The Role of Mental Health Factors and Program Engagement in the Effectiveness of a Preventive Parenting Program for Head Start Mothers

Nazli Baydar, M. Jamila Reid, and Carolyn Webster-Stratton

Head Start centers were randomly assigned to intervention (parent training) or control conditions, and the role of maternal mental health risk factors on participation in and benefit from parent training was examined. Parenting was measured by parent report and independent observation in 3 domains: harsh/negative, supportive/positive, inconsistent/ineffective parenting. Structural equation modeling showed that parent engagement training was associated with improved parenting in a dose-response fashion. Mothers with mental health risk factors (i.e., depression, anger, history of abuse as a child, and substance abuse) exhibited poorer parenting than mothers without these risk factors. However, mothers with risk factors were engaged in and benefited from the parenting training program at levels that were comparable to mothers without these risk factors.

Harsh and ineffective discipline practices, as well as nonsupportive and nonresponsive parenting behaviors, have long been identified as risk factors associated with the development of early antisocial behavior and low social competence in children (for a review, see Hawkins et al., 1998). Correspondingly, parents who are emotionally positive and who give attention to their children's prosocial behaviors are more likely to have nonaggressive children with self-regulatory skills, suggesting that these parenting

skills may serve as protective factors against the development of behavior problems. Several parental attributes or stressful life circumstances are associated with harsh and nonsupportive parenting styles, which in turn negatively influence children's outcomes (McLoyd, 1990). Among these parental attributes are psychological factors such as depression, substance abuse, other mental health problems, and having had negative parenting role models as children (Reid & Eddy, 1997). These psychological parent risk factors occur at higher rates among parents who are socioeconomically disadvantaged and experience high levels of environmental stressors (Webster-Stratton, 1990; Webster-Stratton & Hammond, 1998).

The present study addressed several psychological factors that may be related to the effectiveness of a parent training program. Specifically, the role of these factors in accounting for the variability in the parents' engagement in the program, the reductions in harsh and ineffective parenting, and gains in supportive parenting was investigated in a group of socioeconomically disadvantaged parents whose children attended Head Start.

Head Start, which enrolls more than 800,000 children in United States each year in its preschool program, is an ideal context for implementing prevention and early intervention parenting programs for a population at high risk for maladaptive parenting and for children at risk of developing conduct problems because of the increased risk factors associated with socioeconomic disadvantage. Indeed, studies with Head Start families have

reported that more than a one third of these families had more than three major family risk factors (e.g., single parenthood, poverty, depression, life stress, psychiatric illness, parent history of drug abuse, child abuse, spouse abuse; (Webster-Stratton & Hammond, 1998). Although parent education has always been an important mission of Head Start, few programs have placed an emphasis on the use of comprehensive and empirically validated parenting programs to help parents strengthen their parenting skills so as to promote their children's social competence and reduce behavior problems. Head Start family service providers typically have had little formal training in implementing such parenting curriculum or in running parent groups. Leaders in the field are calling for empirically validated parenting and teaching programs that address the emotional and behavioral needs of Head Start children (Lopez, Tarullo, Forness, & Boyce, 2000; Yoshikawa & Zigler, 2000).

The Incredible Years Parent Training Program has had proven effectiveness in a series of six randomized control group studies with clinically referred young children with conduct problems (Webster-Stratton, Mihalic, et al., 2001) and therefore has offered promise as a potential school-based selective prevention program to strengthen parenting skills. Two previously reported randomized trials in Head Start (Webster-Stratton, 1998b; Webster-Stratton, Reid, & Hammond, 2001) showed that when the Incredible Years Parenting Training Program was offered as a universal prevention program to all parents enrolled in the experimental Head Start centers (regardless of whether they had children with behavior problems) there were significant improvements in parent–child interactions, reductions in children's negative behaviors, and increases in their prosocial behaviors compared with parents and children from control Head Start centers.

This work shows the promise of preventive parenting programs such as this one and others (Gross, Fogg, Webster-Stratton, Garvey, & Grady, 2003; Spoth, Redmond, & Shin, 1998; Yoshikawa, 1994) for strengthening parenting skills and reducing child problem behaviors. Little is known in the prevention-focused parenting literature, however, about risk factors that determine which parents will benefit from such programs and which will not. There has been a suggestion from the treatment-focused parenting literature that parents of children diagnosed with oppositional defiant disorder/conduct disorder who are socioeconomically disadvantaged or who have mental health problems (e.g., depression), or substance abuse problems, or who

have experienced severe abuse as children will be either erratic in their attendance and level of participation in the program or likely to drop out and unlikely to benefit substantially from such programs (Kazdin, Holland, & Crowley, 1997). It has been suggested that for treatment, parenting programs of less than 20 hr are less effective than longer programs (Kazdin & Mazurick, 1994). However, much less is known about causal factors that affect parents' ability to engage in and benefit from prevention-focused parenting programs, where presumably the motivation for parents to attend is much less because the child has not been identified as having a problem that requires assistance. Those reports of prevention-focused parenting programs that do exist have suggested that particularly for high-risk populations, low recruitment and poor parent participation rates may be influenced by factors such as low socioeconomic status (Coie et al., 1993), failure of programs to provide transportation or day care, distance of program from home, time demands, and scheduling conflicts (Biglan & Metzler, in press; Spoth, Goldberg, & Redmond, 1999; Spoth, Redmond, Hockaday, & Shin, 1996).

The availability of the present parenting program was increased by reducing as many of the logistical and psychological barriers to attendance as possible. Day care, dinners, flexible evening hours, and make-up sessions were provided, and programs were delivered in conveniently located neighborhood schools where the children attended preschool. Parents were invited to come to parent groups with partners, friends, or family members and were engaged in the learning process through a collaborative, problem-solving discussion style whereby each family's strengths and goals for their children were highlighted (see Webster-Stratton & Herbert, 1994, for a description of the collaborative process.) It appeared that these efforts were reasonably successful at motivating and recruiting low-income families as indicated by the fact that more than 75% of families indicated initial interest in the parenting program, and of those families, 74% attended at least 50% of the parent groups offered. Other preventive parenting programs that have attended to these practical barriers in similar ways have also reported that low-income parents have taken advantage of opportunities to participate (Spoth et al., 1999; Spoth et al., 1998).

Although there are a few primary prevention studies that explore family factors related to parents' willingness to enroll in such programs (Spoth et al., 1998), there is scant research in the prevention literature of particular parental mental health risk

factors that influence the parents' ability to engage in and benefit from parenting groups. Little is known about the length of a parenting program or number of parenting sessions required to bring about parent behavior change.

The present study is unique in three aspects. First, it considered several mental health risk factors for maladaptive parenting, and it assessed their influences on the engagement in and benefit from a preventive intervention. Second, this study measured engagement in a parenting program not only by absolute attendance (i.e., dosage of program received) but also by weekly session observations of level of parent discussion and involvement in the parent groups and records of parent homework completed. Third, this prevention study of low-income families used independent observations of parent–child interactions in the home to assess change in parenting behaviors. Most other prevention studies rely on parent report of parenting change, which is beset by reporting bias.

