January 2007

New Mothers' Psychological Experience and Behavioral Interactions with their Infants in the First 12 Months

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J Child Fam Stud (2007) 16:155–167
DOI 10.1007/s10826-006-9075-4

ORIGINAL PAPER

New Mothers' Psychological Experience and Behavioral Interactions with their Infants in the First 12 Months

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Published online: 22 August 2006

Abstract We examined the psychological dimensions of parents' perceptions of their infant children and their own abilities as parents at two observation points in a racially and socio-economically diverse sample of 174 mothers. Parenting perceptions and life circumstances were hypothesized to predict interactive behavior observed in the home. Baseline assessments were conducted in hospital, within 36 hr of delivery. Follow-up assessments were conducted in their homes when the children were 6 to 12 months old. Of five major psychological constructs studied, only parents' perceptions of children, represented particularly by empathic responsiveness and absence of role-reversal, predicted the quality of behavioral interactions in the home. Perceptions of children were themselves predicted by parents' perceptions of the quality of care they themselves received from their own parents, and by lifestyle stress. Our findings suggest that clinical interventions with parents should include a focus on strengthening reflective capacities with respect to caregiving experiences, and empathic responsiveness to their children.

Keywords Parenting · Children · Psychological predictors · Empathy

Perhaps the most influential model of contributors to parenting behavior has been Belsky's (1984) "determinants of parenting," a complex and far-reaching model based on Bronfenbrenner's theory of social ecology. Belsky's model proposed that multiple levels of historical and contemporary social influences, including developmental history, personality variables, a variety of influences in parents' contemporary social networks, and children's own characteristics combine to determine how parents interact with their children. Belsky (1984)

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regarded the parent's maturity, positive coping, and psychological adjustment to be especially important predictors of parenting effectiveness (also see Belsky & Barends, 2002).

One important, though understated, element of Belsky's model was the notion that consistencies in behavior and relationship qualities across social contexts can be accounted for by internalized representations of caregiving relationships. Consistent with Belsky's formulation, predictors of parenting behavior have been identified in parents' representations of early childhood experiences (see Solomon & George, 1996, for a review from an attachment perspective). Some investigators have found linkages between mothers' recollections of early parenting received and the quality of parenting they provide to their own children (Hammond, Landry, Swank, & Smith, 2000; Meyers, 1999).

In contrast, Adler, Hayes, Nolan, Lewin, and Raphael (1991) study of Australian mothers failed to find associations between mothers' retrospective accounts of attachment relationships and mother-infant interaction qualities. Adler et al. pointed out that, consistent with most research in this area, their sample was not a high-risk sample, and suggest that stress and risk factors may be important intervening influences in relationships among these and similarly constructed variables. This finding may simply reflect an additive effect. Recollections of early caregiving experience may be particularly potent influences on contemporary parenting abilities for parents with few resources and high stress, simply because of the relative absence of other sources of nurturance in their lives.

Attitudes about parenting can be thought of as preconceptions of desirable parenting behavior-essentially a generalized model (or several models) of how parents are supposed to behave in fulfilling the duties of childrearing. With notable exceptions, relatively little attention has been paid to the linkages between parenting attitudes and actual parenting behavior (Holden & Buck, 2002). Despite the intuitive appeal of such a link, the influence of attitudes on behavior is not consistently clear. Parenting attitudes generally, however, are believed to be responsible for important contributions to actual behavior, even if this relationship is not an absolute one (Crockenberg & Smith, 1982; Holden & Buck, 2002).

Attitudes toward parenting inevitably include expectations of both parent and child role-defined behavior in the relationship. Attitudes toward and perceptions of the possession and use of power in this relationship is one key variable that influences interactive qualities (Bugental & Happaney, 2002). Parents who expect the parenting role to be constituted by benevolent and authoritative power in relation to children are less likely to maltreat their children, while parents who have a distorted, role-reversed view of power are at high risk for maltreatment (Wolfe, 1999). This relationship is also influenced by mood. Depressed parents are more likely to think their children have hostile intentions toward them and possess greater power than themselves (Foreman & Henshaw, 2002; Wolfe, 1999).

