

A Cognitive Approach to Child Abuse Prevention

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This investigation tested the incremental utility of cognitive retraining as a component within a program designed to prevent child maltreatment. High-risk families ($N = 96$) were randomly assigned to a control condition, home visitation modeled after the Healthy Start program (unenanced home visitation), or home visitation that included a cognitive component (enhanced home visitation). Mothers were identified late during pregnancy or soon after birth, and their participation continued for 1 year. Lower levels of harsh parenting were found among mothers in the enhanced home visitation condition than among those in the unenhanced home visitation or control conditions. Prevalence of physical abuse (percentage of mothers who were abusive) during the first year was 26% in the control condition, 23% in the unenhanced home visitation condition, and 4% in the enhanced home visitation condition. Benefits were greatest in families that included a medically at-risk child. A linear pattern of benefits was found for child health; as program features were added, benefits for child health increased.

In recent years, the issue of child maltreatment has received increasing attention in both the scientific and public domains. Much of the attention it has received follows from its continuing pervasiveness and severity. Thousands of infants and children come to the attention of medical professionals every year as a result of the injuries or other types of harm they have experienced at the hands of their parents.

Within the United States, approximately 3 million suspected cases of child maltreatment are reported in a year's time. On the basis of cases officially reported by child protective service agencies (and thus a clear underestimate), over 1,000 children die annually as a result of abuse or neglect (National Center on Child Abuse and Neglect data system, U.S. Department of Health and Human Service's Administration for Children and Families, Children's Bureau, 1995¹).

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Physical abuse of the young is not only a severe public health problem and a source of national shame, it is also a perplexity. Abusers often describe their children as engaging in aversive behaviors intentionally and perceive themselves as victims (Bugental, Blue, & Cruzcosa, 1989; Larrance & Twentyman, 1983). Within this interpretive bias lies an important key to prevention efforts. In the program described here, efforts were made to test the effectiveness of a cognitively based home visitation program directed toward preventing child maltreatment among at-risk parents.

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Child Maltreatment Understood From a Social-Cognitive Perspective

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Researchers concerned with family conflict have regularly observed that parents' hostile affect and behavior often follow from the biased ways in which they interpret caregiving events (Dix & Lochman, 1990; Dix, Ruble, & Zambarano, 1989). That is, more negative parental responses are

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¹ Data were obtained from the following address: acs.dhhs.gov/programs/cb/publications/cm99/high.htm (April 2001).

shown by parents who think of their children as behaving with intentional malice. Consistent with this general process, parents who hold hostile or blame-oriented beliefs about children are also more likely to maltreat their children. In particular, this pattern has been observed with physically abusive parents (e.g., Azar, 1988; Azar & Twentyman, 1986; Larrance & Twentyman, 1983; Miller & Azar, 1996). Abusive parents even attribute negative intentionality to infants (e.g., Azar, 1988; Larrance & Twentyman, 1983).

Early consideration of parental cognitions focused on explicit, reflective, aware appraisal processes. Researchers have increasingly noted that caregiver cognitions also involve implicit processes that lie outside of awareness (as summarized in Bugental & Johnston, 2000). Parents often respond to their children's actions without reflective appraisal, and they may be thought of as accessing relevant cognitions automatically. In doing so, they are drawing on relationship schemas that have their origins in the personal history of the individual parent—in particular, their own attachment history. Grusec and Mammone (1995) demonstrated that mothers who had an insecure attachment style (as measured by the Adult Attachment Interview) also tended to have biased cognitions about the nature of their own relationships with the young. That is, they were more likely to interpret their relationships with children in a power-focused way. Power-focused parents, in turn, were found to be more likely to maltreat their children (Grusec, Adam, & Mammone, 1993).

We have been specifically concerned with parental power schemas as a risk factor for family conflict and child maltreatment (e.g., Bugental et al., 1989). Bugental et al. (1989) observed that physically abusive parents are more likely than other parents to see themselves as lacking power in the caregiving relationship. That is, they see the child as having high power and themselves as lacking power (Bugental et al., 1989). In addition, perceived powerlessness (prior to the birth of a child) predicts subsequent maltreatment during infancy (Bugental, 2001). This cognitive bias is highly accessible and comes to mind automatically (Bugental, Lyon, Cortez, & Krantz, 1997). It also serves to influence the physiological reactivity that has often been observed among abusive parents in response to caregiving stimuli (Frodi & Lamb, 1980; Wolfe, Fairbank, Kelly, & Bradlyn, 1983). More specifically, cognitively at-risk mothers show the highest level of physiological reactivity to ambiguous but potentially difficult interactions with the young (e.g., Bugental et al., 1993; Bugental, Lewis, Lin, Lyon, & Kopeikin, 2000). This is consistent with the more general finding that biased cognitions are more clearly revealed in response to aversive but ambiguous events (Nix et al., 1999). When confronted with events that provide few direct cues as to their meaning, there is a general tendency to fall back on such schemas to provide a default interpretation (Wong & Weiner, 1981). Thus, when parents are confronted with the ambiguous demands of a newborn child, they are particularly likely to rely on their cognitive representations of caregiving relationships.

Efforts to Reduce Child Maltreatment

At the present time, efforts to prevent child maltreatment (e.g., as reflected in the activities of the Healthy Families America initiative) are largely empirically based (as described in Daro, 1998). Within this approach, the findings and suggestive leads from past programs are pooled to provide a basis for the design of composite prevention programs (Daro, 1998). The specific theoretical basis of prevention programs has moved into a secondary role as attention has turned to general theories of parent-child interaction and child development (along with theories of child maltreatment) as the basis for program development. As pointed out by Reppucci, Woolard, and Fried (1999) in their review of this literature, few prevention programs have a solid theoretical basis.

Although the use of prevention efforts that combine the features of successful programs is appealing at an applied level, there are associated limitations. Most importantly, it is difficult to determine which of the many included features accounts for the benefits found. As another constraint, combined programs limit the possibility of determining whether there are systematic differences in the success of different program features for different populations (e.g., different cultural groups). In addition, the use of such programs limits our full understanding of the processes that lead to reduction in problems (e.g., reduced maltreatment) versus the processes that foster positive outcomes. Well-designed and evaluated prevention programs, like all good experimentation, allow the possibility of adding to our basic knowledge of specific causal processes as well as providing a summative evaluation of the overall effectiveness of programs. In addition, our broader understanding is enhanced by the use of experimental designs that provide a test of evidence for competing theoretical models.

Proposed Prevention Program

Design of the Program

In the prevention program described in this article, an effort was made to assess the selective advantages of focusing on parents' cognitions about the caregiving relationship. That is, the program directed specific attention to parents' causal analysis of caregiving challenges and subsequent problem-solving activity. If biased caregiver cognitions lead to increased risk of physical abuse, adaptive alterations in the cognitive appraisal process would be expected to lead to reductions in physically abusive or harsh parenting practices. In addition, if parents who hold biased cognitions are more reactive to "difficult" children, the benefits of redirection of cognitive appraisal processes should be greatest when the newborn infant poses a more challenging stimulus to caregivers.

The cognitive appraisal program tested in this study makes use of features that are often incorporated within composite prevention programs but that have not been tested for their specific effectiveness as a means of preventing abuse (as pointed out by Stern & Azar, 1998). For

example, Olds (1997) includes self-efficacy training as one of the features of his prevention program. Cognitively based family interventions have been relatively successful (e.g., Kolko, 1996), and researchers have suggested that they can be expected to be useful as a prevention tool (e.g., Azar, 1997).

As a specific test of the incremental utility of a cognitive appraisal component within a prevention program, we compared the effectiveness of a composite home visitation program (the Healthy Start Program) with and without the inclusion of a cognitive appraisal component. The effectiveness of both programs was, in turn, compared with the effectiveness of simple provision of referral information to parents regarding available help within the community (a control condition).