The major purpose of the present study was to improve the understanding of the way some psychological risk factors influence mothers' parenting, mothers' participation in parent training programs, and their ability to benefit from the parenting program. A previous study addressed the way race and ethnicity influenced the effectiveness of the same program and found no such influences (Reid & Webster-Stratton, 2001). In concert with the objectives of the parenting program, the analyses presented here focused on decreasing harsh and ineffective parenting practices and increasing supportive parenting. These parenting domains were targeted for intervention and analyses because they serve as key risk (harsh/coercive and inconsistent) or protective (supportive/responsive) factors in the development and maintenance of conduct problems (Patterson, Reid, & Dishion, 1992). The following three hypotheses were addressed:

- Engagement in the parenting training program will predict higher levels of parenting skills at the conclusion of the program, in a dose-response fashion.
- Mothers who have elevated levels of mental health risk factors will attend the parent training program and will be engaged in training-related activities (e.g., homework, discussion, etc.) as much as parents with lower levels of these risk factors.
- Mothers with high levels of mental health risk factors will benefit from the parent training program by displaying reductions in their harsh

and ineffective parenting and increases in their supportive parenting behaviors. These changes will be comparable to changes made by intervention mothers with lower levels of the risk factors. Regardless of mental health risk factors, mothers in the intervention condition will have improved parenting skills after the training program compared with control mothers.

Method

Study Design

This study combined assessments from three cohorts of families enrolled in Puget Sound area Head Start centers who participated in the two different prevention studies. Two cohorts of participants entered Study 1 in the fall of 1993 and the fall of 1994 (intervention results from Study 1 are reported separately in Webster-Stratton, 1998b). The third cohort entered Study 2 in the fall of 1997 (intervention results from Study 2 are reported separately in Webster-Stratton, et al., 2001). Both studies used a quasi-experimental design wherein Head Start centers were matched on several variables (ethnicity of children, number of classrooms, experience of teachers) and randomly assigned to either (a) an experimental condition in which parents were invited to participate in the Incredible Years Parenting Training Program, or (b) a control condition consisting of the regular Head Start curriculum. With the support of the Head Start administration, the project was explained to all Head Start staff and to the parent policy council before randomization. All staff understood and agreed to the research design and understood they could be randomly assigned to either intervention or control condition and would have no say in this decision, and none of the centers refused to participate or changed their minds after randomization. In total, 14 Head Start centers were randomly assigned (via lottery) with two classrooms assigned to the intervention condition for every one assigned to control condition. Participant enrollment procedures for Studies 1 and 2 were identical and are presented in detail elsewhere (Webster-Stratton, 1998b; Webster-Stratton, Reid, et al., 2001).

Intervention

The intervention consisted of the Incredible Years Parenting Training Program and was offered during the year children were in Head Start. A detailed description of the program content, training process,

and integrity checks can be found in Webster-Stratton and Hancock (1998). The program teaches child-directed play skills, positive discipline strategies, effective parenting skills, strategies for coping with stress, and ways to strengthen children's prosocial and social skills. Study 1 offered the curriculum in weekly 2-hr sessions for 8 to 9 weeks. Based on parent and leader feedback from Study 1, the same curriculum was offered in Study 2 but was lengthened to 12 weekly 2-hr sessions to give more time for discussion. When Study 1 and Study 2 differences were modeled in multivariate models of intervention effects, no differences were found other than those in the preintervention characteristics of the mothers. The mothers in Study 2 had a lower average level of harsh/negative parenting.

In both studies the program was translated and offered in Vietnamese and Spanish. In centers where enough parents spoke one of these languages, a Spanish or Vietnamese group was offered by trained native speakers. In other centers, non-English-speaking parents participated in an English group using a translator.

A fundamental tenet of the Incredible Years Parenting Training Program is that parents care about their children's welfare and would prefer to behave in ways that facilitate their child's development and success in school. Within the group framework, parents define their own goals and then formulate principles of behavior that will help them reach those goals. The format of the program is easily adapted to meet the needs of parents from many different cultures and backgrounds.

All training sessions were run by a certified parenting clinic leader who was paired with a family service worker from the Head Start site. Ongoing supervision in the content and techniques of the intervention was provided for group leaders by the program developer. An intervention manual specified the content of each session, activities, and homework assignments. Weekly records kept by group leaders indicated that all groups covered the required materials. In the control centers, families, teachers, and family service workers continued their regular Head Start curriculum including parent education on topics such as stress management, nutrition, self-care, and dental care (these occur once every 2 months in most sites).

Families in the intervention and control conditions completed identical assessments at pre- and post-intervention. Data reported here are on mother behavior as measured by parent interview and independent home observations of parent–child interactions at pre- and post-intervention assess-

ments. All data were collected during two home visits by trained interviewers and observers who were blind to the family's treatment condition. When possible, interviewers were matched ethnically or linguistically to the families, and translators were provided for non-English-speaking families. At the home visit, which lasted for 2 to 3 hr, parent report data were collected. Parents were given the option of completing questionnaires in interview format or recording their written answers independently and confidentially. Questionnaires were translated into Spanish and Vietnamese, if necessary. Parent–child observations, which lasted approximately 1 hr (per parent), were conducted during a second home visit usually within 1 week of the interview. Parents were paid $50 on completion of the home visits at each assessment phase. After fall preintervention assessments were completed (late November), parents from the intervention sites were invited to participate in the Incredible Years Parenting Training Program. The program began after the winter holidays (with school breaks, a 12-session group often took 4 months to complete). In the late spring of the school year, families from the experimental and control centers were reassessed using the same parent reports and home observations. The number of assessment contacts and procedures were identical for both the intervention and control conditions.

Data and Measures

Using information from parent reports, independent observations, and observer ratings (specific instruments described later) measures of harsh/negative, supportive/positive, and inconsistent/ineffective parenting were developed. Thus, each of the three domains of parenting of interest was assessed by three instruments: Parenting Practices Interview (PPI) self-report, Dyadic Parent–Child Interactive Coding System–Revised (DPICS–R) independent observation, and Coder Impression Inventory (CII) observer ratings instruments. All scale scores described in the following sections were expressed as percentile scores for ease in interpretation.

