

Enhancing Parenting Practices of At-risk Mothers

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Abstract This study evaluated the effectiveness of an intervention designed to improve early parenting by increasing understanding of infant developmental needs and promoting maternal responsiveness as indicated by increased positive behavior support for infants and decreased psychological control. At-risk mothers were randomly assigned to control or treatment conditions, the latter consisting of training in parental responsiveness, developmental knowledge, and loving touch. Following the intervention, treatment mothers reduced their controlling tendencies; they were less rigid, less intrusive, and more flexible than control mothers. Treatment mothers provided more parental support indicated by higher quality verbalizations, more demonstrative teaching, and lower role-reversal tendencies. *Editors' Strategic Implications:* Further replication will be necessary, but the results for the “My Baby

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and Me” program are promising. The authors provide crucial information for parent educators about the pairing of basic knowledge transfer with the active engagement of parents with their infants in practicing new parenting skills.

Keywords Prevention · Intervention · Infancy

Although all mothers face challenges in raising their children, some struggle more in learning about and using effective parenting practices (Whitman et al. 2001). Although the risks for problematic parenting often stem from a lack of adequate supports, they rarely occur in isolation. For instance, maternal risk characteristics such as poverty, low education levels, single parenting, and teen parenting often co-occur (Cairney et al. 2003; Turley 2003). Cumulative parenting risks during early childhood are especially troublesome because they have been shown to predict children’s social–emotional outcomes during middle childhood and adolescence (Appleyard et al. 2005). In addition, rates of maternal depression and harsh parenting practices are particularly high among parents who struggle with multiple stressors, such as those associated with poverty (Kisker and Kuhns 2004). Thus, preventing poor parenting that can lead to unsatisfactory developmental trajectories requires special attention to maternal risk characteristics. With these issues in mind, the onset of prevention programs early in children’s lives and delivery of intervention services via home visitations are two effective strategies for preventing poor parenting in high-risk mothers and children.

Prevention programs are most successful when they occur early in children’s lives, before full-scale problems have emerged (Borkowski et al. 2007). Recent growth modeling studies (e.g., Landry et al. 2001; Steelman et al. 2002) have demonstrated that differing patterns of early parent behavior contributed significantly to later growth trajectories for children. Consequently, a growing emphasis in the field has timed prevention efforts during very early childhood to maximize developmental effects in later childhood and adolescence (Appleyard et al. 2005; Luthar and Cicchetti 2000). Such an approach is consistent with human capital models that attempt to maximize prevention effects by altering key parenting behaviors that can change the slope of child trajectories and yield increasing returns in both human and financial terms over time (e.g., Heckman 2000).

A recommended service delivery strategy for supporting development during infancy and toddlerhood is home visitation (Olds et al. 2007). Previous studies of home visitation programs that occurred prenatally and early in infancy have demonstrated that intervention effects for young, low-income, single mothers occurred immediately, and the effects continued up to 6 years after birth (Izzo et al. 2005; Olds et al. 2004). To prevent the emergence of poor parenting, home visiting may be a particularly useful and sometimes essential method for delivering treatment to high-risk populations. Home visitation can help engage and retain mothers (Olds et al. 2007), particularly those who often lack resources such as transportation and high-quality childcare for other children. Moderate effect sizes for decreasing poor parenting were most likely to occur in early home visiting programs that were brief and targeted (Bakermans-Kranenburg et al. 2003).

Parental Support and Psychological Control

Barber (2002) conceptualized two important constructs or dimensions of caregiver–child interpersonal relationships that have been linked to poor social–emotional outcomes throughout childhood and adolescence. These include low behavioral control (or low parental support) and high psychological control. Behavioral control is characterized by positive support from the parent for a child’s specific behaviors; behavioral support is needed to directly facilitate or manage children’s actions and to produce a reasonable amount of compliance during the socialization process. High (but non-excessive) amounts of behavioral control have been associated with child competence, whereas low amounts of behavioral control have been linked to the emergence and progression of poor regulation and externalizing behaviors (Barber 2002).

Psychological control, however, is aimed at manipulating children’s psychological and emotional functioning and is often characterized by intrusive behavior. A variety of factors may contribute to maternal intrusiveness. For example, parents’ excessive concern or worry may prompt behaviors that interfere with or inhibit children’s independent development (Pomerantz and Eaton 2001). Alternately, inappropriate and unrealistic expectations for child behavior can initiate parental intrusiveness, such as restricting infant engagement with the environment by frequently saying “No!”, removing safe items from babies’ mouths (Kelley et al. 2000), or dominating play activities with over-direction (Rubin et al. 2002). Often, high levels of psychological control become evident when parents endorse rigid and inflexible attitudes about children’s ordinary age-related behaviors. Sometimes, controlling parents use physical punishment or harsh verbal behavior; these actions reflect both high psychological control and inappropriately high behavioral control (Barber 2002). Maternal psychological control has predicted both internalizing and externalizing problems in preschool-aged children. At later ages, maternal psychological control was also associated with consistently deficient academic achievement (Barber 2002).