The cognitive appraisal component was designed to enhance parents' perceptions of power or competence within the relationship. As noted in reviews of this literature (e.g., Daro, 1998), public systems of care often foster family dependency rather than empowerment or independence. At the same time, perceived parental powerlessness has been described as a key feature in parental risk for maltreatment (Guterman, 1997). Therefore, the program implemented here was a specific effort to assist parents in becoming competent and independent problem solvers, a skill that is underdeveloped among abusive parents (e.g., Azar, Robinson, Hekimian, & Twentyman, 1984; Hanson, Pallotta, Tishelman, Conaway, & MacMillan, 1989) and that may be expected to endure following participation in the program. The cognitive appraisal program makes use of a two-part procedure that includes assisted shifts in primary appraisal processes (causal appraisal of reasons for a caregiving difficulty) and secondary appraisal processes (problem-focused coping). Although the model is not drawn directly from Lazarus and Folkman's coping model (e.g., Lazarus & Folkman, 1984), it is consistent with it. The use of a two-part strategy is also consistent with the work of Azar and her colleagues on cognitive strategies in the treatment of abusive parents (e.g., Stern & Azar, 1998). Within this program, we made use of a two-part intervention. At the first step, at-risk parents are assisted in acquiring skills in reading children's cues to distress and in countering misattributional processes (e.g., countering the view that infants or very young children can read parents' minds, are behaving with negative intent, or are challenging parental power). At the second step, at-risk parents are provided with problem-solving training in which they define the problem, brainstorm possible solutions, evaluate possible consequences, develop an action plan, and observe and evaluate the success of their efforts.

Consistent with efforts that have been most successful in the past (e.g., Olds & Kitzman, 1993; Ramey & Ramey, 1998), we identified an at-risk population of mothers during pregnancy or soon after the birth of a child. Family risk was defined in terms of parent history and circumstances (e.g., unemployment, past history of own abuse, lack of support) and was determined with the risk measures used in the Healthy Start model. Families were randomly assigned to one of the two home visitation conditions or to the control

condition. The success of the program was assessed in terms of (a) reduction in harsh parenting (including specific instances of physical abuse) and (b) increases in child health.

Specific Predictions

We predicted that parents who participated in home visitation that included a cognitive appraisal component (enhanced home visitation) would show lower levels of harsh parenting and physical abuse than would parents who participated in the Healthy Start program (unenhanced home visitation) or who did not receive home visitation (control condition).

Benefits for prevention of harsh parenting following from participation in the cognitive appraisal prevention program were predicted to be greatest in families that included an at-risk child (as reflected in preterm status or relatively low Apgar scores). In short, child risk was expected to moderate the effects of prevention condition. Finally, mediating processes were assessed. Possible mediators included changes in parents' cognitions (most consistent with the enhanced home visitation condition), changes in parents' perceived social support (consistent with either the enhanced or the unenhanced home visitation condition), and changes in parents' affect (consistent with either the enhanced or the unenhanced home visitation condition).

The effects of condition on child health (a positive outcome that is a major goal of the Healthy Families America program) were assessed on an exploratory basis. Possible outcomes of the program are testable within three different models. According to one model, distinctive advantages can be expected for participation in the cognitive appraisal prevention program (Model 1). As a competing model, advantages can be found for participation in either home visitation condition (Model 2). As a second competing model, benefits may be linear, that is, families participating in the cognitive appraisal condition show benefits that are greater than those shown by families who participate in the unenhanced home visitation condition; families who participate in the home visitation condition, in turn, show greater benefits than do families in the control condition (Model 3).

Method

Research Participants

Sample Characteristics

In selecting our target population, we identified families that were at moderate risk for maltreatment. This decision was based on evidence that programmatic benefits may be more probable in these families in comparison with very high-risk families. That is, child abuse prevention services have been found to be higher among families with less serious problems than among those with more serious problems (Barth, 1991); researchers have suggested that typical child abuse prevention programs lack the capacity to provide appropriate services for very high-risk families. As paraprofessionals were used in this study, we believed that this limitation would be present within the current program. One hundred and seven families were identified as at moderate risk for abuse on the basis of their responses to the Family Stress Checklist (FSC;

Murphy, Orkow, & Nikola, 1985). Of these families, 96 agreed to participate in the program.

All families expecting the birth of a child (or having recently given birth to a child) who were identified as at moderate risk to become abusive were eligible to participate in the program. With few exceptions (3%), families were Latino (many of whom were recent immigrants). Approximately half of the children born to families in the targeted community are Latino. Families that did not include a husband or partner constituted 48% of the sample. Among the mothers in the sample, 50% had themselves been physically abused as children (as assessed in an interview inquiring about childhood history, with abuse defined as parental use of punitive tactics that carry a high risk for child injury). The average education of mothers was 7.8 years ($SD = 3.1$), and the average age of mothers was 25.5 years ($SD = 6.1$).

Families were identified for potential inclusion at local health clinics and offices of pediatricians and obstetricians. In identifying at-risk families, we employed instruments currently in use within Santa Barbara County for this purpose. Hospital staff used a locally developed Preliminary Screening Questionnaire (PSQ) instrument to identify at-risk families at the time of birth. The PSQ includes such risk factors as parental unemployment, low income, unstable housing, and low education, risk factors that are consistent with screening methods used within the Healthy Start program (Breakey & Pratt, 1991; Mitchel-Bond & Cohn-Donnelly, 1993).

For the current study, families indicating risk on two or more items on the PSQ were invited to undergo assessment with the FSC (as described in Murphy et al., 1985), a semistructured interview. The FSC provides a summary indication of risk based on parental responses to 10 risk factors: parents' own abuse history, past history of involvement with child protective services, current crises, history of partner violence, history of substance abuse or mental illness, history of criminality, parents' belief in harsh punishment, parental perception of the child as difficult, unrealistic child expectations, and parental ambivalence about the child. Problem areas are coded for risk level (0 = no risk, 5 = low risk, and 10 = high risk) and then summed to provide a total score. The measure has high sensitivity (80%), high specificity (89%), and high predictive power. A score of 0–20 has been found to predict low levels of future abuse; a score of 25–40 has been found to predict moderate levels of future abuse; and scores above 40 have been found to predict high levels of future abuse. All families scoring at moderate risk for future abuse were offered the program.

Program Completion

The program was completed (including post-program measures) by 73 of the 96 participating families (76%). Completion rates were equivalent across the three program conditions. That is, 80% of families in the enhanced home visitation condition, 77% of families in the unenhanced home visitation condition, and 70% of families in the control condition completed the program. The differences in completion rates across conditions did not approach significance, $\chi^2(2, N = 73) = 1.02$. No significant differences were found in the characteristics of parents and children among those who completed versus those who did not complete the program.

Whenever possible, fathers were involved in the program. However, only 30 fathers completed the program. Because of this sampling constraint, all findings reported here focus on mothers.

Identification of Child Risk

Child risk was identified on the basis of hospital birth records of the infant's 5-min Apgar scores (<9) and premature status (3

weeks or more). Although the levels selected are in the normal range in terms of medical risk, they are predictive of differences in children's response patterns (e.g., Field, 1981, 1983a, 1983b; Lewis, Bartels, & Campbell, 1967; Lester, Emory, & Hoffman, 1976; Pickens, Field, Nawrocki, & Martinez, 1994; Turkewitz, Moreau, & Birch, 1968), and thus the responses they may elicit from caregivers. Children with either risk factor were included in the high-risk group, and children with neither risk factor were included in the low-risk group.

Prevention Conditions

Participants within the program were assigned in a randomized order to condition. No initial differences were found in the characteristics of children or parents among families assigned to the three conditions (as shown in Table 1). Parents in all conditions were seen by one of six home visitors (paraprofessionals). All home visitors received weekly supervision by a licensed clinical social worker. Parents in the home visitation conditions were seen over the course of one year. The program was designed to provide 20 visits to each family in both the enhanced and unenhanced home visitation conditions. In comparing the actual number of visits made within these conditions, no significant differences were found ($t < 1$). The mean number of visits was 17; deviations from the goal of 20 visits resulted from cancellations due to family illness, work commitments, and/or trips to visit relatives.

The content of the three conditions was incremental in nature. That is, parents in the control condition received no direct services but were provided information regarding existing services available in the community. Parents in the unenhanced home visitation condition received home visitation consistent with the Healthy Start program, supplemented with information regarding existing services available in the community. Families in the enhanced home visitation condition received information about existing community services, combined with methods used in the Healthy Start program and a brief attributionally based problem-solving discussion at the start of each visit (causal appraisal followed by problem-focused appraisal).