PPI. The PPI questionnaire was adapted from the Oregon Social Learning Center's (OSLC) Discipline Questionnaire and was revised for preschoolers. The present analyses were based on the 19 items of the PPI that were comparable across Studies 1 and 2. These 19 items were grouped into three sets based on content. These sets consisted of items related to parent negativity/hostility, parenting competence in response to positive/prosocial as well as negative

behaviors of the child, and parent's ineffective strategies in dealing with problem behaviors. Each set of items were then separately analyzed using exploratory factor analyses with varimax (orthogonal) rotation. The sets of items that represented each of the three parenting domains yielded dominant factors that accounted for 50%, 44%, and 33% of their joint variance for harsh, positive, and inconsistent parenting, respectively. Items that had a dominant factor loading exceeding 0.3 were taken together to form a scale representing the corresponding domain. These scales are referred to as the PPI Harsh/Negative Parenting scale, PPI Supportive Parenting scale, and PPI Ineffective Parenting scale, and they constitute the self-report parenting scales used in the analyses presented here. The PPI Harsh/Negative Parenting scale included five items such as spanking or slapping the child and showing anger when punishing the child. The PPI Supportive Parenting scale included four items such as praising the child when child behaved well, as well as using positive disciplinary strategies. The PPI Ineffective Parenting scale included six items that described lack of follow-through in discipline and letting the child get around the rules. The internal reliability coefficients (Cronbach's α) of the scales constructed from these items were .73, .57, and .63, respectively. To assess the stability of these scales over time, correlations between pre- and post-assessments were estimated for parents who were in the control condition. The time between the two assessments was about 7 months. The correlation for the PPI Harsh/Negative Parenting scale was very high ($r = .77$, disattenuated $r = 1.05$), indicating a high level of stability in this parenting style among parents who did not receive parenting training. The time series correlations for the PPI Positive scale and the PPI Inconsistent Parenting scale were .50 (disattenuated $r = .88$) and .57 (disattenuated $r = .90$), respectively.

DPICS–R. The DPICS-R (Robinson & Eyberg, 1981; Webster-Stratton, 1985a) is a thoroughly researched observational measure developed specifically for recording behaviors of conduct-problem children and their parents at home. Investigations of the DPICS–R indicate that the behavioral measures are justified on content grounds, that outside reports of behavior coincide satisfactorily with the DPICS–R scores, and that expected behavioral changes following intervention are readily indicated by DPICS–R scores (Webster-Stratton & Fjone, 1989). The coding system was identical for Studies 1 and 2. The same staff member trained coders for both studies, and there was a 50% overlap in the coders for the two

studies. Observers were trained until they achieved interobserver agreement rates of at least 75% with an established observer on two consecutive occasions. For both studies, reliability data were assessed by sending out two observers for approximately 20% of the home observations at each assessment phase.

In both studies, mothers were observed interacting for 30 min with their child at home. Observations were conducted when all family members were in view of the observer. No telephone calls could be made and no visitors were allowed to be present. Aside from these changes in family routine, parents were asked to do what they would normally do at the time of the observation.

Three summary scores constructed based on DPICS–R coding system were used in the analyses presented here. These were the DPICS Harsh/Negative Parenting scale, DPICS Supportive Parenting scale, and DPICS Ineffective Parenting scale. The procedure for constructing scale scores was similar to that applied to parent-report (PPI) items. The codes were grouped into three sets based on content. For example, the number of direct commands or criticisms given to the child, and a 5-point coder rating of mother's negative valence (from exuberant positive affect to unrestrained negative affect) were taken as indicators of harsh and negative parenting. The items assessed the frequency of positive interactions between the parent and the child and positive valence of the parent and were taken as indicators of supportive parenting. The items that represented parenting problems such as inappropriate, excessive, or indirect commands were taken as indicators of ineffective parenting style. These three sets of items were separately analyzed with exploratory factor analysis (with varimax orthogonal rotation), and the resulting dominant factors accounted for 43%, 47%, and 32% of the joint variance of each set, respectively. There were six, five, and seven items in DPICS–R Harsh/Negative scale, DPICS Supportive scale, and DPICS Ineffective Parenting scale that had dominant factor loadings exceeding 0.3. These were taken together to form the three scale scores. The internal reliabilities of the scales were .67, .75, and .51, for Harsh/Negative Parenting scale, Supportive Parenting scale, and Ineffective Parenting scale, respectively. The 7-month stability correlations for the control condition mothers were .50 (disattenuated $r = .75$), .50 (disattenuated $r = .67$), and .31 (disattenuated $r = .61$), for the three scales, respectively.

CII. The CII was adapted from the OSLC's Impression Inventory and consists of a questionnaire that asks coders to rate parenting style and child

affect and behavior on a Likert-type scale. Coders completed the CII in their cars after the DPICS–R home observation had been completed. The same instrument was used for Studies 1 and 2. Three of the seven scales developed on the basis of the CII items were used in the present analyses. These were: CII Harsh/Negative Parenting scale, CII Supportive Parenting scale, and CII Ineffective Parenting scale.

Construction of the CII scales followed the approach described for the PPI and DPICS–R scales. Items were grouped into three sets based on content. Exploratory factor analyses of these sets (with varimax orthogonal rotation) were conducted separately, and all items that had dominant factor loadings exceeding 0.3 were included in the final scales. These dominant factors accounted for 46%, 38%, and 40% of the joint variance of negative, supportive, and ineffective parenting items, respectively. The CII Harsh/Negative Parenting scale included 11 items such as parent sarcasm, parent provoking arguments, and parent inducing guilt. The CII Supportive Parenting scale included 10 items such as modeling positive behaviors, paying attention to child's questions, and positively reinforcing child's prosocial behaviors. The CII Ineffective Parenting scale included 13 items such as making unreasonable requests, tracking the child too closely, being tentative in providing direction to the child. The internal reliability for the CII Harsh/Negative Parenting scale was .86, CII Supportive scale was .76, and the CII Ineffective scale was .81. The correlations of the CII scale scores over 7 months for the control condition mothers were .41 (disattenuated $r = .48$), .32 (disattenuated $r = .42$), and .36 (disattenuated $r = .44$), respectively. The magnitudes of these correlations were lower than those for the maternal reports (PPI) reported earlier and observers' objective coding of parent behaviors (DPICS), indicating that observer impression measures, to some extent, are influenced by situational factors and observer specific factors.

In general, observational measures correlated well with each other (.5–.7 range) and self-report measures correlated weakly with the observational measures (.1–.3 range). These correlations are similar to the order of magnitude reported by other studies that included multi-informant assessments (Feinberg, Neiderhiser, Howe, & Hetherington, 2001). Thus, although there is some overlap between parent self-reports and observer reports of parenting, it is likely that there are some aspects of parenting noted by observers that are not shared by the parents. This could be because of bias in reporting by the parents or situational factors that may influence observer reports more strongly than the parent reports (Stoolmiller, Eddy, & Reid, 1999).

Parenting risk factors. Five parenting risk factors associated with mothers' mental health were considered here: anger/aggression, depressive symptoms, substance use, experience of harsh parenting as a child, and experience of abusive parenting as a child. Anger/aggression was assessed by a self-report measure, the Brief Anger-Aggression Questionnaire (BAAQ; Maiuro, Vitaliano, & Cohn, 1987). This was a six-item measure developed for the assessment of anger levels (Cronbach's $\alpha = .82$). Depressive symptoms were assessed by the Center for Epidemiological Studies Depression Scale (CES–D), a reliable and valid index of self-reported depressive symptoms (Radloff, 1977). Substance use was assessed by a single-item self-report indicator of whether the mother had any alcohol or drug abuse history. The parents' own experiences of parenting when they were children were self-reported by Assessing Environments III—History of Parents' Childhood Parenting Experiences (Berger, Knutson, Mehm, & Perkins, 1988). Two scale scores based on the items of this assessment were used here. The Harsh Parenting History Scale consisted of 7 items that assessed harsh or inappropriate discipline in early childhood and adolescence (Cronbach's $\alpha = .85$). The Abusive Parenting History Scale consisted of 10 items that assessed physically abusive parenting such as punching, choking, kicking, severely beating (Cronbach's $\alpha = .80$). The two parenting history scale scores were highly correlated ($r = .70$, disattenuated $r = .85$).

