactions were interpreted by calculating simple slopes between distress to limits and postnatal efficacy at 1 *SD* above and below the mean of the moderating variable. Significance of interaction effects was calculated independent of main effects only. Trend-level interaction effects are interpreted given evidence that the ability to detect interaction effects is undermined in nonexperimental research (McClelland & Judd, 1993).

This model included 14 predictors, meeting the liberal criteria that N (115 for mothers and 73 for fathers) exceed the number of predictors by 50 (Harris, 1985). However, given conventional effect size standards (Cohen, 1988) and the sample size, statistical power for identifying small effects (i.e., individual beta coefficients within the model) is limited in this sample ($< .18$ for both mothers and fathers); however, power is reasonably adequate to detect medium effects for fathers (.70), and is good to detect medium effects for mothers (.89) and large effects for both mothers and fathers (.99). Results appear in Table 4, with standardized betas displayed at each block, and are described next.

Table 4. Hierarchical Multiple Regressions Predicting Postnatal Efficacy

Predictors in Each Block	Mothers			Fathers		
	Block 1	Block 2	Block 3	Block 1	Block 2	Block 3
1. Prenatal characteristics						
Education	-.24**	-.18*	-.18*	-.41**	-.37**	-.21*
Remembered parental warmth ^a	.09	.08	-.02	.28**	.21 [†]	.12
Self-esteem	.27*	.19 [†]	.18 [†]	.11	.11	.06
Depressive symptoms	.06	.07	.03	-.23 [†]	-.20 [†]	-.12
Experience with children	.13	.02	-.05	.16	.17	-.01
2. Prenatal efficacy		.34**	.32**		.19 [†]	.15
3. Parenting context						
Infant gender			-.09			-.14
Parental involvement			.08			.30**
Perceived social support			.14			.36**
Perceived distress to limits			-.31**			.04
Perceived soothability			.24**			.03
Limits × prenatal efficacy			.12			.17 [†]
Limits × social support			.15 [†]			-.05
Limits × soothability			.11			-.03
Adjusted $R^2\Delta$ for each block	.12**	.08**	.20**	.23**	.02 [†]	.31**
Total model adjusted R^2			.40**			.56**

Note. $n = 115$ for mother analysis; $n = 73$ for father analysis.

^aRemembered parental warmth is maternal warmth for mother analysis and paternal warmth for father analysis.

[†] $p < .10$. * $p < .05$. ** $p < .01$.

Mothers. As illustrated in Table 4, when entered simultaneously, maternal education and self-esteem were the only significant prenatal predictors of maternal postnatal efficacy. Both of these continued to predict postnatal efficacy after the entry of prenatal efficacy in Block 2, although self-esteem dropped to a trend lending support for partial mediation. Based on Sobel's test, the indirect effect of self esteem on postnatal efficacy through prenatal efficacy was a trend, $\beta = .08$, $z = 1.89$, $p < .10$. Further, education and prenatal efficacy remained significant predictors and self-esteem remained a trend even after entry of the parenting context variables.

Of the parenting context variables in Block 3, infant distress to limits, soothability, and the interaction between social support and distress to limits were the only factors that predicted maternal efficacy independent of other predictors in the model and each effect was in the predicted direction. Simple slope analysis of the interaction effect indicated that the simple

negative association between infant distress to limits and maternal efficacy was significant when social support was low, $\beta = -.41$, $p < .001$, but was not significant when social support was high, $\beta = -.13$, *ns*. Thus, social support buffers mothers from the negative effect of infant distress to limits on parenting efficacy at 6 months as predicted. This model accounted for 40% (adjusted R^2) of the variability in maternal postnatal efficacy, $F(114) = 6.49$, $p < .01$.

Fathers. As demonstrated in Table 4, of the prenatal variables in Block 1, education, remembered paternal warmth, and depression (as a trend) predicted fathers' postnatal efficacy independent of one another. Each of these effects remained after entry of prenatal efficacy, which was itself a trend, although the effect of remembered paternal warmth dropped to a trend suggesting partial mediation by prenatal efficacy. However, the indirect effect of remembered paternal warmth through prenatal efficacy was not significant based on Sobel's test, $\beta = .07$, $z = 1.49$, *ns*, indicating the effect of remembered paternal warmth on postnatal efficacy was direct. After entry of the parenting context variables in Block 3, only paternal education remained a significant predictor. Contrary to the results for mothers, but consistent with the hypothesis, father involvement and social support were strong independent predictors of postnatal efficacy. Although there were no direct effects of infant temperament on fathers' postnatal efficacy, there was a significant interaction between distress to limits and prenatal efficacy. Consistent with the hypothesis, when prenatal efficacy was low, the association between distress to limits and postnatal efficacy was negative, $\beta = -.11$, *ns*, but when prenatal efficacy was high, the association between distress to limits and postnatal efficacy was positive, $\beta = .21$, *ns*. The full model accounted for 56% (adjusted R^2) of the variability in paternal efficacy, $F(72) = 7.48$, $p < .01$.