In contrast to problematic parenting associated with high psychological control, parenting beliefs that reflect a solid understanding of children’s developmental needs are low in psychological control and appropriately high in behavioral control. Constructive parenting preconceptions and attitudes, such as empathy for children’s needs, realistic developmental expectations, and appropriate parent–child role expectations (as compared to parent–child role reversal ideologies) have been shown to predict sensitive and responsive parenting practices leading to improved child outcomes (Kiang et al. 2004). Developmental understanding requires that mothers are aware of which behaviors are suitable for children’s ages and developmental abilities. Once appropriate expectations are established, however, mothers must use their developmental knowledge to consistently provide congruent learning opportunities (Bradley and Corwyn 2005). Developmental understanding then serves as a foundation for providing frequent and rich language that labels objects and actions, encourages children, and scaffolds development (Landry et al. 2006). Another illustration of developmental understanding included engagement in infant activities that demonstrated and rehearsed age-appropriate skills (Bradley and Corwyn 2005).

Conveying desirable emotional expression can also be an area of parenting that is high in positive behavior support and low in psychological control. Optimal emotional expression is characterized by positive feelings and warm responsiveness, an influential parenting behavioral style that promotes early social growth (Steelman et al. 2002). Children who have received maternal warm responsiveness throughout early childhood have shown a significantly more optimal trajectory for later social skills acquisition as compared to children who lacked such treatment (Landry et al. 2001); the direct effect on child social skills was seen as many as 3 years later (Steelman et al. 2002). This effect was found despite the impact of other concurrent and mediating child variables. Additional emotional support comes from feeling generally happy and displaying positive affect towards infants, and behavioral support for children may be lacking when these feelings are absent, such as when mothers experience depression. For instance, the co-occurrence of poor parenting quality and maternal depression has been associated with the presence of internalizing behavior problems in addition to externalizing behavior problems in young children (Jones et al. 2002). Furthermore, low levels of positive emotionality have been shown in children of mothers with a history of depression, even outside of the presence of a current episode or mood disorder (Durbin et al. 2005), illustrating the extended impact of limited positive expression on infant well-being.

In summary, intervention efforts to enhance early maternal parenting in at-risk families need to include service delivery systems such as home visiting that occur very early in the child's life and maximize access to curricula. From a risk reduction standpoint, important intervention aims include decreasing psychological control as transmitted through punitive and intrusive parenting behavior while increasing parental support through a competent understanding of infant developmental needs and positive emotional expression.

The Present Study

We attempted to improve parenting during the first year of children's lives in the following ways that decrease psychological control and increase parental support through appropriate levels of behavioral control: (1) minimizing harsh and intrusive psychologically-controlling behavior, (2) facilitating developmentally-appropriate understanding of infants' needs, and (3) promoting warm nurturing behavior, including congruent, positive emotional expression. To achieve these ends, we tested a packaged intervention with three modules: responsiveness training, developmental knowledge training, and loving touch training.

Responsiveness Training

Recently, Landry et al. (2006) have expanded the concept of maternal responsiveness to include contingent responsiveness, emotional-affective support, support for infant foci of attention, and quality of language input; the Playing and Learning Strategies (PALS) responsiveness curriculum aims to improve these areas of parenting. PALS training unites direct teaching, frequent practice, and video reflection with feedback to

help mothers gain knowledge and skills to interact appropriately with their infants. During PALS, trained facilitators assist mothers with responsiveness using a scripted protocol; a more complete description of PALS can be found in Landry et al. (2006). Regardless of their resource levels, mothers who received this training showed consistent gains over time in positive behaviors (Smith et al. 2005).

Developmental Knowledge Training

Developmental knowledge training aims to teach mothers about appropriate expectations and developmental milestones using relevant literature and interactive discussion. Hess and colleagues (2004) highlighted the relevance of developmental knowledge for parenting, showing that knowledge of infant development interacted with maternal self-efficacy to predict parenting competence; the mothers with low knowledge but high self-efficacy demonstrated the least optimal parenting practices. At-risk mothers have scored lower on readiness-to-parent measures than other mothers (Whitman et al. 2001), which illustrates the significance of increasing developmental knowledge within this group.

Loving Touch Training

Loving touch is an adaptation of infant massage with easy-to-learn techniques designed to increase parents' closeness and affectionate behaviors with their infants. Field (2000) has been instrumental in providing empirical evidence of the benefits of touch for infants; in her studies, infant massage improved both parent–child interactions and child outcomes in high-risk families. Because acceptable touch procedures necessitate knowledge of, and suitable responses to, babies' signals, mothers trained in touch learned how to behave warmly and express positive emotion toward their infants. After just 5 weeks of infant massage, depressed mothers and their infants both showed marked improvement in ratings of mood (Onozawa et al. 2001). The direct teaching and repeated practice in studies of touch training have helped mothers acquire developmentally appropriate techniques to nurture and comfort their infants (Field 2000).

The combined package of training modules, called the “My Baby and Me” intervention, was presented to a randomly assigned sample of at-risk mothers over a period of 12–14 weeks. It was hypothesized that changes in psychological control, developmental understanding, and emotional expression would be sizeable for mothers in the My Baby and Me condition when compared with mothers in a control condition who received only parenting literature and community referrals.

Method

Participants

A sample of 63 mother–infant dyads was enrolled at one of three sites: Houston, Texas; Kansas City, Kansas; or, South Bend, Indiana. Participants were recruited

from local clinics, hospitals, and social service agencies. Criteria for participation were low maternal education (no high school diploma at the time of enrollment) or low family income (WIC or TANF eligible at the time of enrollment). Dyads began the study when infants were between 3.5 and 5.5 months old ($M = 4.3$ months, $SD = 1.1$) and participated for about four and a half months ($M = 4.7$ months, $SD = 1.3$).