In some analyses presented here, indicators of presence or absence of a risk factor were used rather than interval-level measures of risk. In these analyses, the following cutoff scores were used to construct risk indicators: BAAQ score of 9 or above was taken as an indicator of anger problems (Maiuro et al., 1987); CES–D scale score of 16 or above was taken as an indicator of depressive affect (Radloff, 1977); harsh and abusive parenting scale scores above the 40th percentile were taken as indicators of risk associated with experience of poor parenting history.

Program engagement. Program engagement was assessed by three measures: (1) the number of parent training sessions attended by the mother, (2) the percentage of homework assignments completed by the mother, and (3) the group leader's average rating of the mother's level of engagement in group discussion during the sessions. The latter two indicators represented the behavior of the participants while they attended the parent training

Table 1
Characteristics of the Study Sample

Characteristic	Control group ($N = 275$)	Intervention group ($N = 607$)
Caucasian mothers (%)	56.0%	60.8%
African American mothers (%)	19.2%	13.7%
Hispanic mothers (%)	13.7%	9.0%
Asian/Pacific Islander mothers (%)	7.0%	11.0%
Age of the study child in months (mean)	56.2	55.8
Male study children (%)	55.1%	51.4%
Mother's BAAQ score (0–24, mean)	6.2	6.6
Mothers with anger problems (BAAQ $\geqslant$9, %)	25.2%	30.6%
Mother's CES–D score (0–51, mean)	14.5*	16.2
Mothers with depressive affect (CES–D $\geqslant$16, %)	38.3%	45.0%
Harsh parenting scale score when young for the mothers (0–100, mean)	30.4	33.0
Mothers who experienced harsh parenting (>40th percentile, %)	33.7%	35.1%
Abusive parenting scale score when young for the mothers (0–100, mean)	27.9	29.4
Mothers who experienced abusive parenting (>40th percentile, %)	34.3%	34.1%
Mothers with substance abuse history (%)	16.1%*	23.8%

Note. BAAQ = Brief Anger-Aggression Questionnaire; CES–D = Center for Epidemiological Studies Depression Scale.
*A significant difference of means t test, two-tailed) or percentages (chi-square test) of the intervention and control groups at $p < .05$.

program. As such, they provided indicators that go beyond presence in a training session.

Program attenders. In some analyses of intervention effectiveness, groups of participants were compared based on "meaningful attendance." To operationally define *meaningful attendance,* exploratory analyses were conducted and revealed that after three sessions, parents began benefiting from parenting training. Beyond three sessions, additional sessions brought increased benefits in a dose-response fashion. When an indicator of meaningful attendance was needed to delineate discrete groups of mothers, an indicator was used that distinguished parents who attended less than three sessions from those who attended at least three. Mothers who attended at least three sessions are referred to as attenders in the remainder of this article. Note that, on average, attenders were present at 7.7 training sessions. Thus, benefits experienced by most attenders resulted from many more than the three-session cutoff.

Sample

Baseline descriptive statistics for demographic characteristics and mental health risk factors are provided in Table 1. These data indicate the high level of risk of the sample. Based on the cutoff scores for the BAAQ and the CES–D assessments, more than one fourth of the mothers had anger problems and more than one third had depressive affect. Many had experienced poor parenting in their past, and more than one fifth self-reported a history of

substance abuse. Additionally, one third had experienced abuse as children. These statistics profiled a group of mothers with very high levels of mental health risk factors. As such, this sample was at high risk for displaying poor parenting skills that could pose a significant risk for child behavior problems.

As indicated in Table 1, there were few significant differences between the characteristics of the mothers in the intervention and control conditions. Centers were matched and then randomly assigned on key demographic variables (such as ethnicity) to help control for differences; nevertheless, because the random assignment was conducted at the center level, some differences between the intervention and control conditions remained. Specifically, mothers in the intervention centers had higher depressive symptom scores and a higher likelihood of having a substance abuse history. Given the comparison of a large number of demographic and mental health risk factors between the groups, these few differences would have been expected by chance.

Methods of Analysis

Program effectiveness was modeled using structural equation models (SEMs) with means and intercepts (AMOS software; Arbuckle, 1997). All estimates were obtained by the maximum likelihood method. SEMs provided four advantages for analyses as compared with other methods of analyses such as analysis of variance. First, the SEMs could incorporate measurement submodels allowing the
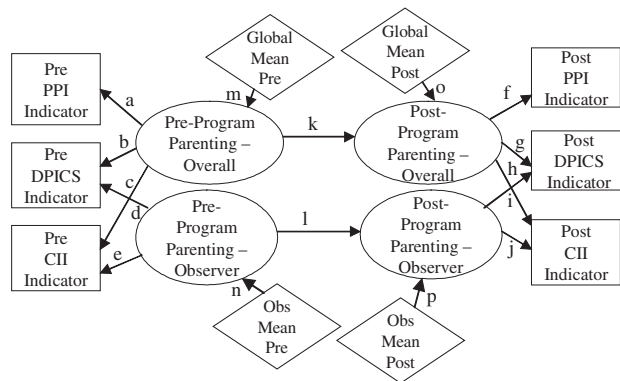
Figure 1. Model structure for the parenting intervention effectiveness models. Following standard measurement model specifications, paths c, d, h, and i were set to 1 to ensure model identification. Obs Mean Pre = the mean for the observer-specific construct at preintervention; Obs Mean Post = the mean for the observer-specific construct at postintervention; PPI = Parenting Practices Interview; DPICS = Dyadic Parent–Child Interactive Coding System; CII = Coder Impression Inventory.

joint modeling of three different parenting assessments (two by observers and one by mothers) in each parenting domain (i.e., harsh/negative, supportive/positive, inconsistent/ineffective parenting). In doing so, SEMs allowed the specification of latent parenting constructs that (under certain assumptions) did not have any measurement error. Second, the SEMs allowed the flexibility to incorporate measurement models, program impacts, and covariate effects, all at once. Third, the SEMs provided the ability to test equality of program effects across different groups of program participants, such as those who had mental health risk factors and those who did not have mental health risk factors. Fourth, the SEMs allowed the inclusion in the statistical modeling, of the sample members who could not be assessed postprogram (referred to as the attrition group hereafter). This is especially advantageous for the assessment of the effectiveness of a voluntary intervention because parents who did not participate in the postprogram assessments may be selective of some characteristics that may deter program benefits.