Unenhanced Home Visitation Condition

Services provided within the unenhanced home visitation condition utilized methods first developed within the Hawaii Healthy Start program (Breakey & Pratt, 1991; Mitchel-Bond & Cohn-Donnelly, 1993). This program focused on parent education, establishment and use of social support networks, and anger management. All home visitors were trained in home visitation methods through participation in the national Parents as Teachers Program.² The Parents as Teachers Program training focuses on helping parents learn to support their own children's healthy development; in four key areas: (a) language, intellect, and motor development; (b) social-emotional issues; (c) safety and health issues; and (d) finding ways to build social support networks and establish contact with community agencies. Staff were trained at the Parents as Teachers Center in National City, California. One of the two Parents as Teachers trainers was Caucasian and the other trainer was Latino.

The unenhanced home visitation condition was designed to promote the well-being of children by providing services to at-risk

² Training was provided by the National City Unified School District (1500 North Avenue, National City, California 91950) host for the Parents as Teachers Program.

Table 1
Characteristics of Families in the Three Conditions

Variable	Enhanced home visitation condition		Unenhanced home visitation condition		Control condition	
	<i>M</i>	(<i>SD</i>)	<i>M</i>	(<i>SD</i>)	<i>M</i>	(<i>SD</i>)
Child age at intake (months) ^a	-1.91	(2.02)	-1.82	(2.81)	-2.56	(2.29)
Mother's age	26.49	(7.03)	25.02	(5.78)	23.74	(4.81)
Number of siblings	1.26	(1.42)	1.30	(1.13)	0.89	(1.22)
Maternal education (years)	8.00	(2.76)	7.97	(3.50)	7.50	(3.18)
FSC total score	34.14	(11.73)	32.41	(10.36)	31.11	(7.38)
Infant Apgar score	8.91	(0.64)	9.03	(0.74)	8.77	(0.71)
Preterm (no. weeks)	1.21	(1.70)	0.79	(1.34)	0.64	(1.55)
Father present		50%		61%		44%
Boys (vs. girls)		59%		53%		52%

Note. The families did not differ significantly on any of the demographic variables, as determined with simple analyses of variance or chi-square tests. Sample sizes ranged from 32 to 35 in the enhanced condition, from 31 to 34 in the unenhanced condition, and from 25 to 27 in the control condition. FSC = Family Stress Checklist; scores can range from 0 to 100. Apgar scores can range from 1 to 10.

^a Child age has a minus value when intake occurred prior to the child's birth.

parents and parents-to-be in Santa Barbara County. Assisted by a grant from the California Department of Social Services, the program provided regular home visits to assist with the following: setting and reaching family goals, obtaining quality health care and other services, obtaining skills for successful parenting, managing money matters, and obtaining other services to reduce the stresses of parenting and to promote family well-being.

Enhanced Home Visitation Condition

The enhanced home visitation condition combines all the features of the unenhanced condition with an additional cognitive appraisal component (described in the introduction). The cognitive appraisal component represents an additional feature that is incorporated at the start of home visits. Parents are assisted in making a causal appraisal of the possible reasons for an identified caregiving problem and in designing a strategic plan for the future. The success of that strategy is then assessed at the next visit. The goal of the program is to give parents repeated experience in finding new ways (directed away from self- or child-blame) of explaining problems and in finding new ways of resolving those problems.

At the start of each visit, parents in the current program were asked for examples of recent caregiving problems. They were then asked about (a) the potential causes of those problems (with repeated inquiry until a benign or non-blame-oriented cause was generated by the parent) and (b) potential ways of solving problems (to be tried out during the next period and discussed at the following visit). Differences from Azar's cognitively based approach (Stern & Azar, 1998) focused on style of discourse. That is, the home visitors within our program served as facilitators of alternative thoughts in causal appraisal processes. For example, parents were encouraged to continue a causal appraisal until a benign cause was generated; home visitors did not, however, point out or interpret misattribitional problems. This difference is consistent with target populations within treatment versus prevention programs. That is, a direct focus on misattribitional processes is consistent with efforts to stop parental abuse, whereas the generation of constructive attributions is consistent with efforts to prevent the initial occurrence of parental abuse.

For example, a mother might list an inconsolable infant as a problem. When asked about the reason for this problem, she might

initially say she was a "bad mother" or that the child "was mad at her." She would then be asked for additional reasons for the child's crying behavior, with questioning continuing until a reason was offered that did not suggest blame (e.g., problems with the formula being used with the infant). Subsequently, the mother would be asked her ideas as to how the problem might be reduced or how she might obtain more information about ways to solve the problem. Questioning and discussion would continue until the mothers generated some strategy to try (e.g., singing to the child, giving the child a massage).

On the following visit, parents were asked about the success of their problem-solving efforts. The success of the strategy used was discussed and refined or altered for the next visit. In addition, a question was asked about new problems (and the same sequence was followed).

Child Outcome Measures

Outcome measures were of two types: (a) those intended to measure harsh parenting, and (b) those intended to measure child health. All parents were told at the intake visit that home visitors were mandated by law to report instances of abuse (parents provided informed consent both for the collection of measures and for participation in the program).

Harsh Parenting

Harsh parenting was assessed on the basis of responses to the Conflict Tactics Scale (CTS; Straus, 1979). The CTS asks for frequency of occurrence of different ways of responding to family conflict. Reliability coefficients of the CTS are .62 for the use of violent tactics and .77 for verbal aggression for parent-child conflicts (Straus & Gelles, 1990).

The CTS was translated (and back-translated) into Spanish by native speakers. The CTS was administered either through self-report questionnaires or through the use of an audiotaped questionnaire (with answer sheets that used ascending circles instead of numbers to indicate ratings).

CTS items were divided into those that have been defined as

physically abusive³ (e.g., hitting with a fist or object, beating up, kicking, biting) or those that involve legally nonabusive use of force (spanking or slapping; pushing, grabbing, or shoving; throwing something at the child). As parents who made any use of nonabusive force included spanking or slapping as their most commonly used tactic, we refer to nonabusive use of force as "spanking/slapping." Parents provided answers on a frequency scale ranging from no use of a particular tactic in the past year to use of the tactic on more than 20 occasions. Abuse was operationalized both in terms of frequency of abuse and presence or absence of any abuse (i.e., a child was identified as physically abused if he or she had at any time been the recipient of any kind of abusive parental tactic). In addition, (and following a conversation with Murray Straus), shaking was added as an abusive category. Infant shaking creates exceptionally high risk for infant death as well as nonfatal brain damage, including associated loss of vision and seizures (e.g., Bruce & Zimmerman, 1989; Cox, 1996). We also added a second item (throwing or tossing the child down) as having implications similar to infant shaking. As noted by Peterson and Brown (1994), throwing a baby with force—even onto a soft surface—may cause the child's brain to contact the skull with a force of up to 300 times the force of gravity (with resultant risk for severe brain damage).

A combined score of "harsh parenting" was also created on the basis of the frequency levels with which physically coercive parental tactics were used or threatened. An alpha coefficient was computed on parental harshness for this particular sample. A coefficient of .72 was obtained.

In support of our use of the CTS, a self-report measure, we obtained correlations between parental responses to the CTS and their responses to the Social Desirability Scale of the Toddler Behavior Assessment Questionnaire (Goldsmith, Buss, & Lemery, 1997) within a subset of families measured ($n = 28$). The correlation between frequency rates of any type of harsh parenting practice (logarithmic transformations) and scores on the Social Desirability Scale was $-.17$. The correlation between frequency rates of physical abuse (logarithmic transformations) and scores on the Social Desirability Scale was $-.13$. The correlation between frequency rates of spanking/slapping (logarithmic transformations) and scores on the Social Desirability Scale was $-.11$. Because of the nature of the sample (primarily undocumented immigrants who moved frequently and made use of different names on different occasions), it was not possible to obtain meaningful information on officially reported abuse for the families studied. However, the low relationships found between reported abuse and social desirability scores support our argument that parents either did not know that some of their practices were harmful (e.g., infant shaking) or believed that their practices were acceptable (e.g., spanking).

The CTS was administered as a post-program measure. As all intake measures were taken prior to the birth of the child, it was not possible to assess responses to the CTS as a pre-program measure.