The final sample of 48 mothers (attrition rate = 24%) was based upon completion of the entire intervention and the post-assessment. The attrition rate is comparable to those in a review of home visitation intervention programs, where the rate ranged from 20 to 67% of the enrolled sample (Gomby et al. 1999). Other studies have reported similarly high attrition rates within the first year of the program (McGuigan et al. 2003; Olds et al. 2007). Attrition may have been partially due to time conflicts; 47% of dropout participants were enrolled in school and 33% were working, whereas 27% of retained participants were enrolled in school and 27% were working. Dropout participants were not significantly different from remaining participants on substance use, number of children, or target child's place in birth order. Furthermore, dropout participants did not differ from remaining participants on any pre-intervention measures.

Mothers between 15 and 38 years old were stratified by age at the pre-intervention assessment, with participants between 15 and 18 years at baby's birth classified as teens and those between 19 and 38 years classified as adults. Teen mothers ($n = 5$) were on average 16.0 years old ($SD = .7$), and adult mothers ($n = 43$) were on average 23.6 years old ($SD = 5.3$). Biological fathers were, on average, about three and a half years older than mothers; however, mothers were generally not married to fathers (only 25% of mothers were married to anyone at the pre-assessment). Forty percent of mothers were African-American, 33% European-American, 25% Latina, and 2% other (multi-racial). Most (73%) were not working at the time of the pre-intervention assessment; however, mothers reported that over half of biological fathers (58%) were working. Roughly half of fathers (52%) lived with the target infant; an additional 4% of fathers visited the baby. According to mothers' reports, at least some financial support was provided by 69% of fathers.

Design

Treatment and control dyads completed the same pre-intervention assessment battery of self-report and observational measures in their homes; assessments lasted about three and a half hours. About 2 weeks after the pre-intervention assessment, those in the treatment condition began 12–14 sessions of direct intervention; the mean length of total involvement in intervention sessions was 15.3 weeks ($SD = 4.4$). In contrast, the control condition received only enabling supports (i.e., parenting literature and referrals to existing community resources) for 12–14 weeks. Both treatment and control participants subsequently completed a post-intervention assessment battery, also in their homes. All mothers were compensated for their time with a \$30 Walmart gift certificate at the pre-intervention assessment and a \$50 gift certificate at the post-intervention assessment; in the treatment condition, participants received an additional \$40 gift certificate due to the intensive

nature of the intervention. The measures in both assessments explored three different domains of maternal parenting toward the target child: (1) psychological control, (2) developmental understanding, and (3) emotional expression.

Procedure

Mother–infant dyads were randomly assigned to either a minimal intervention control condition ($n = 25$) or a direct intervention treatment condition ($n = 23$) using a matched blocking procedure (Matthews 2000). In this procedure, pairs of participant dyads were first matched on maternal age classification (teen or adult). Next, one member of the pair was randomly assigned to one condition, while the remaining member was assigned to the other condition. In cases where an enrolled dyad did not complete the pre-assessment, the next participant dyad that matched the maternal age classification was used as a replacement. Thus, mothers in this experiment were assigned to control or treatment conditions in very small waves.

Control Condition

Mothers in the minimal intervention control condition received “enabling supports” that included parenting literature and community referrals. The *Take Time for Kids [TTFK]* set contains one booklet for each month of the child’s first year of life. This set of 12 booklets was designed to promote healthy parenting practices and to increase parental knowledge about child development (Texas Department of Health 2000). Interviewers also referred control participants to local assistance programs (such as affordable child care, GED training programs, or treatment facilities) based on wished-for services identified during the pre-intervention and post-intervention assessments. At pre-test and post-test, 83 and 58% of the sample, respectively, requested referrals to community resources; rates of referral were not significantly different between the control and treatment conditions.

Treatment Condition

Mothers in the direct intervention treatment condition received approximately 12 weeks of parent training in addition to the two types of enabling supports (parenting literature and needs-based community referrals) presented to mothers in the control condition. All My Baby and Me training sessions are described in the Appendix. Bachelor’s-level parent facilitators completed a minimum of 30 h of training. Following training, facilitators subsequently videotaped themselves conducting at least two practice sessions on which they met 97% mastery on a set of 32 competencies rated by a doctoral-level master trainer. These trained parent facilitators instructed mothers in PALS responsiveness training for infants (Landry et al. 2002). The PALS curriculum consisted of 10 home visits with mother–infant dyads, including two visits when an alternate child caregiver, chosen by mothers, was invited to participate. In addition to the 10 PALS sessions, mothers in the treatment condition received two supplementary sessions of developmental knowledge training; in these sessions, mothers engaged in dialogue and hands-on

practice regarding principles discussed in two of the *TTFK* booklets (the 6 and 8-month booklets). Loving touch training, an adaptation of infant massage using simple strokes, was also added to two of the existing sessions (sessions 5 and 6) for treatment participants. Training sessions followed completely scripted protocols to ensure consistent treatment administration of the modules across sites and interviewers, and they were conducted in participants' homes. Typical visits lasted about an hour and a half.