A realistic view of the power differential in adult-child relationships enables parents to better understand their children's needs for them, and to see their children's experience from the children's perspective. Accurate perceptions of their children's needs comprise the fundamental condition associated with parents' capacities for sensitive and responsive caregiving, and these perceptions are the most consistent predictor of secure attachment (Belsky, 1999). Emotional responsiveness is closely tied to accurate perceptions of children's needs of their parents (Belsky & Barends, 2002). Because empathic response in particular is derived from the basic ability to take the perspective of someone else, it is a foundational social skill and plays a key role in differentiating parents who will provide high-quality care from those who will not (Lieberman, Silverman, & Pawl, 2000; Wolfe, 1999).

The self-perceptions parents have as parents are closely related in the psychological realm to attitudes. Where attitudes are a generalized model of how parents should behave,

self-perceptions reflect a personal model of how one sees one's abilities as a parent. One of the consistent findings in the literature on self-perceptions in parenting is that the more capable a parent feels in fulfilling parental roles, the greater the likelihood of that parent's practicing positive parenting behavior (Fish & Stifler, 1993); this, in turn, predicts positive child psychosocial and academic competence (Sigel & McGillicuddy-DeLisi, 2002). The self-fulfilling nature of the relationship between self-perceptions and parenting behavior was brought sharply into focus particularly with Bandura's (1997) self-efficacy theory. Self-perceptions of one's abilities as a parent are influenced by a variety of factors from the parent's own developmental history, experience as a parent, psychological adjustment, and other personality characteristics (Belsky & Barends, 2002; Fish & Stifler, 1993; Grusec & Mammone, 1995).

Parents' psychological symptoms, another important psychological dimension, have also been shown to influence interactive behavior between parents and infants (Jones et al., 1997; Mayes et al., 1997; Shuler, Black & Starr, 1995). Maternal depression, in particular, has clearly been implicated as a risk for poor mother-infant interactions (Beck, 1995) and developmental delays in infants over the first year (Jones et al., 1997).

While the majority of this research has focused on the effects of maternal depression on interactions, the other emotional dimensions subsumed under the rubric of "neuroticism," principally anxiety and hostility, have also been implicated as contributors to poor parenting quality (Belsky & Barends, 2002; Fish & Stifler, 1993). Zeanah, Keener, Anders, and Vieira-Baker (1987) found evidence that maternal anxiety may be a critical factor in the nature of the psychological context into which infants are born, and ultimately the nature of mother-child interactive behavior. The internalizing (e.g., depression and anxiety) and externalizing (e.g., hostility and violence) dimensions of psychological problems in parents have proven to be robust predictors of long-term developmental problems in young children (see Seifer & Dickstein, 2000; Kaufman & Henrich, 2000, respectively).

Despite the need to identify and better understand the discreet psychological processes involved in determining parenting behavior, it remains necessary to locate psychological processes within the larger social ecology of parenting. Psychological processes do not occur in isolation. As Belsky (1984) originally posited, an important contributor to the quality of care parents provide to offspring is likely to be the quality of relational transactions they experience in the wider social environment, including access to a variety of instrumental and material resources. Any model of contributors to parenting behavior thus must include the influence of contemporaneous social resources. The accumulation, in particular, of risk factors associated with life in impoverished social environments, including poor family functioning, numerous stressful life events, maternal psychological distress, and low income, has been shown to present greater risks to children's development than individual indicators of parental distress (Sameroff & Fiese, 2000).

This study extends prior research on psychological predictors of parenting behavior by studying a racially and socio-economically mixed sample of mothers and their infant children at delivery and several months later. We hypothesized that representations of relationships with one's family of origin (measured through reports of care during childhood and current relationships with mother, father, and siblings) working through lifestyle stress and vulnerability would have direct effects on maternal self-perceptions, psychological problems, and parenting attitudes and empathy, and that these three constructs would then directly influence mother-infant interaction as observed at follow-up.