Child Health

For this study, child health was defined on the basis of freedom from health problems during the first year of life. A health interview was conducted with parents as a post-program measure. The interview included items of several different types: (a) frequency of child injuries, (b) frequency of child illness, and (c) frequency of child feeding problems. Child injuries were significantly correlated with child feeding problems ($r = .28, p < .01, n = 72$) but not with child illness ($r = .07$). Child illness was significantly correlated with child feeding problems ($r = .34, p < .01, n = 72$). Child injuries and child feeding problems were significantly cor-

related with harsh parenting ($r = .34, p < .01; r = .29, p < .01$); no equivalent relationship was found between child illness and harsh parenting ($r = .17, ns$). Alpha coefficients on the three subscales were .37 (injury), .48 (feeding problems), and .56 (illness). A combined health scale score was created in which subscale scores were converted to z scores and summed. Items on this composite measure yielded an alpha coefficient of .53. However, good interjudge agreement ($r = .76$) was found on the combined health report measure, as completed separately for mothers and fathers (for the 30 families that included two parents).

The health interview was developed in collaboration with staff of a local hospital's emergency room (on the basis of injuries and illnesses seen during infancy). Presence of high levels of injury (e.g., falls, cuts, bruises), illness (e.g., respiratory illnesses), or feeding problems (e.g., reports of nipple refusal) were interpreted as reflecting health problems. Child health was defined in terms of low frequency of health problems. At the same time, it must be recognized that poor health indicators may also be markers of maltreatment. For example, feeding problems may be markers of neglect, and injuries may reflect a hidden marker of abuse or neglect (Peterson & Brown, 1994).

Relationship Between Outcome Measures

The relationship between the two child outcome measures used here was low. However, it was statistically significant ($r = .32, p < .01, n = 72$).

Potential Mediating Processes

A series of measures were included that could be predicted to serve as mediators of observed reductions in child maltreatment. All measures were administered by home visitors. Pre-program measures were administered at the point of intake. Post-program measures were taken when children reached their first birthday. All instruments were translated (and back-translated) into Spanish by local, native speakers. Audiotaped versions of instruments were available for use with those families who were illiterate. Home visitors provided explanatory information when needed. Measures were selected to provide evidence of the extent to which positive outcomes reflected: (a) altered cognitions about the relationship between parent and child, (b) affective changes, and (c) increases in social support.

Cognitive Representations of Parent-Child Relationships

Parent Attribution Test (PAT). The PAT (Bugental et al., 1989) was introduced as a measure of parental attributions. The PAT is a self-report instrument that measures respondents' beliefs about control or power within their relationships. The format of the instrument is nontransparent and not subject to self-presentation biases (Bugental, Johnston, New, & Silvester, 1998). Subscales

³ Any instances of physical abuse were reported to Child Welfare Services (CWS). In extreme cases, participation in the program was terminated. If progress was being made within the program, no action was taken by CWS. If families in the control condition revealed a history of caregiving problems at the 1-year follow-up, they were referred to appropriate community agencies for family services. Families in the enhanced and unenhanced home visitation conditions who continued to manifest problems at the 1-year follow-up were also referred for continuing help.

originally emerging in a multidimensional scaling analysis (Bugental et al., 1989) were subsequently tested in a confirmatory factor analysis. The best fitting solution revealed a four-factor solution (in which ACF represents adult control factor and CCF represents child control factor) that included: (a) causes controllable by self, for example, effort (ACF-high), (b) causes involving self but not controllable by self, for example, illness (ACF-low), (c) causes controllable by the child, for example, stubbornness (CCF-high), and (d) causes involving the child but not controllable by the child, for example, fatigue (CCF-low). Each factor included three items. Intake measures yielded alpha coefficients of .57 (ACF-high), .43 (ACF-low), .67 (CCF-high), and .66 (CCF-low). Follow-up measures yielded alpha coefficients of .71 (ACF-high), .58 (ACF-low), .57 (CCF-high), and .59 (CCF-low).

In most of our past research, composite scores have been created for ACF (ACF-low items reverse scored and combined with ACF-high items) and CCF (CCF-low items reverse scored and combined with CCF-high items). Perceived control over failure is created by subtracting CCF from ACF. Modest stability (test-retest) coefficients have been found for this measure ($r = .63$). Construct validity for the instrument has been established by demonstrating a reliable relationship between PAT scores and negative reactivity, for example, increases in sympathetic activation (Bugental et al., 1993, 2000), increases in cortisol production (Lin, Bugental, Turek, Martorell, & Olster, 2002), increases in use of force (Bugental et al., 2000), increases in negative affect (Bugental, Blue, & Lewis, 1990; Bugental et al., 1993), and increases in display of false positive affect (Bugental, Brown, & Reiss, 1996). Those adults with low ACF scores and high CCF scores have been found to show specific reactivity to "difficult" children or "difficult" caregiving settings. In addition, PAT scores have been found to serve as significant predictors of physical child abuse (e.g., Bradley & Peters, 1991; Bugental et al., 1989). In the present study (with PAT scores acting as potential process measures), we used the four-factor scores. Because nothing is known about the extent to which responses to the PAT are subject to change in response to an attributional manipulation, we measured change scores separately for all of the factors.

Graphic depiction of perceived power. Finally, parents' drawings of self and child were assessed as potential indicators of perceived power relationships. Children's drawings of their families have been found to provide useful markers of their attachment relationships (e.g., Kaplan & Main, 1985). Kaplan and Main suggested the possibility that "role reversals" in size depictions (among other signs) of family members were associated with distinctive attachment patterns. Fury, Carlson, and Sroufe (1997) developed this system further to include other aspects of children's family drawings. For example, vulnerability (e.g., size distortions) was found to be associated with a resistant attachment history. In general, size of the person drawn has been found to provide an indication of their emotional importance (Van Krevelen, 1975).

In this study, we shifted attention to parents' depictions of themselves and their infant children. Drawings were made on separate sheets of paper. We anticipated that those parents who see children as a threat would draw children's heads (distance from outer edge of left side of head to outer edge of right side of head, measured in centimeters) as larger than would parents who did not share this perception. As there have been no past attempts to measure the significance of parental size depiction of self and child (to our knowledge), no information is available on the psychometric properties of this measure. However, good reliability has been found in the use of equivalent measures for children's drawings; for example, a test of the reliability of the vulnerability score yielded an r of .93 (Fury, et al., 1997). In the present study, modest

support was found for the stability of mothers' depicted size of own head ($r = .49$, comparing drawings made prior to their child's birth with drawings made when their child reached 1 year of age).

Affect

State-Trait Anxiety Inventory (STAI). The STAI (Spielberger, Gorsuch, & Lushene, 1970) is a 40-item scale intended to measure both state anxiety (how the respondent feels at the present time) and trait anxiety (how the respondent typically feels). The STAI was developed to be appropriate to a general community population and is considered to be the best developed psychometric instrument for the measurement of anxiety in the general population (Levitt, 1967). The median reliability of the STAI-T (Trait measure) is .77 for a college population and .70 for a high school population. The median reliability of the STAI-S (State measure) is .33. Coefficient alphas computed for this sample were .75 for the STAI-T (taken at intake) and .87 for the STAI-S (taken at follow-up).

Beck Depression Inventory (BDI). The BDI (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) is a well researched instrument that provides a 21-item assessment of depressive symptoms. Coefficient alphas assessing internal consistency range from .73 to .92. Correlations between the BDI and clinical ratings of depression range from .55 to .73 (Beck, Steer, & Garbin, 1988). Coefficient alphas computed for this sample were .86 for initial measures and .88 for follow-up measures.

Social Support: Social Provisions Scale (SPS)

The SPS (Cutrona & Russell, 1987) is a 24-item measure of satisfaction with existing sources of social support. The scale assesses perceived support in six areas: Guidance, Reliable Alliance, Reassurance of Worth, Opportunity for Nurture, Attachment Feelings, and Social Integration. Subscale scores have been found to be significantly related to other measures of interpersonal relationships. Coefficient alphas on subscales range from .65 to .76. The SPS also includes an Overall Support scale, with a reliability of .91.