Measures of Maternal Characteristics

To determine levels of intellectual functioning, participants completed the *Vocabulary* subtest of the Wechsler abbreviated scale of intelligence (Wechsler 1999). The *Vocabulary* subtest gauged crystallized and general intelligence in addition to other cognitive abilities; previous reliability coefficients have ranged between .90 and .98 for adults and between .86 and .93 for children (Wechsler 1999). Mothers also indicated their levels of psychological distress using the symptom checklist-90-revised (Derogatis 1994). On the self-report checklist, participants indicated the extent to which problems bothered them in the preceding week by rating each item on a 0–4 scale ranging from “Not at all” to “Extremely.” Symptoms of personality disturbance were identified on nine dimensions: *Somatization*, *Obsessive–Compulsive*, *Interpersonal Sensitivity*, *Depression*, *Anxiety*, *Hostility*, *Phobic Anxiety*, *Paranoid Ideation*, and *Psychoticism*. Previous internal reliability coefficients for the nine dimensions have ranged from .77 to .90 (Derogatis 1994).

Measures of Maternal Parenting

Three measures of maternal parenting were collected: the child abuse potential inventory—second edition [CAPI] (Milner 1980), the adult–adolescent parenting inventory—second edition form A [AAPI] (Bavolek and Keene 2001), and the mother–infant observation [MIO] (Landry et al. 1998). On a 25-item short form of the CAPI, consisting of the rigidity and unhappiness subscales, mothers marked “agree” or “disagree” to a series of statements that estimated how much mothers' characteristics resembled those of known physical child abusers (Milner 1990). Higher scores on the *Rigidity* subscale of the CAPI signified strict attitudes towards the appropriateness of children's appearance and behavior, whereas the *Unhappiness* subscale of the CAPI revealed mother's current level of general life dissatisfaction and interpersonal difficulties (Milner 1990). Internal consistency reliability for the short form was .72 (Milner 1990).

Mothers additionally expressed their parental attitudes, expectations, and behaviors toward children on three subscales of the AAPI. Similar to the CAPI, AAPI items were presented on a five-point scale ranging from “strongly agree” to “strongly disagree.” Higher scores on the *Belief in the Value of Corporal Punishment* subscale of the AAPI suggested attitudes that generally endorsed the use of disciplinary tactics that were non-violent and supported spanking alternatives. Higher scores on the *Empathetic Awareness* subscale revealed awareness of

children's age-appropriate demands and prioritization of children's needs, while higher scores on the *Parent–Child Role Reversal* subscale denoted parental responsibility to nurture the needs of children as opposed to expectations of infants as responsible for parental happiness. Cronbach's alpha internal consistency reliabilities ranged from .84 to .92, and construct validity was demonstrated by Cronbach's alpha reliabilities of .80 or above (Bavolek and Keene 2001).

Finally, assessors rated the quality of mothers' parenting behaviors on the MIO, an adaptation for young infants of a naturalistic in-home observational measure originally designed for preschoolers (Landry et al. 1998). Mothers were asked to act the way they normally would at home and were videotaped with their children for 30 min. For each 10 min segment of videotape, mothers' parenting behavior was scored from 1 to 5 for each subscale, with a score of 1 indicating problematic parenting behavior and 5 indicating near-optimal parenting behavior. Scores on each subscale were then averaged across the three rating periods. The *Physical Intrusiveness* subscale noted behaviors such as abrupt repositioning, redirecting, or other disruptive interference with babies, while the *Restrictions* subscale recorded the number of times that mothers verbally or physically limited their infants by using behaviors like saying "no" or removing toys. The *Flexibility and Responsiveness* subscale evaluated psychological control behaviors such as responses to infant initiation, patience, and mother versus child agenda. Developmental understanding was also observed by the MIO. The *Verbal Quality* subscale tallied maternal verbalizations that have been found to scaffold children's development, while the *Demonstrating and Physical Teaching* subscale scored other parenting behaviors that facilitated child learning, such as interactive demonstration or hand-over-hand guidance. Finally, the MIO also measured indications of emotional expression. High ratings on the *Warmth* subscale confirmed positive expressions of emotion such as engagement, encouragement, or acceptance of children. Maternal behaviors such as full-faced smiles or laughs directed at target children on the *Positive Affect* subscale additionally showed desirable emotional expression, while behaviors like indicators of impatience, taunting, or angry tone on the *Negativity* subscale depicted unpleasant emotional expression (Steelman et al. 2002). For every subscale on the MIO, assessors achieved an interrater agreement of at least 80% with a master coder during training. Actual interrater agreements for *Physical Intrusiveness*, *Flexibility and Responsiveness*, *Demonstrating and Physical Teaching*, *Warmth*, *Positive Affect*, and *Negativity* subscales ranged from 88 to 97%.

The subscales from the three measures of maternal parenting were then utilized as indicators of three constructs of parenting shown in Table 1: psychological control, developmental understanding, and emotional expression. Psychological control captured maternal tendency to exert power over infants. Developmental understanding assessed maternal understanding of infants' needs in terms of developmentally appropriate attitudes and actions. Lastly, emotional expression illustrated the extent of positive and negative feelings transmitted from mother to infant. Separate MANCOVAs were used to create linear combinations of the indicators for each construct.