The structure of the models is presented in Figure 1. The measurement model represents the series of three indicators of a given domain of parenting by two constructs. An overall parenting measure is indicated by all available measures including self-report and observer reports. In other words, the overall parenting measure is the description of parenting behaviors that are readily agreed on by the parent and the observer; it is the shared truth about parenting behaviors. In addition, an

observer-specific construct was specified, which represents the parenting behaviors noted by the two observer reports but not agreed on by the parent. The observer-specific construct quantifies the additional attributes of parenting behavior that would have remained unquantified if only the shared truth between the parent and the observer were considered. The overall parenting construct and the observer-specific construct are assumed unrelated, so that the observer-specific construct represents: (1) aspects of parenting that were situation specific, (2) aspects of parenting that were unreported by the parents because of biases in parent self-reports but noted by the observers, (3) aspects of parenting that were not captured by the self-reports of the parents because they may be unaware of specific behaviors that were considered pertinent by the observers, and (4) other factors that were shared across observer reports but not between self-reports and observer reports (e.g., the observer bias).

For all three parenting domains, representation of observer and parent self-report measures using a single construct yielded unacceptable deterioration of the goodness of fit of the basic program effectiveness model depicted in Figure 1 that included two constructs. The nested difference of chi-square tests were as follows: harsh/negative parenting, $\chi^2(8) = 550.2$, $p = <.001$; supportive/positive parenting, $\chi^2(8) = 252.1$, $p = <.001$; and inconsistent/ineffective parenting, $\chi^2(8) = 112.9$, $p = <.001$. Thus, the presence of two constructs we label as *overall* and *observer-specific* parenting was empirically supported.

The three domains of parenting were separately analyzed. This is not because of a methodological limitation but rather because of a practical and a conceptual consideration. When a single parenting domain is considered, three indicators of that domain were included in the model for pre- and post-program. This implied that six highly correlated indicators were structured as indicated in Figure 1. If additional indicators of other domains of parenting are included in the model, the estimation algorithms become unstable because of many highly correlated indicators. At the same time, conceptually, there was little reason to hypothesize that program impact would be identical across the three parenting domains. Therefore, combining the indicators of different domains of parenting in a single construct (e.g., a general parenting skill construct) was not considered. The analyses presented here were designed to reveal possible differential effectiveness of the intervention program on different domains of parenting and on parents with different risk factors.

The structural model that represented the change in parenting between pre- and post-intervention assessments had three important attributes. First, the multigroup modeling approach commonly used in SEM was adopted as described in Bollen (1989) and Arbuckle (1997). This approach allows the testing of equivalence of model parameters across multiple groups. In basic models, three groups were considered: the control group, the intervention group, and the attrition group. In other models, additional groups were considered, for example, participants who attended at least three training sessions and those who attended fewer sessions, or participants who had specific mental health risk factors and those who did not have any mental health risk factors (explained in detail later). The multigroup approach to modeling allows the specification of models that represent different levels of program effectiveness in groups defined by program attendance and risk status. Furthermore, goodness-of-fit of models that constrain model parameters to be equal across groups versus those that allow them to vary freely across groups can be compared and tested.

Second, the SEMs presented here included a model of the means and intercepts of the latent constructs (as well as observed parenting measures). The estimated means and intercepts assessed the following: (1) whether at the initial assessment the group of parents who participated in the intervention had parenting skills that were comparable to the control group; and (2) whether at the postintervention assessment, levels of parenting skills for intervention groups (with and without the risk factors) were significantly different from the control group. This latter estimate is critical in demonstrating the effectiveness of the parenting training program for various groups of participants. The estimated mean levels of postintervention parenting constructs presented here were adjusted means that accounted for the preintervention levels of the same constructs. Thus, these adjusted postintervention means are comparable across groups in multigroup analyses as described in Model III.

The basic model of pre- to post-intervention parenting constructs was enhanced in several ways. At the first step, indicators of program engagement for the intervention group that could affect the postintervention parenting construct were included (Model I, Figure 2). The latent program engagement construct was indicated by the three measures of program engagement listed earlier (attendance, participation, and homework). Model I assessed whether program engagement predicted improvements in parenting skills for all parents.
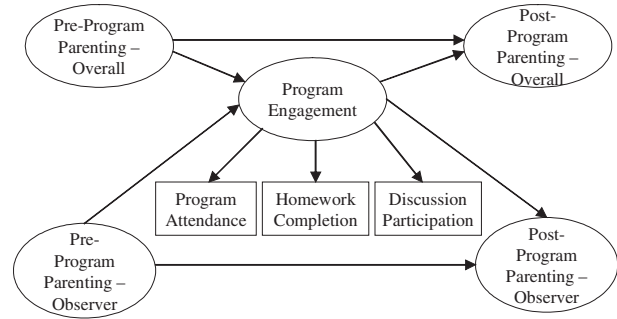

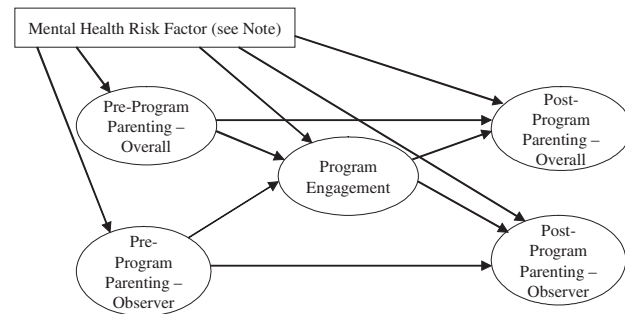Figure 2. Model structure for the program engagement models.

Figure 3. Model structure for the effects of mental health risk factors. All five mental health risk factors considered in this study (i.e., depressive symptoms, anger problems, having experienced harsh parenting, abusive parenting, and having a substance abuse history) were included in the model simultaneously. A single general indicator is displayed here to retain the clarity of the figure.

At the second step, measures of mental health risk factors were included in the model as covariates that might influence preprogram parenting skills, program engagement (for the intervention group only), and postprogram parenting skills (Model II, Figure 3). This structure represents a process in which several mental health risk factors may predict parenting skills as well as difficulties that high-risk parents may have attending or benefiting from a parenting training program. It was hypothesized that the effects of mental health risk factors on postprogram parenting skills would be insignificant once their effects on preprogram parenting skills were accounted for. In other words, the mental health risk factors were expected to be associated with initial level of parenting skills but not changes in them. Nevertheless, this hypothesis needed to be empirically tested. It was possible that some mental health risk factors could result in deficiencies in the initial level of parenting skills as well as lead to further deterioration of parenting skills. Thus, models of the effects of mental health risk factors

on parenting skills (Model II) tested the effects of these risk factors on both pre- and post-program parenting skills, in addition to their effects on program engagement.