Methods

Sample and population

The current analyses are based on data from the Volunteer Infant Parent Study (VIPS), a longitudinal study of mothers and their infants who were interviewed in the hospital at delivery and again in their homes 6 to 12 months later (Combs-Orme, Cain, & Wilson, 2004). A total of 246 new mothers were recruited between February 1, 1999, and November 2, 1999, from the Mother-Baby Unit of a university-affiliated hospital in a mid-size southeastern city. Discharge occurred within 24 hr for most vaginal and 48 hr for most Cesarean section deliveries, so most interviews were conducted 12 to 36 hr after delivery. Results of this study are based on 174 participants who completed follow-up assessments.

Probability sampling was not possible because the hospital was unwilling to provide an enumeration of patients, and resources would not permit an interviewer to be on the unit at all times. Interviewers were present on the unit 20 to 30 hr per week (including weekends) for most of the data collection period, and they simply approached mothers who were available for private interviews. The few refusals were related to early discharge, mothers' being sleepy or in pain, or the presence of visitors.

We did not target high-risk mothers, although we approached African-Americans first and interviewed only African-American mothers in the last few weeks of the study in order to obtain a sample large enough for conducting analyses within race. Comparisons to the hospital birth population indicate that the procedure was effective in increasing the proportion of African-American mothers (42%) as compared to the delivering population during this time (22%). Sixty-four percent of the sample was 24 years or younger; 58% had high school degree equivalent or less; 66% had annual incomes under $20,000; 41% were first-time mothers. Eighty-eight infants (50%) were male and 85 (49%) were female (gender is missing for one baby).

Procedures

Recruitment and baseline interviews

We approached mothers who did not have visitors in their rooms to request participation unless they appeared too ill, psychotic, or intellectually limited to give Informed Consent. We did not include the small number of mothers whose babies had died or were not expected to survive or those relinquishing custody.

To reduce the expense of follow-up, the sample was restricted to residents of counties within approximately 30 min drive, though mothers who moved out of the county after recruitment were retained. Interviewers explained the nature and purpose of the study, including plans for follow-up interviews in respondents' homes, the incentive (a $10 gift certificate), and the requirement for private interviews. The recruitment interview included the Adult Adolescent Parenting Inventory (AAPI-2; Bavolek & Keene, 1999), the Maternal Concerns Scale (MCS; Combs-Orme, Cain, & Wilson, 2004; Combs-Orme, Martin, Fox, & Faver, 2000), and the Parental Bonding Instrument (PBI; Parker, Tupling, & Brown, 1979). The interview required approximately 20 min, including the Informed Consent process.

Follow-up interviews

Interviews were completed in respondents' homes when infants were 6 to 12 months old. We chose this time to capture the early months of infancy, a stressful developmental stage for

many parents (Schmitt, 1987). (Testing indicated that there were no significant correlations between the dependent variables and infant age at followup [data not shown]).The follow-up interview was ninety minutes to two hours in length and included the Family Resource Scale (FRS; Dunst & Leet, 1985, 1987) the Life Events Inventory (LEI; Egeland, Breitenbucher & Rosenberg, 1980), the infant-toddler HOME Inventory (IT-HOME; Bradley, Mundfrom, Whiteside, Casey, & Barrett, 1994), and the Young Adult Self-Report (YASR; Achenbach, 1997).

Mothers reported their infants' medical conditions at followup, including 23 (14%) whose health care providers had indicated that the infants were small for age. The most frequently reported health problems included asthma (13 infants), reflux (5 infants), ear problems such as infections (7 infants), eye problems, including one cataract (4 infants), and eczema (5 infants). One mother reported that her infant had been diagnosed with neurofibromatosis; two indicated that their infants had sleep apnea; and two reported heart murmurs.