To determine broad levels of maternal functioning, estimated verbal intelligence (measured by vocabulary scores), psychological distress, and substance use were

Table 1 Domains of maternal parenting behaviors and related variables

Psychological control	
<i>Physical intrusiveness</i> subscale	Mother–infant observation
<i>Restrictions</i> subscale	Mother–infant observation
<i>Flexibility and Responsiveness</i> subscale	Mother–infant observation
<i>Rigidity</i> subscale	Child abuse potential inventory
<i>Belief in the value of corporal punishment</i> subscale	Adult–adolescent parenting inventory
Developmental understanding	
<i>Empathetic Awareness</i> subscale	Adult–adolescent parenting inventory
<i>Parent–Child Role Reversal</i> subscale	Adult–adolescent parenting inventory
<i>Verbal Quality</i> subscale	Mother–infant observation
<i>Demonstrating and Physical Teaching</i> subscale	Mother–infant observation
Emotional expression	
<i>Warmth</i> subscale	Mother–infant observation
<i>Positive Affect</i> subscale	Mother–infant observation
<i>Negativity</i> subscale	Mother–infant observation
<i>Unhappiness</i> subscale	Child abuse potential inventory

Table 2 Means and standard deviations for WASI and SCL-90-R subscales

	Treatment condition		Control condition		Total	
	<i>(n = 23)</i>		<i>(n = 25)</i>		<i>(N = 48)</i>	
	M	SD	M	SD	M	SD
Vocabulary	37.65	11.54	34.96	10.03	36.25	10.75
Somatization	.67	.68	.55	.44	.61	.57
Obsessive–compulsive	.82	.79	.71	.66	.76	.72
Interpersonal sensitivity	.49	.45	.47	.50	.48	.48
Depression	.59	.51	.51	.46	.55	.48
Anxiety	.31	.50	.22	.30	.26	.41
Hostility	.36	.40	.64	.77	.50	.63
Phobic anxiety	.26	.48	.14	.28	.20	.39
Paranoid ideation	.65	.69	.75	.68	.70	.68
Psychoticism	.31	.58	.25	.41	.28	.50

explored as shown in Table 2. In terms of vocabulary knowledge, 60% of mothers scored at least one standard deviation below their age-related norm, and none scored a standard deviation or more above the norm (Wechsler 1999). With regard to psychological distress, 52% of mothers obtained scores within typical limits. Several mothers, however, had high scores; 27% obtained scores classified as clinically significant on at least four out of nine dimensions of psychological distress measured (e.g., somatization, obsessive–compulsive, etc.), and 21% obtained scores classified as clinically significant on one to three dimensions. On average, the means

for both conditions fell within normal ranges on all nine dimensions of psychological functioning (Derogatis 1994). Mothers also reported on their substance use. Less than half (44%) had consumed an alcoholic beverage and even fewer (15%) had used drugs in the preceding six months. One-fourth of the sample (25%) reported that they currently smoked cigarettes. There were no significant differences between the treatment and control conditions for estimated verbal intelligence, psychological distress, or substance use; therefore, these variables were not included as covariates for subsequent analyses.

The correlations among pre-intervention and post-intervention scores were examined within each parenting domain, as shown in Table 3. Pre-intervention scores were significantly correlated with the corresponding post-intervention scores, ranging from .38 to .73 for psychological control, .34 to .69 for developmental understanding, and .34 to .68 for emotional expression. The moderate correlations between pre-intervention and post-intervention scores indicate that using pre-intervention scores as covariates is an appropriate strategy for data analysis in testing group differences following the intervention.

Next, a series of MANCOVAs were used to assess post-intervention differences between mothers in the control condition and those in the treatment condition on the three domains of maternal parenting behaviors: (1) psychological control, (2) developmental understanding, and (3) emotional expression. Dependent variables

Table 3 Interrelationships among pre- and post-test indicators of parenting by domain

Pre-test scores	Post-test scores				
Psychological control	1	2	3	4	5
1. Physical intrusiveness	.42**	-.02	.45**	-.29*	.16
2. Restrictions	-.27	.38**	-.02	.40**	-.11
3. Flexibility and responsiveness	.39**	-.08	.73**	-.17	.15
4. Rigidity	-.07	.08	-.21	.73**	-.31*
5. Belief in corporal punishment	.02	-.09	.10	-.12	.66**
Developmental understanding	6	7	8	9	
6. Empathetic awareness	.45**	.43**	.06	.01	
7. Parent–child role reversal	.47**	.69**	.06	-.09	
8. Verbal quality	.26	.38**	.41**	.30*	
9. Demonstration and physical teaching	.12	.14	.30*	.34*	
Emotional expression	10	11	12	13	
10. Warmth	.68**	.47**	.32*	.10	
11. Positive affect	.43**	.58**	.13	-.03	
12. Negativity	.18	.15	.40**	-.18	
13. Unhappiness	.05	-.18	-.20	.34*	

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

included post-intervention assessments of the subscales in each domain found in Table 1. Corresponding pre-intervention scores were included as covariates to reduce error variance. Because participants were randomly assigned to the treatment and control groups, using pre-intervention scores as covariates is the most statistically powerful method of data analysis (Rausch et al. 2003). In addition, random assignment and completion of the pre-test prior to starting the intervention ensures that the treatment and control groups have equal means in the population during the pre-test. Within our sample, there were no differences between conditions on any pre-intervention measure. With two levels of the between-subjects factor and two occasions of measurement, the omnibus test answers both of the following research questions of interest: “Are the treatment and control groups different at post-test controlling for pre-test scores?,” and “Do groups change differently from pre- to post-test?” (Rausch et al. 2003). In sum, significant omnibus effects demonstrate that the groups change differently from pre- to post-test and that the groups differ at the post-intervention measurement.

Missing data for the final sample of 48 participants only occurred on the MIO and was handled in two ways: using averages and mean substitutions. Generally, scores were available for at least one of the three coding periods on the MIO. Thus, for dependent variables where subscale variables were composed of item-level averages, the available items were averaged. This occurred in no more than 6% of cases ($n = 3$) per variable. If no item scores were available, mean substitution was used at the subscale level; subscale substitution was used only for the *Verbal Quality* ($n = 4$) and *Restrictions* subscales ($n = 2$).