In the present study, analyses were limited to the Reliable Alliance scale and Guidance scale. These scales are most concerned with the quality of social support. On the Reliable Alliance scale, respondents made ratings on a 4-point scale ranging from *strongly disagree* (1) to *strongly agree* (4) on such items as, "there are people I can count on in an emergency." On the Guidance scale, respondents made ratings on such items as, "There is someone I could talk to about important decisions in my life." Coefficient alphas computed on Reliable Alliance for this sample were .44 on initial measures and .58 on follow-up measures. Coefficient alphas on Guidance were .65 on initial measures and .67 on follow-up measures.

Differences in Measures as a Function of Program Completion

We conducted an analysis to determine whether there were any differences on initial measures between those mothers who completed the program versus those who did not. The only significant differences between those mothers who completed the program and those who did not occurred with the social support variables. Mothers completing the program had higher Reliable Alliance scores ($M = 12.53$) and Guidance scores ($M = 12.58$) than did mothers who did not complete the program ($M_s = 11.30$ and 10.61 , $p < .05$).

Table 2
Initial Differences in Measures Across Conditions

Measure	Enhanced home visitation condition		Unenhanced home visitation condition		Control condition		Significance of difference
	<i>M</i>	(<i>SD</i>)	<i>M</i>	(<i>SD</i>)	<i>M</i>	(<i>SD</i>)	
PAT							
ACF-high	5.65	(1.39)	5.33	(1.39)	5.83	(1.16)	<i>ns</i>
ACF-low	5.64	(1.39)	4.78	(1.67)	5.98	(0.94)	$p < .01$
CCF-high	5.14	(1.33)	5.18	(1.39)	5.51	(1.35)	<i>ns</i>
CCF-low	5.48	(1.55)	5.44	(1.50)	5.96	(1.07)	<i>ns</i>
Depicted size of child	2.26	(1.77)	2.17	(1.19)	2.51	(2.14)	<i>ns</i>
Depicted size of self	3.00	(2.70)	3.68	(2.46)	3.55	(3.07)	<i>ns</i>
STAI-T	41.00	(8.70)	41.38	(7.61)	42.00	(7.91)	<i>ns</i>
BDI	12.46	(9.61)	8.50	(5.77)	11.42	(9.51)	<i>ns</i>
SPS, Reliable Alliance	12.37	(1.66)	12.06	(2.19)	12.30	(2.69)	<i>ns</i>
SPS, Guidance	12.11	(2.03)	12.41	(2.50)	11.70	(3.02)	<i>ns</i>

Note. Significance of differences was determined using simple analyses of variance. PAT = Parent Attribution Test; ACF = adult control factor; CCF = child control factor; STAI-T = State-Trait Anxiety Inventory—Trait measure; BDI = Beck Depression Inventory; SPS = Social Provisions Scale. PAT scores represent average “importance” ratings on 7-point scales, where 7 is high. “Size” measures are presented in centimeters. STAI-T, BDI, and SPS scores represent total scores on these scales.

Intercorrelation Between Measures

We conducted a second analysis to determine the relationship between variables as post-program measures. Correlations across measures (with p values less than .01) included BDI scores and mother’s depiction of child head size ($r = .58$); BDI scores and Reliable Alliance scores on the SPS ($r = -.32$); and BDI scores and STAI-S scores ($r = .43$). In addition, there was a significant relationship between the two SPS scales ($r = .61$) and mothers’ depictions of own head size and child’s head size ($r = .58$).

Initial Differences in Measures Across Conditions

An analysis was conducted to determine whether any initial differences were present on process variables, that is, cognitive, affective, and social support measures (despite random assignment to condition). Means are shown in Table 2. Only one score (ACF-low mean for mothers in the unenhanced home visitation condition) differed significantly from the others; this deviation is best considered a chance occurrence.

Results

Integrity of Program Implementation

Integrity of program implementation was approached by two strategies. The first strategy involved the exact specification and monitoring of prevention procedures (as suggested by Ammerman, 1998). Qualitative case notes were made after every visit, and notes were discussed with clinical supervisors at weekly meetings.⁴ Tallies completed by clinical supervisors revealed that the cognitive appraisal manipulation occurred in 72% of the visits in the enhanced home visitation condition. Analyses were conducted to assess the relationship between (a) the percentage of visits (within individual families) in which the cognitive appraisal manipulation was introduced and (b) child outcome mea-

ures. Although no significant relationship was found between frequency of implementation and harsh parenting ($r = .06$, *ns*), a strong relationship was found between frequency of implementation and child health ($r = .56$, $p < .01$).

Other indications of program integrity are provided by changes on measures consistent with program goals. For example, a test of the cognitive changes that occurred in response to the enhanced home visitation condition was provided by responses to instruments concerned with social power in the family (described later).

Harsh Parenting

Frequency of Harsh Parenting

We conducted an ANOVA to assess the levels of harsh parenting found for families participating in the three conditions. The analysis included one grouping variable (condition). Harsh parenting was defined by the frequency of use of either physically abusive tactics or spanking/slapping. Because of the skewed distribution of harsh parenting, we conducted a logarithmic transformation on these scores.

The main effect of condition was significant, $F(2, 70) = 3.20$, $p = .05$. Means were .06 for the enhanced home visitation, .23 for the unenhanced home visitation, and .25 for the control condition.

⁴ In the view of those supervisors, direct observations (or audiotaped records) of visits (to assess fidelity of implementation) would provide an excess source of distress to families (who often were undocumented immigrants to the United States). As a result, evidence for fidelity of program implementation was limited to indirect information. No information is available on exact timing or content of problem-solving discussions.

As described earlier, the observed effects may reflect one of three different patterns: (Model 1) harsh parenting may be lower in the enhanced home visitation than in either the unenhanced visitation or control conditions (reflecting unique benefits following from a cognitive appraisal intervention); (Model 2) harsh parenting may be lower in either home visitation condition than in the control condition; or (Model 3) harsh parenting may reflect a linear, incremental pattern in which benefits (reductions in harsh parenting) increase as program features are added (that is, enhanced > unenhanced > control). We conducted planned contrasts in order to determine the best fit with findings. Weights were assigned that directly test the potential relationships that might be found. For example, the appropriate test of linear effects (enhanced > unenhanced > control) is reflected in weights of 1, 0, and -1. Planned contrast analysis requires that the assigned weights sum to zero.

To test support for Model 1 (enhanced > unenhanced or control), we assigned a weight of 2 to the enhanced condition, and weights of -1 were assigned to both the unenhanced and control conditions. To test support for Model 2 (enhanced or unenhanced > control), we assigned a weight of 1 to both the enhanced and unenhanced conditions, and a weight of -2 to the control condition. To test support for Model 3 (enhanced > unenhanced > control), we assigned a weight of 1 to the enhanced condition, 0 to the unenhanced condition, and -1 to the control condition. Consistent with predictions, significant support was found only for Model 1, $t(70) = 2.34, p = .01$. Therefore, all further analyses of the potential moderators and mediators of harsh parenting were limited to a comparison of the enhanced condition versus the unenhanced and control conditions (combined).

Prevalence of Harsh Parenting

As a second approach, families were compared for the presence or absence of any reported instance of physical abuse or spanking/slapping. The first analysis compared prevalence rates of physical abuse across condition (i.e., the percentage of children who were the targets of any kind of abuse at any time). Children in the enhanced condition were less likely to be physically abused (4%) than were children in the unenhanced (23%) or the control (26%) condition. We conducted a chi-square analysis in which the significance of prevalence levels found in the enhanced condition was compared with that in the combined unenhanced/control conditions. The greater presence of physical abuse in the combined unenhanced/control conditions was found to be statistically significant, $\chi^2(1, N = 73) = 5.52, p < .05$. Across conditions, the most common types of abuse were infant shaking (9%) and hitting or trying to hit the infant with an object (9%). The only other kinds of abuse reported were kicking/biting or hitting with a fist (3%), beating up (1%), and burning or scalding (1%).