Constructs and instruments

Representational models of experiences with caregivers in family of origin

Mothers' experiences with their families of origin were measured using the Parental Bonding Instrument (PBI; Parker, Tupling, & Brown, 1979) and part of the Adaptive Coping subscale of the Young Adult Self Report (YASR; Achenbach, 1997). The PBI is a 25-item scale that measures adults' perceptions of relationships with their parents growing up. Responses are summed to create two subscales: (1) Care, as contrasted with indifference and rejection (12 items), and (2) Overprotection, as contrasted with allowance of autonomy (13 items). Higher subscale scores indicate greater care (a positive attribute) or overprotection (a negative attribute), respectively.

Estimates of internal consistency and test-retest reliability of the PBI, obtained in numerous studies with different populations, typically range from .80 to .90 for both the Care and Overprotection subscales. The internal consistency of the PBI for our sample was .93 for Care and .78 for Overprotection. Considerable evidence also provides support for numerous aspects of convergent validity across a wide variety of populations.

The adaptive functioning subscale of the YASR (described below) contains 16 items that measure adaptive functioning in social relationships, at work and at home. For the current study we used a three-item summative scale of respondents' self-reported current relationships with their mothers, fathers, and siblings. Although coefficient alpha for this 3-item scale was low (.48), it was significantly correlated in the expected direction with the PBI Care scale (.30, $p < .01$) and with PBI Overprotection ($-.23$, $p < .01$), as well as with the YASR measures of internalizing ($-.20$, $p < .01$) and externalizing ($-.20$, $p < .01$) behavior problems. Moreover, the factor loadings of the two PBI subscales and the YASR Current Relationships subscale on our Family of Origin construct are strong ($\lambda = .65$, .48, .52, respectively). Thus, the low reliability may be due to the small number of items, and we retained the scale in the current analyses.

Lifestyle stress and vulnerability

This construct includes both stressful life events and problems with various kinds of resources. We measured stressful life events at the follow-up interview with the 39-item Life Events Inventory (LEI; Egeland, Breitenbucher, & Rosenberg, 1980), a measure constructed specifically for populations of low-income mothers. Mothers report the occurrence in the

previous six months of events such as significant loss of income, being arrested, being the victim of a crime, etc. Although internal consistency data have not been published for this scale, coefficient alpha for our sample was .76.

The second variable in the Lifestyle Stress and Vulnerability construct was measured using the Family Resource Scale (FRS), a 30-item scale that measures the adequacy of a family's physical, personal and interpersonal resources when caring for young children (Dunst & Leet, 1985, 1987). The resources measured by the FRS include adequacy of food, shelter, transportation, time to be with family and friends, time for self, health care, money to pay bills, child care, and resources for children.

The reliability of the FRS was established in a study of 45 mothers of preschool-age children with developmental disabilities (Dunst & Leet, 1987). Estimates for internal consistency ranged from .92 to .97. Split-half reliability was .97. Test-retest reliability for the total scale scores was .52. The validity of the FRS was demonstrated in significant associations with mothers' personal well-being and commitment to carrying out professionally prescribed interventions for children (Dunst & Leet, 1987). Coefficient alpha for the current sample was .80. Factor loadings of these two measures on our Lifestyle Stress and Vulnerability construct were .55 and .64 (λ), respectively.

Maternal self-perceptions

Mothers' perceptions of themselves as parents were measured using four of the subscales of the Maternal Concerns Scale, a new measure created by the second author and colleagues (MCS; Combs-Orme et al., 2000, 2004). The 21-item MCS measures mothers' concerns (yes/no) about providing adequate care for their infants and, if a concern is indicated, the degree of concern on a 10-point scale. Four subscales measure concerns about general competence, child care, abuse and neglect, and meeting basic needs. Higher scores indicate more concerns about parenting. Factor loadings of these four subscales on our Maternal Self-Perceptions construct were each approximately .60 (λ).