Psychological Control

A between-subjects MANCOVA was performed on a linear combination of variables to investigate the impact of the intervention on maternal control. Using Wilks' criterion, results showed that treatment condition was significantly associated with the linear combination, $F(5, 37) = 3.64, p = .009$: mothers in the treatment condition used less controlling behaviors toward their infants than did mothers in the control condition.

Further examination of psychological control entailed running ANCOVAs for each dependent variable in the domain. Table 4 shows the means and standard deviations for each subscale. Because Dunlap and colleagues (1996) have emphasized the importance of correcting for correlated variables (such as those at pre- and post-assessments), Table 4 also presents adjusted confidence intervals along with calculated proportion of variance effect sizes (η^2) (Olejnik and Algina 2000). The interpretations of effect sizes as small, medium, or large were based on guidelines for effect size values (.01, .06, and .14, respectively) suggested by Cohen (1988).

Three effects were found in follow-up ANCOVAs. There was a significant main effect of condition on *Physical Intrusiveness*, $F(1, 41) = 4.08, p = .050$, indicating treatment mothers were evaluated as less invasive and disruptive than were control mothers, with a medium-to-large effect size. There was also a main effect of treatment condition on *Flexibility and Responsiveness*, $F(1, 41) = 6.90, p = .012$.

Table 4 Means and standard deviations for dependent variables, confidence intervals for mean differences, and effect sizes for univariate analyses

Dependent variable	Treatment condition		Control condition		Mean differences		
	(n = 23)		(n = 25)		(Adjusted for covariates)		
	M	SD	M	SD	95% CI		η^2
					Lower	Upper	
Psychological control							
Physical intrusiveness*	3.97	.96	3.33	1.24	.00	1.22	.09
Restrictions	2.85	2.40	2.34	1.64	-.47	1.87	.03
Flexibility/responsiveness*	3.16	1.16	2.62	1.02	.13	1.01	.14
Rigidity**	11.65	12.55	21.80	16.42	-14.53	-3.68	.27
Corporal punishment	5.83	2.08	4.84	1.99	-.36	1.52	.04
Developmental understanding							
Empathetic awareness	5.60	2.25	4.72	2.48	-.22	2.30	.02
Role reversal*	5.60	1.99	4.48	2.31	.27	2.12	.14
Verbal quality*	2.44	1.75	1.65	2.04	.07	2.20	.10
Demonstrating/teaching*	2.65	1.04	2.16	1.03	.18	1.33	.14
Emotional expression							
Warmth	3.44	1.33	2.93	1.20	-.36	.77	.01
Positive affect	3.45	1.29	3.22	1.28	-.56	.69	.00
Negativity	4.36	.90	4.37	.85	-.56	.41	.00
Unhappiness	14.87	11.14	12.96	12.88	-6.10	7.69	.00

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

In this case, treatment mothers were judged as more adaptable and accommodating toward their infants than control mothers, with a large effect size. A main effect of condition on *Rigidity*, $F(1, 41) = 11.49$, $p = .002$, suggested that mothers in the treatment condition were less strict about their children's behavior and appearance than mothers in the control condition. The effect size, accounting for pre-assessment covariates, was quite large, making up almost one quarter of the variance. No main effects were found for *Belief in the Value of Corporal Punishment* or *Restrictions*, although effect sizes for both were in the small-to-medium range, and mean differences were in the expected directions.

Developmental Understanding

Differences between conditions were also found when a between-subjects MANCOVA was performed on the linear combination of variables representing maternal developmental understanding. With the use of Wilks' criterion, treatment condition was significantly associated with the linear combination of dependent variables, $F(4, 39) = 2.89$, $p = .035$; mothers in the treatment condition showed a greater developmentally-appropriate understanding of their infants' needs than did those in the control condition.

Three significant effects emerged from the follow-up ANCOVAs performed on each dependent variable in the developmental understanding domain. First, analyses revealed a significant main effect of condition on *Parent–Child Role Reversal*, $F(1, 42) = 6.73$, $p = .013$, with a large effect size. Mothers in the treatment condition indicated more appropriate understanding of the distinction between parent roles and child roles than did mothers in the control condition. Second, there was a main effect of condition on *Verbal Quality*, $F(1, 42) = 4.60$, $p = .038$, with a medium-to-large effect size, showing that mothers in the treatment condition used verbalizations to scaffold infant language more often than did mothers in the control condition. Third, mothers in the treatment condition used demonstrative actions and physical teaching behaviors more frequently than mothers in the control condition did, indicated by the main effect of condition on *Demonstrating and Physical Teaching*, $F(1, 42) = 7.13$, $p = .011$, with a large effect size. There was no main effect for *Empathetic Awareness*; however, the treatment condition had a medium effect, and mean differences were in the expected direction.

Emotional Expression

To investigate the impact of the intervention on mothers' emotional expression toward their infants, another between-subjects MANCOVA was performed on the linear combination of variables in the emotional expression domain (see Table 1). Using Wilks' criterion, the main effect of condition was not significant on the linear combination of variables. Thus, mothers in the treatment condition did not exhibit more desirable emotional expression toward their infants following the intervention than mothers in the control condition did.