At the third step, the basic model was extended to include additional groups defined by intervention and control status, intervention program attendance, and mental health risk status (Model III). For example, for an analysis of the effects of anger/aggression on program benefits, eight groups were considered simultaneously in a multigroup SEM: (1) control group, low anger; (2) control group, high anger; (3) low-anger intervention group who attended ≥3 sessions; (4) high-anger intervention group who attended at ≥3 sessions; (5) low-anger intervention group who attended ≤2 sessions; (6) high-anger intervention group who attended ≤2 sessions; (7) low-anger participants who were in the attrition group; and (8) high-anger participants who were in the attrition group. The structure of Model III is represented in Figure 1.

Analyses of multiple groups thus defined are akin to the testing of interaction effects of program effectiveness and preprogram mental health of the mothers. In other words, it was hypothesized that the intervention had varying degrees of effectiveness depending on whether the mothers had specific mental health risk factors. As in any empirical analyses including interaction effects, the interpretation of the main effects must be carefully considered. In this case, simple models that did not include groups defined by mental health risk indicators provided valuable information regarding the overall effectiveness of the intervention program when it was offered to all Head Start parents. Furthermore, although previous studies suggested that parenting programs might be less effective for parents with mental health risk factors than others, the parenting training program considered in this study was designed with the expectation that all Head Start parents, regardless of risk status, would benefit from it. Therefore, models of overall effectiveness of the intervention program were warranted.

Results

Parenting skill measures of the intervention and control groups at preintervention assessments are given in Table 2. At the time of the preintervention assessment there were slightly higher levels of harsh parenting (PPI and CII measures) and ineffective parenting (CII measure only), and slightly lower levels of supportive parenting in the intervention group than in the control group. These differences

Table 2
Mean Levels of Preintervention Parenting Skills

Parenting skill measure (all percentile scores)	Pre-intervention assessments	
	Control group (N = 275)	Intervention group (N = 607)
Harsh/negative parenting (PPI)	42.0*	46.0
Supportive/positive parenting (PPI)	72.2	72.1
Inconsistent parenting (PPI)	32.7	33.8
Harsh/negative parenting (CII)	16.2*	19.5
Supportive parenting (CII)	49.2	47.1
Ineffective parenting (CII)	12.2*	15.2
Harsh/negative parenting (DPICS – R)	13.0	14.7
Supportive parenting (DPICS – R)	18.7*	16.2
Ineffective parenting (DPICS – R)	11.8	12.7

Note. PPI = Parenting Practices Interview; DPICS-R = Dyadic Parent – Child Interactive Coding System – Revised; CII = Coder Impression Inventory.
*Significant difference of means of the intervention and control groups at $p < .05$, two-tailed t test.

were small, however, about 15% to 20% of a standard deviation. To obtain parsimonious representations of the basic multigroup model structure (Figure 1), several simplifying assumptions were tested to ensure that parsimonious models did not compromise the fit of the basic model to the data. Once a parsimonious structure was obtained, it was kept through various model modifications such as the inclusion of program engagement as a predictor of the postintervention parenting skills and the inclusion of mental health risk factors as predictors of the pre- and post-intervention parenting skills. For the models of all three domains of parenting, the model simplification assumptions were tested in three steps as described in the following discussion.

In Step 1, simplifications of the measurement submodels of the latent constructs were tested. The measurement submodels involved the loadings of the latent constructs on observed indicators of parenting for pre- and post-intervention assessments (paths a to j in Figure 1). The hypothesis that the loadings were equal across intervention, control, and attrition groups for preintervention assessments, and across intervention and control groups for postintervention assessments was supported for each parenting domain because the equality assumptions did not result in a significant deterioration of model fit: harsh/negative parenting, $\chi^2(7) = 1.2$, $p = .95$; supportive/positive parenting, $\chi^2(7) = 6.4$, $p = .49$; inconsistent/ineffective parent-

ing, $\chi^2(7) = 10.1$, $p = .18$. The measurement models for harsh/negative parenting and inconsistent/ineffective parenting could be further simplified without significantly affecting the model fit by equating the pre- and post-intervention loadings of the latent constructs on the indicators (a = f, b = g, e = j in Figure 1). The differences of chi-square tests for constrained and unconstrained models were as follows: harsh/negative parenting, $\chi^2(3) = 4.2$, $p = .24$; inconsistent/ineffective parenting, $\chi^2(3) = 1.8$, $p = .62$.

In Step 2, simplification of the representation of the mean levels of preintervention latent constructs was tested using the difference of chi-square statistics for constrained and unconstrained models. Where constraints imposing equality of means were not supported, separate means were estimated for preintervention latent constructs. For the model of harsh/negative parenting, the estimated preintervention means for the observer-specific constructs could be constrained to be equal across control, intervention, and attrition groups—parameter n in Figure 1, $\chi^2(2) = 1.9$, $p = .40$—but the preintervention means for the overall harsh/negative parenting construct were not equal across these groups, $\chi^2(2) = 9.0$, $p = .01$. The mean of the overall harsh/negative parenting construct was significantly higher for the intervention group than for control group at the preintervention assessment.

For the model of supportive/positive parenting, the estimated preintervention means for the overall constructs (parameter m in Figure 1) could be constrained to be equal across control, intervention, and attrition groups, $\chi^2(2) = 0.0$, $p = .99$, but the preintervention means for the observer-specific construct were not equal across these groups, $\chi^2(2) = 10.2$, $p = .01$. These findings were expected based on the data presented in Table 2.

For the model of inconsistent/ineffective parenting, the estimated preintervention means for both the overall (parameter m in Figure 1) and the observer-specific constructs (parameter n in Figure 1) could be constrained to be equal across control, intervention, and attrition groups, $\chi^2(2) = 2.2$, $p = .33$, and $\chi^2(2) = 3.3$, $p = .20$, respectively.

In Step 3, a parsimonious representation of the predictive link between pre- and post-intervention latent constructs was tested (paths k and l in Figure 1). For all three domains of parenting skills, the tests of equality of the predictive links between pre- and post-intervention overall and observer-specific constructs across intervention and control groups indicated nonsignificant deterioration of the fit of the model: harsh/negative parenting, $\chi^2(2) = $

4.2, $p = .13$; supportive/positive parenting, $\chi^2(2) = 2.7$, $p = .26$; inconsistent/ineffective parenting, $\chi^2(2) = 1.2$, $p = .55$. Therefore, the parsimonious models of the predictive links (paths k and l in Figure 1) were retained for all three parenting domains. This is analogous to the assumption of parallelism, often invoked when analyzing intervention data with analysis of covariance (ANCOVA). Empirical support for this assumption indicated that the intervention program might have enhanced the overall level of parenting skills; however, mothers who were relatively more skilled before the intervention (in overall as well as observer-specific constructs) were still relatively more skilled as compared with other mothers after the intervention. In other words, mothers' rankings vis-à-vis their parenting skills were not altered by the intervention program.

All SEMs presented here (Tables 3–6) retained the parsimonious model structure as described for each parenting domain. The goodness of fit of all of the models presented here was good, as indicated by the overall goodness-of-fit statistics provided (see the following). This constituted further evidence that the constraints imposed to achieve parsimonious models were supported by the data.