Our research shows that mothers expressing concern about their parenting abilities at delivery are at elevated risk for child abuse (Combs-Orme et al., 2000), and report significantly higher levels of parenting stress in the first few months of their infants' lives (Combs-Orme et al., 2004).

Psychological problems

Psychological problems were measured using the Young Adult Self-Report (YASR; Achenbach, 1997). In addition to the adaptive functioning items described above, the YASR has 116 problem items. Eight problem syndromes (e.g., anxious/depressed, aggressive behavior) are constructed by summing appropriate items, which are combined into Internalizing and Externalizing subscales. Both the Internalizing and Externalizing problems subscales have shown good test-retest reliability (.88 and .86, respectively). Achenbach (1997) reports support for the criterion-related validity of the YASR with analyses showing significant differences between subjects referred and nonreferred for mental health services. Construct validity was evidenced by significant correlations between the YASR and other theoretically meaningful measures of mental health.

The YASR is normed for mothers ages 18 to 30, but we administered the measure to all the mothers, including 17 (10%) who were under the age of 18 and 37 (21%) who were over the age of 30 at followup. We are unable to locate information on the reliability and validity

of the YASR for mothers who are outside the 18–30 age range. Nevertheless, the overall reliability of the YASR was acceptable (Internalizing .91; Externalizing .82), and so, in the interests of using the same measure with all mothers, we used the YASR.

The issue of long-term stability of the YASR is important, because we administered the YASR only at followup to represent respondents' psychological problems throughout the time period of the study. Stability of the YASR was assessed in 484 respondents over a mean interval of 39 months; Achenbach (1997) reported Pearson *r*s of .62 for internalizing and .63 for externalizing problems. Ferdinand, Van Der Reijden, Verhulst, Nienhuis, and Giel (1995) also demonstrated excellent stability over 8 months for internalizing (.79) and externalizing (.77) problems. These findings support the use of the YASR at followup to reflect mothers' psychological problems over the first few months of their infants' lives. The factor loadings for Internalizing and Externalizing on our construct of Psychological Problems were .86 and .79 (λ), respectively.

Perceptual dimensions of parenting: Attitudes and empathic responsiveness

We measured perceptual dimensions of parenting at delivery using the widely used 40-item Adult Adolescent Parenting Inventory (AAPI-2; Bavolek & Keene, 1999). Five summated subscale scores measure: (1) appropriateness of developmental expectations; (2) empathy for children's needs; (3) endorsement of alternatives to corporal punishment; (4) appropriateness of views of parent-child roles; and (5) attitudes that encourage child independence as opposed to controlling and power-assertive attitudes. Results from Bavolek and Keene (1999) strongly support the factor structure of the AAPI-2, based on factor analyses from a diverse population of 1,427. Known-groups comparisons also demonstrated that the five constructs of the AAPI-2 significantly discriminated between abusive and non-abusive parents. Coefficient alphas for the subscales with diverse samples of clients from 53 social service agencies in 23 states have been reported by Bavolek and Keene (1999) as: (1) developmental expectations (.89); (2) empathy (.93); (3) corporal punishment (.96); (4) role reversal (.92); and power-independence (.86). Internal consistency reliability of the subscales in the present sample were: developmenal expectations (.58), empathy (.70), corporal punishment (.74), role reversal (.74), and power-independence (.44). Among the factor loadings for these sub-scales on our construct of Parenting Attitudes/Empathy, the Empathy subscale ($\lambda = .90$) is by far the strongest, while Corporal Punishment ($\lambda = .32$) is the least important.

Maternal infant interaction

Mother-infant interaction was measured using the infant-toddler version of the 45-item HOME Inventory (IT-HOME; Bradley, Mundfrom, Whiteside, Casey, & Barrett, 1994), which was completed by interviewers after spending at least ninety minutes with mothers. We used three subscales measuring mothers' sensitivity to their infants' cues and needs; acceptance of their infants' behavior; and involvement with their infants.