Discussion

The present study was designed to assess the effectiveness of a parenting intervention program for mothers considered to be at risk for poor parenting outcomes. The three basic components of intervention (the “PALS” responsiveness curriculum, the review of developmental booklets, and the provision of basic infant massage instruction) were chosen based on a wealth of previous literature that identified each as reflecting key aspects of early parenting that set the stage for optimal child development. The three components had not previously been combined in a structured intervention program. Our intervention also included the characteristics of programs most likely to be successful based on previous reviews of high-quality parenting interventions (e.g., Bakermans-Kranenberg et al. 2003; Olds et al. 2007): a home-visiting intervention occurring very early that was of relatively short duration but intensive and focused on specific aspects of parent–child interactions. The intervention aimed to facilitate growth in responsive parenting skills and decrease negative parenting attitudes and behaviors as infants progressed through the first year of life. Including an active control group in which mothers were only provided with developmental information and needs-based

referral information allowed us to assess the impact of the active intervention in the treatment condition versus the mere provision of resources in the control condition.

Consistent with our expectations, the My Baby and Me intervention was successful in increasing mothers' use of rich, scaffolding language with their infants, direct teaching and demonstration of skills to their infants, and adoption of responsibility for their appropriate parental role. Mothers who received the intervention also significantly decreased their negative parenting behaviors such as rigidity and intrusiveness. The attainment of medium to large effect sizes in the above domains, despite the small sample size and the intervention's relatively short duration, provides evidence that directly targeting parenting behaviors through video modeling, live practice, and constructive feedback can impact parents' attitudes and their interactions with their infants in meaningful ways. While it could be the case that the beneficial effects resulted from the weekly attention and support received by intervention mothers, and not provided to control mothers, we do not believe this to be the case: Landry et al. (2006) have found significant positive effects for the PALS intervention curriculum even when control group mothers were provided with weekly visits from a facilitator.

An interesting question concerns the lack of significant impact of the intervention on maternal emotional expression. Contrary to expectations, observational ratings of maternal warmth, positive affect, lack of negativity, and self-reported unhappiness were not different for participants in the two study conditions. It is possible that altering emotional expression would require more focused practice of affect modulation than the behavioral changes necessary for decreasing psychological control or fostering developmental understanding. For example, Greenberg (2002) has written extensively about the importance of attending to clients' emotions during psychotherapy sessions as a method for effecting positive change in adaptive functioning. The PALS intervention sessions encouraged mothers to increase awareness of their expressive behaviors toward their babies as part of responding sensitively to infants' signals, but perhaps such changes in expressed affect are less likely to be demonstrated outside of the explicit coaching sessions. Although the loving touch training focused principally on increasing warm and positive behaviors, it did not specifically address using more displays of positive affect and fewer displays of negative affect. Furthermore, no part of the packaged intervention was intended to decrease the general unhappiness of mothers.

These results stand in contrast to Landry and colleagues' (2006) findings, in which PALS intervention mothers displayed significantly higher levels of warm sensitivity, lower levels of negative affect, and greater increases in positive affect than did control group mothers. One likely possibility for the discrepant outcomes between the previous and current outcomes is that the infants in the present study were somewhat younger when they began and ended the program than the infants in the Landry et al. study. Our infants were, on average, only 4.3 months old at the start of the study and 9.0 months old at the time of the post-intervention assessment. The infants in the Landry et al. study averaged 6.2 and 10.7 months, respectively. Thus, during much of the intervention period in the present study, infants had not yet reached the developmental stage where mobility and assertion of autonomy are typically emerging and presenting greater challenges to parents (e.g., Campos et al.

1992). Although the amount of positive affect and warmth varied across mothers in this study, there was very little negativity toward infants seen in either the treatment or control group mothers. This may be one plausible explanation for the apparent lack of significant group differences on these variables. It would be interesting to explicitly test the hypothesis that perhaps there is a lower age limit to this aspect of the intervention as a part of establishing optimal time windows (both lower and upper) for implementation of a packaged curriculum such as *My Baby and Me*.

As in many studies with high-risk participants, missing data presented an interpretive problem. The attrition rate for this sample was comparable to, or better than, that of other family intervention programs aimed at disadvantaged families (e.g., Gomby et al. 1999; McGuigan et al. 2003; Olds et al. 2007). Unfortunately, nearly one quarter of the mothers who completed the pre-test could not be located approximately 4 months later. A likely reason for this rate of attrition is the high degree of instability in the lives of participants in our sample. This issue is amplified for teenage mothers who often experience high levels of both geographical and familial instability (Letourneau et al. 2004). Although only a small proportion of our sample were teenage mothers, adolescents made up over half of the dropout group, and of teenaged dropouts, 67% had lived in their current home for less than a year, compared with only 20% of teenagers who remained in the project. Efforts to maximize our ability to stay connected with participants included obtaining multiple phone numbers and alternate contacts from each participants as well as mailing letters and attempting “drop-in” visits with hard-to-reach families. Nonetheless, facilitators often contended with disconnected phones, full voice-mailboxes, and inability to reach even the alternate contacts, which illustrates the chaotic lives of many of our participants.