The purpose of the analyses presented here was to investigate whether a parenting training program is effective for parents who have elevated levels of mental health risk factors. However, a few questions must be addressed before the effectiveness of the parenting training for this high-risk group can be meaningfully evaluated. Specifically, one must demonstrate that (1) program attendance improves parenting skills (Model I), (2) high-risk parents attend the training program (Model II), and (3)

Table 3

Standardized Parameter Estimates of Model I for the Effects of Program Engagement on Postintervention Parenting Skills

Latent parenting constructs	Estimated effects for		
	Harsh/ negative parenting	Supportive/ positive parenting	Inconsistent/ ineffective parenting
Overall parenting construct	− .100*	.103*	− .269**
Observer-specific construct	− .277**	.169**	− .093*

Note. Estimates are based on the addition of program participation construct to the basic structure representing the intervention group as depicted in Figure 2.
*$p < .05$, one-tailed. **$p < .01$, one-tailed.

high-risk parents benefit from the program (Model III). The following subsections address these questions.

Effects of Program Engagement and Its Predictors—Model I (Figure 2)

It was hypothesized that program engagement would increase program benefits in a dose-response fashion. To model this process, a program engagement construct was included in the basic model. Because the control group did not receive parent training, a program engagement construct was included only in the model structure for the intervention group, in the multigroup SEM. The program engagement construct was indicated by attendance, homework compliance, and participation in discussions during training sessions. According to the model specification, the preintervention level of parenting skills (overall and observer-specific constructs) could influence program engagement. At the same time, both preintervention level of skill and program engagement could influence postintervention outcomes. The results of the three models specified in this way for harsh/negative, supportive/positive, and inconsistent/ineffective parenting constructs were presented in Table 3. All three models fit the data well: harsh/negative parenting model, $\chi^2(35) = 43.2$, $p = .16$, root mean square error of approximation (RMSEA) = .016, comparative fit index (CFI) = .99; supportive/posi-

tive parenting model, $\chi^2(30) = 38.4$, $p = .14$, RMSEA = .018, CFI = .99; inconsistent/ineffective parenting model, $\chi^2(37) = 43.6$, $p = .21$, RMSEA = .014, CFI = .99.

Program engagement significantly reduced harsh/negative parenting, significantly increased supportive/positive parenting, and significantly reduced inconsistent/ineffective parenting. These effects were significant both on overall parenting constructs and on observer-specific constructs. The results for the overall parenting constructs indicated that 1 SD of increase in program engagement reduced harsh/negative parenting and increased supportive/positive parenting by about 10% of a standard deviation unit. A similar increase in program participation diminished inconsistent/ineffective parenting by one fourth of a standard deviation unit. Further improvements on parenting skills were detected when observer-specific constructs were considered.

Effects of Preintervention Parenting Skills on Program Engagement—Model I (Figure 2)

The results shown in Table 4, top panel, indicate that mothers who had higher levels of harsh/negative and inconsistent/ineffective parenting at baseline showed higher levels of program engagement. At the same time, mothers who had high levels of supportive/positive parenting also showed high levels of program engagement. These positive effects were found for the overall parenting con-

Table 4

Standardized Effect Estimates of Preintervention Characteristics of Mothers on Program Engagement

Latent parenting constructs	Estimated effects in the model for		
	Harsh/negative parenting	Supportive/positive parenting	Inconsistent/ineffective parenting
Effects of preintervention parenting skills on program engagement (results from Model I)[a]			
Overall parenting construct	.312**	.164**	.150*
Observer-specific construct	− .042	− .001	.087
Effects of mental health risk factors on program engagement (results from Model II)[b]			
Depressive symptoms (CES–D)	− .087*	− .065	− .074
Anger (BAAQ)	− .051	.049	− .014
Experience of harsh parenting	.022	− .014	.011
Experience of abusive parenting	− .009	.033	.037
Parent had a history of substance abuse	.048	.086*	.103*

Note. CES–D = Center for Epidemiological Studies Depression Scale; BAAQ = Brief Anger-Aggression Questionnaire.
[a]Estimates are based on the addition of program participation construct to the basic structure representing the intervention group as depicted in Figure 2.
[b]Estimates are based on the addition of the mental health indicators to the model that included the program participation construct as depicted in Figure 3. *$p < .05$, one-tailed.**$p < .01$, one-tailed.

structs, indicating that parenting skills before the intervention as assessed by both parents and observers predicted program engagement. Harsh/negative parenting was a stronger predictor of program engagement than supportive/positive or inconsistent/ineffective parenting. The strength of the effect of preintervention harsh/negative parenting on program engagement (30% of a standard deviation unit) was twice the size of the comparable effects of supportive and inconsistent parenting constructs (15% of a standard deviation unit). These results indicated that despite poor parenting skills, mothers who were harsh or negative toward their children were interested in and motivated to improve their skills through parenting training.

Effects of Mental Health Risk Factors on Program Engagement—Model II (Figure 3)

The models of parenting skills in three domains were modified to include mental health risk factors that predicted parenting skills at preintervention as well as program engagement. Five mental health risk factors were considered: CES–D, BAAQ, experience of harsh and abusive parenting in the past, and having a history of substance abuse. The results of these analyses were presented in Tables 4 and 5. Again, results from three multigroup SEMs were presented, one for each parenting domain. All three models fit the data well: harsh/negative parenting model, $\chi^2(106) = 128.9$, $p = .07$, RMSEA = .015, CFI = .99; supportive/positive parenting model, $\chi^2(113) = 132.6$, $p = .10$, RMSEA = .014,

CFI = .99; inconsistent/ineffective parenting model, $\chi^2(118) = 131.9$, $p = .18$, RMSEA = .012, CFI = .99.

Mental health risk factors had limited influences on program engagement (second panel of Table 4). The only negative influence was that of the CES–D scores. When the effects of harsh/negative parenting on program engagement were accounted for (as depicted in Figure 3), depressive affect predicted a small additional reduction in program engagement. Mothers who had a history of substance abuse had higher levels of program engagement than other mothers with similar levels of positive parenting and inconsistent parenting. The multitude of nonsignificant effect estimates and the absence of negative significant effects (except for one) in the second panel of Table 4 indicated that mothers with mental health risk factors did become engaged in parenting training as much as the mothers who did not have those mental health risk factors.