Caldwell and Bradley (1984) have reported moderate to high internal consistency in a normative group of 172 families, with alphas of .89 for the total HOME score and .44 to .77 for the subscales. Internal consistency was somewhat mixed in our data: .70 for Responsivity, .52 for Acceptance, and .78 for Involvement. Over 25 years of research has demonstrated moderate, but important, correlations between HOME scores and later cognitive and language development and social competence (Bradley, 1994). More important to the current study, Bradley (1994) showed consistency in the few studies available between

HOME scores and indicators of child maltreatment. The factor loadings on our construct Mother-Infant Interaction indicate Acceptance ($\lambda = .38$) is less prominent than Responsivity and Involvement ($\lambda = .68, .75$, respectively).

Statistical analysis

Structural equation modeling (SEM) using LISREL was used to examine the influences on mother-infant interaction for cases with complete data ($n = 174$). SEM involves the construction of a hypothesized model based on theory or previous research, followed by testing and estimation of the model (Kline, 1998). Construction of the model first involves specification of how factors (typically referred to as "latent variables") such as "family of origin" are measured by observed variables (e.g., perceptions of affectionate care).

Results

Observed variables for each latent variable are listed in Table 1, along with means, standard deviations, and ranges.

Figure 1 shows the model hypothesized in the present study with results. The ellipses represent the latent variables. One-way arrows indicate direct influences of one variable on another. Bivariate correlations between maternal race and the independent and dependent variables in the model were few and inconsistent in strength and direction (data not shown). Given this inconsistency, the number of correlations examined, and our focus on psychological processes in this study, we therefore did not include race in the statistical model.

In the interest of simplicity, our model shows only the interrelationships among the latent variables. (Each observed variable is constrained to load only on the latent variable that it is

Table 1 Means, standard deviations, and ranges for measured variables

Construct	Variable	Mean (*SD*)	Potential range
Representations of family of origin	PBI care	29.3 (7.9)	0–36
	PBI over	16.1 (7.4)	0–38
	YASR fam. (adaptv. funct.)	.76 (1.4)	(–3) – (+3)
Lifestyle stress & vulnerability	FRS total	115.1 (13.9)	73–143
	LEI total (stressful events)	3.3 (2.9)	0–14.6
Maternal self-perceptions	General competence	5.3 (6.4)	0–28
	Abuse	1.5 (3.2)	0–25
	Child care	6.6 (8.4)	0–30
	Basic needs	3.5 (7.2)	0–40
Psych. problems	Internalizing	11.2 (7.2)	0–28
	Externalizing	7.5 (5.7)	0–29
Parenting attitudes/empathy	Developmental expectations	20.4 (3.2)	11–29
	Empathy	37.1 (4.4)	22–50
	Corporal punishment	35.4 (5.5)	22–52
	Role reversal	23.6 (4.4)	13–34
	Power vs. independence	19.1 (2.4)	13–25
Mother-infant interaction	Responsivity	8.9 (1.9)	1–11
	Acceptance	6.1 (1.4)	0–8
	Involvement	4.6 (1.8)	0–6