DISCUSSION

These results support and extend the models of parenting efficacy proposed by Leerkes and Crockenberg (2002) and Porter and Hsu (2003) by demonstrating that parenting efficacy is a function of both prenatal characteristics and the current parenting context for mothers, but is primarily a function of parenting context and experience for fathers. This model accounted for 40% and 56% of the variability in maternal and paternal postnatal efficacy, respectively. Importantly, this study is one of few that examine both prenatal and postnatal efficacy development and is the only one that does so for both mothers and fathers, demonstrating that the specific predictors of each vary.

Predictors of Mothers' Parenting Efficacy

For mothers, prenatal efficacy was predicted by remembered parental warmth as mediated by self-esteem, consistent with Leerkes and Crockenberg's (2002) results and the view that having one's emotional needs met in childhood leads to a positive sense of self (Bowlby, 1973), which generalizes to a positive view of self as a mother consistent with domain generalization (Bandura, 1977). In addition, and consistent with the current model and Porter and Hsu's (2003) results, previous experience with children predicted prenatal maternal efficacy but not postnatal efficacy. It may be that success at interacting with other children, one type of performance attainment, contributes to the expectation of parenting success prenatally, but these experiences become less important in the wake of actual success or failure in interacting with one's own unique child. Moreover, consistent with Porter and Hsu's findings, prenatal efficacy predicted

postnatal maternal efficacy, demonstrating that mothers enter parenthood with expectations that are fairly stable. Further, consistent with the hypothesis, prenatal efficacy partially mediated the positive association between self-esteem and postnatal efficacy for mothers, and the effect of prenatal efficacy was independent of the current parenting context and was the most robust predictor of maternal postnatal efficacy, underscoring the importance of identifying the antecedents of mothers' prenatal efficacy expectations.

Also consistent with the proposed model, perceived infant temperamental reactivity was related to maternal efficacy as a main effect, supporting the view that the context of parenting, in this case the difficulty of the task, or how easily distressed and soothed infants are, affects how confident mothers feel in their parenting. Moreover, infant distress to limits was not negatively related to postnatal efficacy if social support was high, supporting Crockenberg's (1986; Crockenberg & Leerkes, 2003) view that the effect of temperamental reactivity on mothers varies depending on the presence or absence of other supports. That infant soothability did not buffer mothers' efficacy from infant distress to limits is contrary to the finding reported by Leerkes and Crockenberg (2002) and may be a function of mean differences in the two samples. That is, mothers' reports of distress to limits were significantly higher in this sample, whereas their reports of soothability were significantly lower than in Leerkes and Crockenberg's sample; thus high infant soothability in this sample may not have been high enough to buffer mothers from higher levels of perceived infant distress to limits.

That maternal involvement in child-care tasks was unrelated to individual differences in maternal efficacy may be a function of threshold effects. All but one mother reported performing more than half of the parenting tasks. In contrast, father involvement in parenting ranged from virtually none to slightly more than half, and this end of the continuum seems more likely to reap differences in performance attainment and perceived parenting efficacy. Likewise, that depression, an indicator of emotional arousal, did not undermine efficacy may be a function of sample characteristics in that the range of depression scores was limited in this low-risk sample.

Although not hypothesized, education correlated negatively with maternal efficacy. Perhaps better educated women are accustomed to feeling successful in the pursuit of their education and career goals and feel less efficacious about their parenting because infant behavior seems less controllable than other domains of life. Alternatively, more educated parents may be exposed to or seek out more information about parenting and child development, which could make the task appear more difficult (i.e., they may have unusually high standards for themselves and their infant's development); cause them to be more reflective about parenting, contributing to more self-doubt and an increase in parenting stress; and inadvertently undermine parenting efficacy. Education was negatively related to paternal efficacy also, but the other predictors of fathers' efficacy were markedly different than predictors of mothers' efficacy.

Predictors of Fathers' Parenting Efficacy

The only significant predictor of father prenatal efficacy was remembered paternal warmth, and inconsistent with the results for mothers, this effect was direct rather than mediated, suggesting the vicarious experience or modeling was the mechanism by which remembered paternal warmth enhanced prenatal efficacy. Unlike mothers, previous experience with children was unrelated to

prenatal efficacy for fathers, likely because fathers had approximately half as much experience as mothers, an amount that may be insufficient to bolster feelings of parenting efficacy. This gender difference in preparation for parenthood is consistent with previous research (Parke, 2002). That relatively little variability in fathers' prenatal efficacy was accounted for by the proposed model may not be of practical concern given that prenatal efficacy did not strongly predict fathers' postnatal efficacy. It may be that fathers enter parenthood with a less coherent view of themselves as parents than do mothers, consistent with evidence that fathering is not as large a part of a man's identity as it is for a woman during pregnancy and parenthood (Cowan & Cowan, 1992).