A similar pattern of findings was found for infant spanking and slapping. These punitive (but legally nonabusive) tactics were demonstrated by 18% of mothers in the enhanced home visitation condition and 42% of mothers in the combined unenhanced home visitation and control condi-

Table 3
Harsh Parenting in Response to Infant Characteristics

Risk group	Enhanced home visitation condition		Unenhanced home visitation and control conditions		Significance of difference
	<i>M</i>	<i>(SD)</i>	<i>M</i>	<i>(SD)</i>	
High-risk infants	.07	(.20)	.42	(.44)	$p < .05$
Low-risk infants	.06	(.14)	.17	(.28)	<i>ns</i>
		$n = 9$		$n = 12$	
		$n = 18$		$n = 32$	
Significance of difference	<i>ns</i>		$p < .05$		

Note. Scores are log 10 transformations of frequency scores. Significance of differences was determined with a 2×2 analysis of variance.

tions. A Chi-square analysis revealed that this difference was statistically significant, $\chi^2(1, N = 73) = 5.04, p < .05$.

Moderators of Harsh Parenting

We conducted follow-up ANOVAs to test whether children's risk characteristics at birth qualified the effects of prevention condition on harsh parenting. The two grouping variables were condition and child risk. Frequency of harsh parenting (logarithmic transformations) was the dependent variable. We predicted that the highest levels of harsh parenting would be shown by mothers in the unenhanced home visitation or control condition in interaction with high-risk infants. This prediction was tested in a planned contrast analysis in which a weight of 3 was assigned to mothers in the unenhanced or control condition interacting with high-risk infants, and a weight of -1 was assigned to all mothers in the enhanced home visitation condition (high- or low-risk infants) and to mothers in the unenhanced or control condition interacting with low-risk infants. The analysis yielded a $t(68)$ of 2.56, $p = .01$. Means reflecting the observed interaction are shown in Table 3.⁵

Mediators of Harsh Parenting

As an initial step in determining variables that mediate the relationship between condition and (reductions in) harsh parenting, we conducted a series of analyses to determine the effects of participation in different conditions on potential mediating variables. Potential mediating effects included power perceptions, affect, and perceived social sup-

⁵ Although the interaction between condition and risk was not testable for prevalence rates (in view of the fact that prevalence rates involved dichotomous scores), it is interesting to note descriptively that 58% of mothers in the unenhanced home visitation or control condition engaged in harsh parenting with high-risk children, whereas only 10% of mothers in the enhanced home visitation condition did so.

Table 4
Perceived Power, Depression, and Anxiety as a Function of Prevention Condition

Measure	Enhanced home visitation condition (<i>n</i> = 28)		Unenhanced home visitation and control conditions (<i>n</i> = 44)		Significance of difference
	<i>M</i>	(<i>SD</i>)	<i>M</i>	(<i>SD</i>)	
PAT					
Increase in ACF-high	0.46	(1.28)	-0.15	(1.75)	<i>p</i> < .05
Increase in ACF-low	0.28	(1.32)	-0.10	(2.13)	<i>ns</i>
Increase in CCF-high	0.35	(1.21)	0.24	(1.88)	<i>ns</i>
Increase in CCF-low	0.35	(1.63)	0.24	(1.67)	<i>ns</i>
Depicted size of self	3.43	(2.13)	3.08	(1.36)	<i>ns</i>
Depicted size of child	2.05	(1.08)	2.79	(1.61)	<i>p</i> < .05
Changes in BDI depression	-6.23	(9.67)	-1.94	(7.20)	<i>p</i> < .05
Changes in STAI anxiety	6.69	(16.80)	3.29	(12.05)	<i>ns</i>

Note. Increases on the Parent Attribution Test (PAT) scores represent average increases on a 7-point "importance" scale; ACF = adult control factor; CCF = child control factor; depicted size measures are in centimeters. Means on the Beck Depression Inventory (BDI) and the State-Trait Anxiety Inventory (STAI) represent change scores.

port. Only power perceptions were predicted to be uniquely influenced by participation in the enhanced condition.

Perceived power. In the first analysis, a MANCOVA was conducted that included condition as a grouping variable (enhanced vs. unenhanced and control conditions) and six post-condition measures of perceived power. Four measures reflected changes on the four factors of the PAT, and two measures reflected depicted size of self and child, a visual representation of power. The four PAT variables included increases (from intake to post-condition) in importance attributed to causes controllable by self (ACF-high factor on the PAT), increases in importance attributed to causes not controllable by self (ACF-low on PAT), increases in importance attributed to causes controllable by child (CCF-high on PAT), and increases in importance attributed to causes not controllable by child (CCF-low on PAT). The two visual representations included size of drawing of self (post-condition) and size of drawing of child (post-condition). Initial (intake) PAT scores were introduced as covariates. The multivariate effect of condition was significant, $F(6, 60) = 3.13, p = .01$. The only univariate effects that reached significance were (a) increases in ACF-high, $F(1, 65) = 5.13, p = .027$, and (b) depicted child size, $F(1, 65), p = .036$. As shown in Table 4, mothers in the enhanced condition showed greater increases on ACF scores than did mothers in the unenhanced or control condition. In addition, mothers in the enhanced condition depicted children as smaller than did mothers in the unenhanced or control condition. The combined effect is one of a higher perceived balance of power in the enhanced condition than in the unenhanced or control condition.

At the next step in testing the role of perceived power as a mediating variable, we created a combined perceived power measure that included the two measures found to be significantly reactive to prevention condition, that is, increases in importance attributed to causes controllable by self and depicted size of child (reverse scored). Both measures were converted to *z* scores. We asked whether perceived

power mediated the relationship between prevention condition (enhanced > unenhanced or control) and harsh parenting.

We followed the steps proposed by Baron and Kenny (1986). At Step 1, a significant relationship must be shown between the independent variable (condition) and the mediating variable (perceived power). At the second step, a significant relationship must be shown between the mediating variable (perceived power) and the dependent variable (harsh parenting), with the effect of the independent variable (condition) covaried. At the third step, a significant relationship must be shown between condition and harsh parenting. At the fourth step, the relationship shown between condition and harsh parenting must be less when perceived power is statistically controlled than when it is not controlled. In addition, we covaried out the effects of intake levels of ACF-high.

Partial support was found for the role of perceived power as a mediating variable (see Figure 1). Step 2 was confirmed only as a trend. In addition, the predictive power of condition (on harsh parenting) continued to approach significance when the effects of perceived power were covaried. Therefore, perceived power changes do not appear to significantly mediate the effects of condition on harsh parenting.

Affect. In the second analysis, a multivariate analysis of covariance (MANCOVA) was conducted that included condition (enhanced vs. unenhanced or control) as a grouping variable and changes on the two post-condition affective measures (STAI and BDI) as dependent variables. Initial measures (STAI-T and BDI) were introduced as covariates⁶ (means are shown in Table 4). A significant multivariate effect was found for condition, $F(4, 130) = 3.43, p = .01$. Univariate effects only reached significance for the BDI, $F(2, 163) = 3.18, p = .05$.

A regression analysis was again used to determine

⁶ When there were missing scores on any intake measure, the median value for the entire group was substituted.

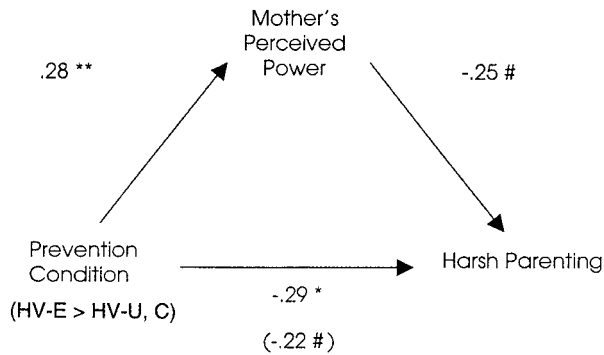


Figure 1. Perceived power as a mediator of the relationship between prevention condition and harsh parenting. HV-E = enhanced home visitation; HV-U = unenhanced home visitation; C = control. Coefficients are beta weights. The beta weight in parentheses reflects the predictive value of prevention condition, controlling for the mediator variable. # $p < .10$; * $p < .05$; ** $p < .01$.

whether declines in depression mediated the relationship between condition and harsh parenting. As shown in Figure 2, the first three steps necessary to establish the role of depressive symptoms as a mediator were supported. That is, condition predicted BDI scores and harsh parenting, and the BDI predicted harsh parenting (controlling for the effects of condition). The requirements of Step 4 were partially fulfilled. That is, condition no longer served as a significant predictor of harsh parenting after the effects of the BDI were statistically controlled; however, the absolute reduction in the predictive power (altered beta) of condition did not reach significance.