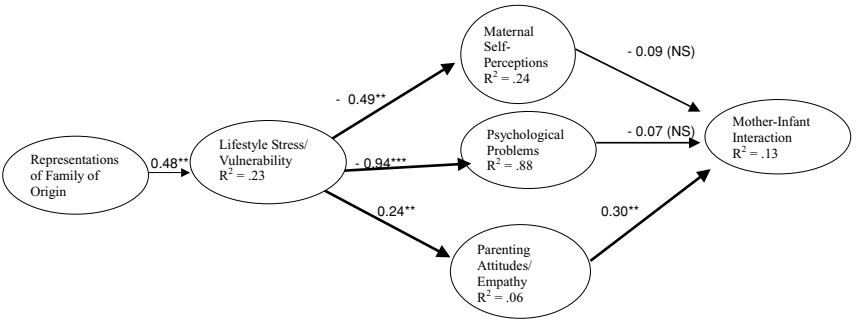

Fig. 1 SEM model and results

hypothesized to represent; loadings on other latent variables are constrained to equal zero.) The latent variables were assigned scale scores by setting the raw factor loadings of reference indicators (the first indicator variable shown in Table 1) to a value of one. Consequently, a unit change in a latent variable is equivalent to a unit change in the corresponding reference indicator. We use the completely standardized coefficients to facilitate interpretation and comparisons among the constructs. The Comparative Fit Index (CFI) for this model is 0.94 (the CFI may range from 0 to 1, with values closer to 1 representing a good fit). A Root Mean Square of Approximation of .05 indicates a good model fit; the RMSEA for this model was 0.044 (90% CI = .025, .059).

As Figure 1 shows, our hypotheses were largely supported. More positive relationships with and reports of good care by family are significantly and positively related to lifestyle stress and vulnerability. Representations of family of origin accounts for 23% of the variance in the lifestyle stress/vulnerability construct.

Furthermore, the lifestyle stress/vulnerability construct is significantly related to each of the three psychological variables; less adequate resources and more stressful life events are related to greater concerns about providing adequate care (maternal self-perceptions), more psychological problems, and more negative parenting attitudes.

Family of origin also has indirect effects (estimated by LISREL) on all three of the intermediate variables, working through lifestyle stress and vulnerability (data not shown in the figure). Most notable is a large indirect effect (−.54) of representations of family of origin through lifestyle stress/vulnerability on psychological problems. A total of 88% of the variance in psychological problems is accounted for by the combination of representations of family of origin and lifestyle stress/vulnerability. Representations of family of origin also indirectly affects maternal self-perceptions through lifestyle (Beta = −.22), and the total variance accounted for in maternal self-perceptions is .24. Finally, there is a smaller but significant indirect effect (Beta = .09) on parenting attitudes/empathy (total variance = .06).

Finally, Figure 1 shows that after accounting for the effects described above, only parenting attitudes and empathy have a significant direct effect (Beta = .30) on mother-infant interaction. The total amount of variance in mother-infant interaction accounted for by this model is .13, a nontrivial effect categorized as “medium” by Cohen (1988).

Discussion

Our study of a racially and socio-economically diverse sample of mothers in the first 12 months of their children’s lives adds to our understanding of the role of specific

psychological processes involved in parenting, including the influence of developmental history, stress and coping, self-concept, psychological problems, and parenting attitudes and other perceptions. Mothers' reports of good care received in their families of origin were directly, positively, and significantly related to adequacy of physical, personal and interpersonal resources, and to fewer stressful life events. It may be that this finding reflects coping capacities. In other words, positively recollected childhood caregiving (apart from the actual reality of the quality of early caregiving, which was not measured) may be a force that sustains caregivers in the face of adversity. It also may be that people with primarily positive recollections of early caregiving are better able to negotiate various life circumstances and achieve less stressful lifestyles.

It is our belief that life stress as a research construct should never be considered only as a "context." Such an approach fails to recognize how individuals participate in the creation of their own social contexts (see Scarr, 1996). As Belsky (1984) originally demonstrated in his model of the determinants of parenting, the forces of the social ecology that influence the quality of parenting, from the historical to psychological and social levels, are bi-directional in nature, including the interactive effects of personality and social variables. The bi-directionality of influences may even operate to the extent that experienced stress may affect the way adults organize and recollect their early caregiving experiences.

Internalized representations of early caregiving were indirectly associated with psychological problems, parenting attitudes, and self-perceptions of parenting through the impact of stressful life events and inadequate resources in the family. Most notable is the large indirect effect of mothers' recollections of early caregiving through lifestyle (life stress) on psychological problems. A total of 88% of the variance in internalizing and externalizing psychological problems is accounted for by the combination of family of origin and lifestyle. We were surprised that our data could not confirm a direct link between psychological vulnerability and parenting, as many other studies have. This may be accounted for by the fact that our analyses, unlike many other studies, took into consideration the effects of several related psychological constructs simultaneously.