A further limitation of this study is the lack of inclusion of fathers in our sample. Fathers were welcomed to participate in sessions, particularly during the two review sessions with an alternate caregiver. Although meta-analyses of early parenting programs have noted that involving both mothers and fathers fostered intervention success (Bakermans-Kranenburg et al. 2003), roughly 44% of fathers in this study did not have any contact with target children (even financially). Mothers, therefore, were chosen as the target participants in the study since mothers often take primary responsibility for the care of infants (e.g., Lee et al. 2003). The training videos used in the intervention sessions all featured mothers. Nonetheless, the skills taught and information provided would be equally relevant for fathers to learn and practice with their infants. Future research may be needed to document the feasibility and impact of such an intervention on fathers. A number of studies have discussed interventions for fathers already engaged in negative parenting practices (e.g., Kelly and Wolfe 2004; Scourfield 2006), and there are some promising new interventions specifically targeting young fathers (Doherty et al. 2006; Parra-Cardona et al. 2006). Obtaining fathers’ consistent attendance at sessions is likely to be a challenging endeavor but one which would add to our knowledge of how to better deliver effective family-based prevention programs.

Despite these limitations, the results of this study demonstrated the willingness of at-risk mothers to embrace new knowledge and skills in order to improve their parenting practices. Exit interviews indicated that, overall, mothers enjoyed the

program and felt that they learned some new parenting skills. It appears that when interventions are designed not only to present developmental information, but also to actively engage parents in practicing new skills with their infants, changes in parent behaviors can be achieved during the critical first year of children's lives. While providing developmental information alone (as we did for the participants in the control condition) may be useful to some motivated parents, it is clearly not sufficient to help many at-risk mothers obtain the right balance of behavioral support and low psychological control with their infants. Instead, pairing knowledge with guided practice seems to be the critical combination in producing measurable changes in parents' skills.

Appendix

Descriptions of My Baby and Me parent training sessions

Session	Description
1. <i>Introduction</i>	Mothers completed semi-structured interviews about families' everyday routines and general beliefs on childrearing including current discipline practices, interpretations of children's behaviors, and goals for infants' futures. Families became acquainted with concepts and procedures, while facilitators gathered information to increase their sensitivity regarding family needs, wishes, and personal objectives beyond those outlined in the curriculum
2. <i>Positive and Negative Signals</i>	Videos revealed a wide range of infant social and distress cues. Discussion and hands-on practice assisted mothers in correctly interpreting their own babies' cues as positive or negative. Mothers were encouraged to acknowledge infant cues as forms of communication about needs rather than indications of babies' acceptance or rejection
3. <i>Linking and Sensitivity Behaviors</i>	Videos, discussion, and practice helped mothers link their responses to correctly recognized infant cues. Emphasis was placed on acting quickly and appropriately when responding to infant signals. Mothers were taught specific skills called sensitivity behaviors (such as positioning, pacing, tone of voice, or affect) to help improve responsiveness to both positive and negative signals
4. <i>Review</i>	Mothers led this review session by teaching an alternate caregiver concepts learned in Sessions 1–3. While mothers explained ideas, parent facilitators evaluated the mothers' grasp of previous topics. If mothers were unable to demonstrate baseline mastery on topics from any previous session, an extra session repeating the earlier topic was inserted into the curriculum before Session 5. Alternate caregivers were included to enlarge mothers' support networks for new parenting practices. The review session also gave mothers the opportunity to execute an "expert" role
<i>Extra</i>	Any material from Sessions 1–3 was reviewed, if required by Session 4
5. <i>Six-month TTFK</i>	Discussion of TTFK booklets centered on age-appropriate parenting behaviors in the areas of eating, sleeping, and safety. Infants' developmental milestones at 6 months were highlighted. Facilitators also introduced loving touch procedures via direct teaching and hands-on practice

Appendix continued

Session	Description
6. <i>Maintaining and Redirecting</i>	Videos demonstrated specific strategies for maintaining infants' interests on a single object or activity. Mothers used hands-on practice to try "maintaining" with their child while facilitators coached. During this time, facilitators discouraged redirecting babies' behaviors to promote child-centered learning. Additionally, mothers' practiced loving touch techniques with guidance
7. <i>Introducing</i>	Videos and discussion clarified favorable times for mothers to introduce infants to a new toy or activity (like face-to-face interactions or games). Mothers were reminded to use sensitivity behaviors (such as tone of voice or hand-over-hand instruction) to maintain babies' attention
8. <i>Words and Actions</i>	Videos, discussion, and guided practice advanced mothers' use of language to introduce activities and maintain babies' attention. The importance of rich language use (such as labeling, describing, and connecting) was underscored. The inclusion of language strengthened mothers' appropriate responses to infants' signals while introducing something new or maintaining attention
9. <i>Eight-month TTFK</i>	Discussion of TTFK booklets developed focused on mothers' recognition of children's changing developmental milestones, especially at 8 months. Facilitators paid particular attention to coping with baby stranger anxiety, reinforcing the value of reading to infants, and generating ideas for developmentally appropriate play
10. <i>Review</i>	The second review echoed objectives presented in Session 4, but mothers revisited Sessions 5–9 rather than Sessions 1–3. Again, an extra session was added before Session 11 if mothers did not meet a baseline mastery level
<i>Extra</i>	Any material from Sessions 5–9 was reviewed, if required by Session 10
11. <i>Generalization</i>	Videos, discussion, and practice stressed tactics for integrating newly acquired parenting behaviors into everyday activities such as feeding, bathing, and dressing. Mothers' were reinforced for identifying several times throughout the typical day to use new parenting skills
12. <i>Final Review</i>	The final review reiterated the entire key parenting skills discussed in Sessions 1–11. Mothers had a final opportunity to demonstrate and practice those skills as well as ask facilitators questions. Videos, discussion, and practice helped mothers consolidate information one more time

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