Parenting context variables did predict fathers' postnatal efficacy, but the pattern of results was quite different than for mothers in that father involvement and social support were the strongest predictors of paternal efficacy, neither of which operated as main effects for mothers. That father involvement in child-care tasks was a strong predictor of father efficacy at 6 months suggests that practicing parenting increases feelings of efficacy via performance attainment. This may be especially important in light of fathers' relatively little prior experience with infants and children relative to mothers. That social support was positively associated with fathers' efficacy is consistent with the model and previous research on mothers' efficacy development (Cutrona & Troutman, 1986; Leerkes & Crockenberg, 2003). This association may be due to verbal persuasion and encouragement that fathers are good parents or by reductions in the task difficulty of parenting by virtue of instrumental parenting support. That social support predicted father but not mother efficacy as a main effect in this sample is interesting. Perhaps fathers' efficacy is more responsive to verbal persuasion than mothers' efficacy because fathers have less prior information available about their likely performance attainment in parenting tasks given less previous experience with children. Alternatively, instrumental parenting support may have a greater impact on fathers because they engage in relatively less hands-on infant care than mothers, who may require more extensive support to see a benefit on efficacy beliefs.

Finally, unlike for mothers, perceived infant temperamental reactivity was only weakly related to fathers' efficacy, and only in conjunction with prenatal efficacy, not as a main effect. Perhaps parenting a reactive infant has a stronger negative effect on mothers' efficacy because they spend more time in direct contact with their infants, perhaps having fewer opportunities for respite, making this characteristic more of a challenge for them.

In sum, there was support for each element of the proposed model (see Figure 1) in relation to either mothers' or fathers' efficacy development with one exception: Depressive symptoms were unrelated for both parents. Mothers' postnatal efficacy was predicted by both prenatal experiences and perceived infant temperament. In contrast, fathers' efficacy beliefs were primarily a function of involvement in child-care tasks and social support for parenting.

Limitations and Directions for Future Research

Several factors limit the conclusions drawn from this study. First, this is a relatively high-functioning, homogenous sample, and results may vary for more at-risk samples. Second, the sample of fathers is small and less diverse relative to the sample of mothers. Third, attrition was higher among minority parents, precluding examination of race as a moderator and further

limiting generalizability of these results. Fourth, there was inadequate power to detect small effects, particularly in the father analyses. Finally, although parent report is necessary as the concepts under consideration are perceptions of self, others, and relationships, it is important to note that resulting associations with efficacy may be inflated by source variance. Nevertheless, the results of this study support and expand on preexisting models of maternal efficacy and lay the groundwork to understanding the origins of paternal efficacy. Important avenues for future consideration include identifying other predictors of maternal efficacy during the prenatal period, given it is such a robust independent predictor of postnatal efficacy, which has been linked with parenting competence in other studies (Donovan et al., 1990; Hess, Teti, & Hussey-Gardner, 2004; Teti & Gelfand, 1991). Other potential correlates to consider include whether or not the pregnancy was planned, mothers' concerns about work and family balance given evidence that work hours correlate negatively with perceived parenting competence (Bornstein et al., 2003), and their exposure to salient positive parental role models other than their own mothers. In addition, a more detailed measure of previous experience with children that taps into the specific timing, content, and length of previous experience (e.g., babysitting sporadically as a teenager may affect efficacy expectations differently than being a full-time nanny for a summer) may be useful. It would be interesting also to explore the process by which partners support or undermine each other's parenting efficacy during the transition to parenthood via coparenting (e.g., support, undermining, and gatekeeping could be particularly relevant; Belsky, Woodworth, & Crnic, 1996; McHale et al., 2004; Van Egeren, 2004). Comparing the predictors of domain-specific parenting efficacy (Coleman & Karraker, 1997) is important as well; that is, predictors of confidence in basic care, emotional responding, and socialization skills, all different aspects of parenting, may vary. Finally, and perhaps most important, it remains to be seen if paternal efficacy is predictive of the quality of observed fathering behavior or child outcomes as has been shown to be the case for mothers. These efforts should be made in samples that are larger and more diverse with respect to race, culture, and risk factors than the sample in this study. Particular attention should be paid to the possibility that the nature of the association between the constructs examined in this study and parenting efficacy varies by race.

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