Although these findings are in need of replication, they imply that the oft-reported linkage between parents' psychological symptoms and problematic relational interactions with children may be influenced by other important psychological processes that are not commonly measured in the same context. The linkages we did find among early caregiving, lifestyle vulnerability, and psychological problems suggest that the effects of lifestyle vulnerability are pervasive and take a significant toll on a parent's capacity to effectively cope and function.

Of all the psychological predictors that we examined, only parenting attitudes and empathic responsiveness had a significant, direct effect on mother-infant interaction. Parenting attitudes, represented particularly by empathy for children's needs and absence of role-reversal, positively and directly affected mother-infant interaction, most notably responsivity and involvement. It appears that parents who are more capable of empathic responding to their children, those we assume with strong "perspective-taking" skills, are more likely to have more positive and mutually satisfying behavioral interactions with their children. This capacity, in turn, is significantly affected by parents' own developmental histories as well as contemporaneous stress and lifestyle vulnerabilities. This suggests that the accumulation of stress related to impoverished resources in the lives of parents is likely to interfere with parents' emotional availability to their children.

We believe that these findings are particularly significant for their implications for intervention. Most psychotherapy involves some form of stress reduction, support, and effective problem-solving. Our findings suggest that interventions such as these are precisely what

may strengthen parents' abilities to engage in effective parenting, because they promise to enhance opportunities for parents to be more emotionally available to their children. Furthermore, interventions that include reflection on the developmental legacy of early parenting received (specifically, how memories of the quality of care received from parents are organized), are also more likely to play significant roles in strengthening parent-child relationships. It is possible that this sort of reflective therapy may provide opportunities to strengthen coping through a reevaluation of early caregiving relationships. Although our data cannot show the nature of the effects precisely, it may be that the toll taken by negative recollections of early caregiving experiences on a parent's adjustment manifests itself as the experience of victimization and unresolved emotional pain. Resolutions of such experiences can happen through therapeutic intervention.

Finally, interventions that specifically address parents' capacities for empathic responding are likely to also target essential parenting skills (see, e.g., McDonough, 2000; Marvin, Cooper, Hoffman, & Powell, 2002). We believe that the evidence we present here, together with the small but accumulating body of research showing the efficacy of interventions focused on empathic understanding, points to the importance of empathic understanding as a central element of preventive and intervention efforts with high risk families.

As we noted earlier, the sample used in this study was not a probability sample. The sample is similar to the mothers one is likely to find in publicly funded facilities, but with a clear skew toward disadvantaged mothers. On the other hand, a significant advantage of this study is that the sample is a non-clinical sample allowing for more comparison to a general or normative population sample.

Another limitation of the study is found in the timing of measurement observations. Our model is presented in such a way as to suggest path effects among recollections of early caregiving, lifestyle stress, and certain psychological dimensions of parenting on parent-infant interaction. We created this model on the basis of the conceptual linkages among these variables. Due to the limitations of the data collection circumstances involving new mothers in hospital, the number of measures we were able to collect at time 1 was very limited. Thus, despite our conceptual arrangement of the constructs, part of our measure of recollections of early caregiving, our lifestyle vulnerability/stress variable, and our measure of psychological problems were measured at time 2 (in addition to the dependent measure of parent-infant interaction). We argue that the stability and robustness of our variables allow us to include them in the model we present, but clearly these findings are in need of replication.

Acknowledgments This work was funded by grants from the National Institute of Mental Health, NIH R24 MH53623, "Children's Mental Health Services Research Center," the Mruz Family Foundation, the Society for the Psychological Study of Social Problems, and the Office of Research and College of Social Work, University of Tennessee. The authors especially thank John G. Orme for his assistance.

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