Social support. In a third analysis, a MANCOVA was conducted that included condition (enhanced > unenhanced or control) as a grouping variable and changes on the two support measures (Reliable Alliance and Guidance) as dependent variables. Initial measures of both variables were introduced as covariates. No significant multivariate effects were obtained, $F(2, 67) = 2.08, p = .133$. In addition, neither of the univariate effects approached significance.

Child Health

We conducted an ANOVA to assess the levels of child health found for families participating in the three conditions. The analysis included one grouping variable (condition). A combined child health score served as the dependent variable. A significant main effect was obtained for condition, $F(2, 70) = 4.01, p = .02$. Mean scores were .25 in the enhanced condition, $-.05$ in the unenhanced condition, and $-.30$ in the control condition.

Planned contrasts were conducted to determine the support found for the three different models of condition effects. All three models received significant support at less than the .05 level of confidence. Therefore, all further analyses of change in child health were assessed as a function of the three conditions.

Moderators of Child Health

We conducted follow-up ANOVAs to test on an exploratory basis whether children's risk characteristics at birth qualified the effects of condition on child health. The two grouping variables were condition and child risk. Level of child health was the dependent variable. No significant effects were found for the interaction between condition and child risk ($F < 1$).

Mediators of Child Health

Perceived power as a mediator of child health. None of the measures of perceived power were correlated with child health at a level that reached or approached significance. Therefore, no test was made of the role of parents' perceived power as a potential mediator of child health.

Affective changes as mediators of child health. A regression analysis was used to determine whether declines in depression mediated the relationship between condition (enhanced > unenhanced > control) and child health. As shown in Figure 2, the first three steps necessary to establish the role of depressive symptoms as a mediator were sup-

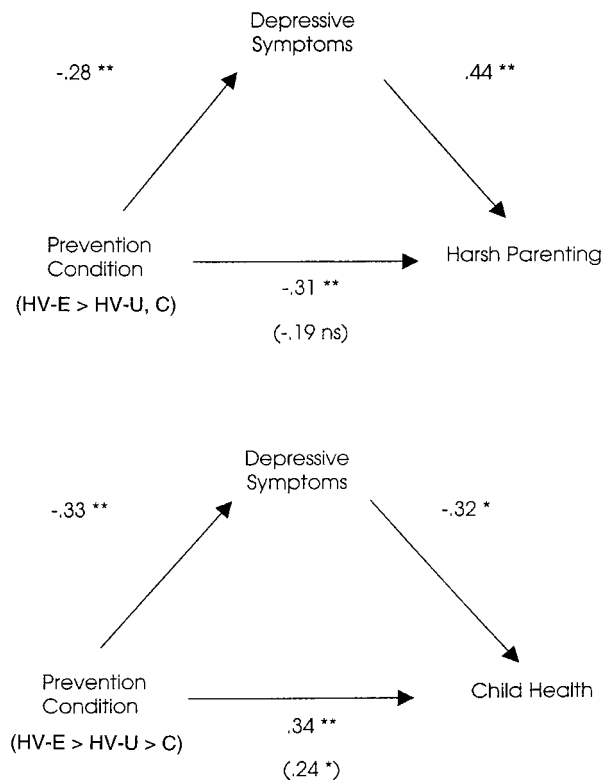


Figure 2. Depressive symptoms as mediators of the relationship between prevention condition and harsh parenting, and between prevention condition and child health. HV-E = enhanced home visitation; HV-U = unenhanced home visitation; C = control. Coefficients are beta weights. The beta weights in parentheses reflect the predictive value of prevention condition, controlling for the mediator variable. * $p < .05$; ** $p < .01$.

ported. That is, condition predicted BDI scores and low child health, and the BDI predicted low child health (controlling for the effects of condition). However, the requirements of Step 4 were not met. That is, condition continued to serve as a significant predictor of child health after the effects of the BDI were statistically controlled.

Social support. Neither of the measures of social support were correlated with child health at a level that reached or approached significance. Therefore, no test was made of the role of parents' perceived social support as a potential mediator of child health.

Discussion

In the study described here, a test was made of the incremental benefits of a cognitive appraisal component within a child maltreatment prevention program. That is, we explored the extent to which a focus on causal and problem-solving appraisal, as added to the features included within the Healthy Start model, would provide significantly greater benefits than would the Healthy Start model alone. In addition, the effectiveness of both programs was compared with a control condition that included only referral information. Findings provided good support for the distinctive benefits of the cognitive features of the program for the prevention of harsh parenting. Physical abuse was successfully prevented only within the cognitive appraisal condition. For child health, however, incremental benefits were found for the three conditions; that is, as program features were added, benefits increased.

Prevention of Harsh Parenting

Overall Effects

Harsh parenting during infancy was effectively prevented as a function of family participation in a home visitation program that included a cognitive appraisal component (enhanced condition). Only 4% of those women who participated in the enhanced condition physically abused their children during the first year of the child's life. In the absence of any type of home visitation (control condition), 26% of mothers physically abused their children during the first year. This level of abuse was not appreciably reduced with the provision of Healthy Start home visitation (unenhanced condition: Healthy Start model); the abuse rate among women in this condition was 23% during the child's first year of life. The most common type of physical abuse was infant shaking—a parenting practice that carries a high risk of mortality or brain damage (Bruce & Zimmerman, 1989; Cox, 1996).

An unexpected benefit was found in terms of the reduction of infant spanking and slapping. The prevalence rate of corporal punishment in infancy was reduced from the high levels found in the unenhanced or control conditions (42%) to 18% in the enhanced home visitation condition. The infant spanking/slapping rates found in the unenhanced and control conditions are comparable to those reported by Straus and Stewart (1999) within at-risk populations (37%).

The rates found in the enhanced condition are comparable to those reported by Holden, Buck, and Stickels (2000) for advantaged, college-educated parents (15%). The significance of this outcome stems from the fact that spanking has been found to foster children's aggressive behavior (e.g., Strassberg, Dodge, Pettit, & Bates, 1994).

Moderators of Effects

Infant risk (defined in terms of relatively low Apgar scores and preterm status) served as a moderator of the effects of prevention condition on harsh parenting. Among low-risk infants, mothers in all conditions made little use of harsh parenting practices. Among higher risk infants, on the other hand, only mothers in the enhanced condition made low use of harsh parenting practices. In contrast, almost half of the mothers in the unenhanced or control condition made use of harsh parenting practices with their high-risk infants. This suggests that the problem focus of this approach was well-suited to the implicit problems that are more likely to be posed by at-risk children.

At-risk children (as defined in this article) pose a number of caregiving challenges. However, both risk categories (low Apgar scores and preterm status) have been found to be associated with attentional unresponsiveness. Attentional unresponsiveness is an aversive but relatively ambiguous stimulus feature. That is, when infants are unresponsive, no secure inferences can be drawn regarding the basis of their inattention. In this context, parents easily rely on their "default" cognitions about caregiving relationships—as suggested by the formulations of Bugental and her colleagues (e.g., Bugental et al., 2000) and Dodge and his colleagues (e.g., Nix et al., 1999). Thus, if parents believe that they are at a power disadvantage, they may interpret the child's attentional pattern as reflecting social rejection.

This finding has significance for the selection of families most in need of prevention services. Historically, selection criteria have focused on environmental risk and parental risk. Our findings suggest that child medical risk is a key criterion variable that should be given greater weight. Over the years, evidence has emerged to suggest that those children who require exceptionally high levels of care or who might be interpreted as unresponsive or resistive are more likely to be abused. Although we have focused attention here on two common types of birth complication, the list of characteristics that set children at risk is long and diverse. It includes chronic illness, a variety of learning and communication disorders, autism, and physical disabilities. (e.g., Altmeier, O'Connor, Vietze, Sandler, & Sherrod, 1984; Brown, Cohen, Johnson, & Salzinger, 1998; Hunter, Kilstrom, Kraybill, & Loda, 1978; White, Benedict, Wulff, & Kelley, 1987). To the extent that our findings are replicated, particular advantages are suggested for an intervention that focuses on shifting parents' ways of thinking about their caregiving problems with such children.

The distinctiveness of the beneficial effects of the cognitive appraisal program will need to be replicated. That is, further work is needed to substantiate that this approach to child abuse prevention produces unique benefits for the

parents of at-risk children. However, findings are consistent with a transactional approach to child abuse. Just as abuse levels are high in response to a “difficult” child among parents who have low perceived power, abuse levels are prevented when parents who have a “difficult” child are assisted in reformulating their ways of appraising potential causes and solutions—a tactic that provides them with enhanced control or power.

Mediators of Effects

Two mediating processes were measured here as potential mediators of program effects. One potential process involved a shift in parental cognitions about the balance of power in their relationships with children. Although mothers participating in the enhanced condition did show expected changes (i.e., significant increases in perceived power of self and decreases in perceived power of child), these changes did not serve to mediate reduced levels of harsh parenting. Stronger support was found for the role of altered affect as a mediating process. That is, there were indications that reductions in maternal depression served to influence subsequent reductions in use of harsh parenting tactics.

The affective mediational effects observed may reflect changes in mothers’ capacity to experience empathy for their infants. As suggested by Arbuthnot, Gordon, and Jurkovic (1987), affective perspective taking (empathy) appears to be more important than cognitive perspective taking in inhibiting aggression. As memory-based processing (reliance on schematic representations of relationships) comes to be replaced with data-based appraisal, parents may be more likely to experience empathic concern for their children. That is, as unaware and automatic ways of interpreting caregiving experiences come to be replaced with reflective, “on-line” appraisal, opportunities arise for altered feelings and altered parenting practices (as suggested by Rudy & Grusec, 1999). Reductions in depressive symptoms, in turn, foster an increased ability to engage in effortful rather than automatic processing (Hartlage, Alloy, Vazquez, & Dykman, 1993), thus increasing receptivity to altered interpretations and enhanced use of nonaggressive caregiving strategies. These notions are consistent with the work of Dix and his colleagues (e.g., Dix, 1993) on the relationship between attributions, affect, and behavior. That is, changed appraisal processes foster reductions in negative affect, which in turn feed forward to influence parenting tactics and feed backward to foster more positive cognitions.

Promotion of Child Health

A somewhat different pattern of program effects was obtained for child health outcomes. Although the highest level of benefits was observed for families in the enhanced home visitation condition, benefits were also found for families in the unenhanced home visitation condition (in comparison with families in the control condition). This linear pattern suggests an incremental process in which

children’s health outcomes are increasingly enhanced as program features are added.

These findings provide support for the approach and goals of Healthy Families America programs (Daro, 1998). As described earlier, the strategy of these programs has been to include all features of past programs found to be beneficial and to provide services to families on a universal basis (primary prevention). Just as there are many contributing factors to children’s naturally occurring health outcomes, there may be many programmatic features that can combine to enhance child health. Whereas physical abuse may primarily reflect a specific combination of dyadic risk factors (and may be reduced when programs are directed to these risk factors), children’s overall health may reflect an additive combination of many factors and may be enhanced by many approaches. Although the enhancement of parents’ problem-solving ability (enhanced condition) is useful in fostering child health, the provision of parent education and linkage to services in the community (unenhanced condition) are also useful. In addition, health may improve for all children as program features are added.

Limitations of the Study

There are a number of important limitations that should be noted for this study. For example, the sample size was small. Although the effects were large, concerns may be raised concerning the replicability of reported findings. Thus, it will be important to conduct further tests of the benefits that follow from the prevention methods introduced here. It will also be valuable in future work to unpack the various components that may produce beneficial effects. We made use of an approach that incorporated changes in both primary appraisal processes (causal analysis) and secondary appraisal processes (problem-focused coping strategies). It will be useful to determine the individual and combined advantages of these two components. Thus, it may be that secondary appraisal processes accounted for a greater portion of the observed benefits than did primary appraisal processes.

As a second limitation, the study focused on an immigrant population from Mexico who were at moderate risk for child maltreatment. At the same time, this “limitation” also presents a strength in that there is little evidence on the effectiveness of prevention programs with this population. Although it was not our intention to target this cultural group, families from this background were most commonly identified by health care professionals as eligible for participation (as based on their level of risk). In the future, it will be useful to extend the program to a more ethnically and economically diverse population (who are also at different levels of risk) in order to test the generalizability of observed effects. In this way, it will be possible to determine whether program benefits are extended to higher risk or lower risk families and whether they are extended to families from different cultural and economic backgrounds.

Another kind of limitation is present as a result of the short-term nature of the evaluation effort. That is, child outcomes were measured when children reached 1 year of

age, but no follow-up measures were taken. Constraints were present in obtaining follow-up measures as a result of the characteristics of this population (a population that included a high number of undocumented immigrants). That is, families in this group move frequently and are not easily located in computer records (because they do not easily come to the attention of reporting agencies and because family names are not reported in a consistent fashion and thus are not easily located). In ongoing research with a more stable population, efforts will be made to track the results of these programs for a longer time period.

The study may also be criticized in that it does not include observational data. The extent to which this is a problem differs for different measures. For mediating variables, reliance on self-report is believed to be defensible in that our interest was in changes in parents' cognitions, affect, and perceived support. As some of the measures employed (e.g., parental drawings) are unique to this study, it will be important to replicate findings with other measures. For outcome variables, the rationale takes a different course. As explained earlier, information on this particular population rarely appears in official records, limiting our ability to determine their representation in reports of suspected child maltreatment. We demonstrated, however, that the self-reports of harsh parenting were largely immune to self-presentation biases (as demonstrated in the lack of a significant relationship to social desirability scores). In part, this reflects cultural differences in the perceived acceptability of harsh practices. It may be argued that parents in the cognitively based home visitation program became better able to bias their reports than did other parents. However, it should be recalled that parent education was matched in the enhanced and the unenhanced home visitation conditions, and thus that they were equally exposed to training regarding acceptable parenting practices. For child health reports, there was high agreement between parents in their independent assessment of the child's health; this convergence provides evidence for the accuracy of these measures.

As a constraint on the interpretation of findings, one can argue that the advantages observed in the home visitation program may have reflected the biases of home visitors. As these individuals implemented all conditions, it is possible that they favored the enhanced condition over the unenhanced condition. Acting against this concern is the fact that mothers in the enhanced condition demonstrated the predicted changes in their cognitions about power or control in their relationships with their children.

As a final limitation, future work is needed on the role of the father in the success of maltreatment prevention. Too few fathers participated in the program described here to allow any reliable test of the effects of their involvement.

Conclusions

The combined findings obtained in this study suggest that the same program features may not have the same benefits for all child outcomes. Physical aggression against children may be more uniquely influenced by dyadic transactions (parental appraisal processes and child stimuli) than are

children's health outcomes. The unique advantages of the enhanced condition for parents with at-risk children suggests that secondary prevention may be appropriate for this group. We have shown—on what may be viewed as a pilot basis—that home visitation that is focused on redirected cognitive appraisal carries a high potential for preventing harsh parenting with high-risk children. The production of more generalized positive outcomes may be more consistent with a contextual-ecological model that promotes stress reduction—the connection to community agencies and other sources of social support—and provides parent education (a primary prevention approach).

Implications for Application and Public Policy

A number of public policy implications can be derived from the research described in this article. As a methodological issue, it is important that new child maltreatment prevention programs be tested in ways that allow a secure test of the presence of desired outcomes along with providing information regarding the mediating processes that may account for those outcomes. Only by random assignment of families to conditions is it possible to draw secure inferences regarding the relative benefits of different programs. In addition, any assumptions regarding mediating processes should be based on appropriate statistical tests, not on personal judgment. For example, it might easily be assumed that increases in child health (as fostered by parent education) would serve as mediators of reductions in harsh parenting (not demonstrated here). In addition, consideration should always be given to the role of moderator variables, that is, to systematic variations in the utility of programs for preventing child abuse in different parent and child populations. In the present study, for example, at-risk children proved to be the greatest beneficiaries of the cognitively based home visitation program. Finally, program development should allow for the possibility of determining the incremental utility of specific program features. Although omnibus approaches are justified in pilot research, they need to be followed with evaluation research programs that provide a test of the key program features that lead to desired changes.

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