Effects of Mental Health Risk Factors on Parenting Skills—Model II (Figure 3)

As expected, some maternal mental health risk factors were associated with higher levels of maladaptive parenting (Table 5). Anger problems (BAAQ) and depressive affect (CES–D) predicted increased harsh/negative and inconsistent/ineffective parenting, as assessed by the overall parenting constructs at the baseline. Anger problems, but not depressive affect, also reduced the level of supportive/positive parenting. Mothers' experience of abusive parenting predicted significantly higher

Table 5

Standardized Parameter Estimates of Model II for the Effects of Mental Health Indicators on Preintervention Parenting Constructs

Mental health indicator	Harsh/negative parenting	Supportive/positive parenting	Inconsistent/ineffective parenting
Effects of mental health risk factors on overall parenting constructs			
Depressive symptoms (CES–D)	.101**	.021	.169**
Anger (BAAQ)	.212**	− .102**	.176**
Experience of harsh parenting	− .055	.061	.052
Experience of abusive parenting	.161**	.148**	− .085
Parent had a history of substance abuse	.172**	.104**	.066
Effects of mental health risk factors on observer-specific parenting constructs			
Depressive symptoms (CES–D)	− .008	− .073*	− .037
Anger (BAAQ)	.126**	.008	.129*
Experience of harsh parenting	.013	.013	− .093
Experience of abusive parenting	.010	− .015	.057
Parent had a history of substance abuse	− .018	.112**	.040

Note. CES–D = Center for Epidemiological Studies Depression Scale; BAAQ = Brief Anger–Aggression Questionnaire.
*$p < .05$, one-tailed. **$p < .01$, one-tailed.

levels of harsh/negative parenting before the training program. A history of substance abuse was also positively associated with harsh/negative parenting. It is interesting that mothers who reported a history of abuse or substance abuse were also significantly more supportive/positive than mothers who did not report these risk factors. The only risk factor that did not influence baseline parenting skills in any domain was the mothers' history of being harshly parented. There were weaker effects of mental health risk factors on the observer-specific parenting constructs (Table 5, bottom panel) than the overall parenting constructs (Table 5, top panel).

Effects of all of the mental health risk factors on postintervention parenting skills were also estimated. However, when their effects on preintervention parenting skills were accounted for, their effects on postintervention parenting skills were not significant, with two exceptions. Tests of whether the effects of mental health indicators on postintervention overall and observer-specific harsh/negative parenting constructs were zero indicated support for this hypothesis, except for the BAAQ. Nested goodness-of-fit tests of models equating these effects to zero were as follows: CES–D, $\chi^2(4) = 6.2$, $p = .19$; BAAQ, $\chi^2(4) = 13.4$, $p = .01$; experience of harsh parenting, $\chi^2(4) = 2.3$, $p = .68$; experience of abusive parenting, $\chi^2(4) = 1.5$, $p = .83$; history of substance abuse, $\chi^2(4) = 8.6$, $p = .07$. Tests of whether the effects of mental health indicators on supportive/positive parenting constructs were zero indicated full support for this hypothesis: CES–D, $\chi^2(4) = 1.9$, $p = .75$; BAAQ, $\chi^2(4) = 0.8$, $p = .94$; experience of harsh parenting, $\chi^2(4) = 6.4$, $p = .17$; experience of abusive parenting, $\chi^2(4) = 5.6$, $p = .24$; history of substance abuse, $\chi^2(4) = 4.8$, $p = .31$. Tests of whether the effects of mental health indicators on inconsistent/ineffective parenting constructs were zero indicated support for this hypothesis, except for the experience of harsh parenting: CES–D, $\chi^2(4) = 7.3$, $p = .12$; BAAQ, $\chi^2(4) = 4.4$, $p = .36$; experience of harsh parenting, $\chi^2(4) = 11.4$, $p = .02$; experience of abusive parenting, $\chi^2(4) = 0.8$, $p = .94$; history of substance abuse, $\chi^2(4) = 8.0$, $p = .09$. These findings indicated that mental health risk factors predicted initial levels of parenting skills, but with two exceptions, they did not predict continued deterioration of parenting skills.

Effectiveness of Parenting Training for Mothers With Mental Health Risk Factors—Model III (Figure 1)

The effectiveness of parenting training programs for mothers with mental health risk factors were estimated by multigroup SEMs that considered groups of mothers defined by the presence of risk factors and having attended at least three sessions of the parenting training program (attenders), as described earlier. The results in Table 6 indicate the difference in the relative mean level of overall and observer-specific parenting constructs, as compared with the mean level estimated for the control group mothers (for a technical discussion of this model, see Arbuckle, 1997, pp. 475–492). As such, these estimates could be interpreted as indicators of the effectiveness of the intervention program. Because the scales of the effect estimates are relative to the control group, the sizes of the effects may be difficult to interpret. Because standardized intercept estimates could not be estimated, the estimated intercepts were also expressed as a percentage of the estimated standard deviation of the preintervention latent parenting constructs of the intervention group to facilitate the interpretation of the effect sizes. These percentage effect sizes are also included in Table 6. All effects are presented separately for the overall parenting construct and the observer-specific parenting construct in each of the three domains of parenting. As indicated before, the overall parenting construct quantifies the shared opinions of the parents and observers regarding the quality of parenting in each domain. The observer-specific construct quantifies the aspects of observer evaluations that were not shared by the parents.

In the top panel of Table 6, two aggregate models were presented that did not consider the presence of mental health risk factors. The remaining three panels provide the results of the models that considered depressive affect, anger problems, and having experienced abusive parenting as mental health risk factors. Two risk factors were eliminated from consideration: History of harsh parenting was not considered because it had no effects on initial levels of parenting skills or on program engagement. Substance abuse history was not considered because its effects on program engagement were significant and positive. Thus, there was no concern that mothers who admitted a history of substance abuse could not benefit from the intervention program.

The top row of Table 6 indicates the effectiveness of the parenting training program for all participants who were in the intervention group, regardless of the number of sessions attended. These models fit the data satisfactorily for all three parenting domains: harsh/negative parenting model, $\chi^2(22) = 19.6$, $p = .61$, RMSEA = .000, CFI = 1.00; supportive/positive parenting model, $\chi^2(19) = 20.3$,

Table 6

Results of Model III Regarding the Effectiveness of the Intervention Program in Mental Health Risk Groups

	Estimated intercept (relative to the control group that did not have any mental health risk factors)					
	Harsh/negative parenting		Supportive/ positive parenting		Inconsistent/ineffective parenting	
	Overall parenting construct	Observer-specific parenting construct	Overall parenting construct	Observer-specific parenting construct	Overall parenting construct	Observer-specific parenting construct
All participants (N = 482)	−1.278**	−0.269**	-0.264	0.283**	−0.028	−2.850**
	36.9%	27.5%	4.4%	35.9%	9.6%	46.2%
All mothers who attended the	−1.658**	−0.423**	0.133	0.360**	−0.140*	−3.156**
program for at least 3 sessions (N = 344)	48.6%	41.4%	2.3%	47.7%	47.1%	49.9%
	Depressive symptoms					
Mothers who had:						
High depressive symptoms and	−1.483*	−0.334**	0.736	0.324**	−0.214*	−3.393**
attended the program for at	49.4%	33.9%	13.2%	37.9%	80.8%	43.9%
least 3 sessions (N = 139)						
Low depressive symptoms and	−1.312**	−0.509**	0.318	0.441**	−0.136*	−3.622**
attended the program for at	41.1%	48.0%	5.4%	63.3%	50.4%	82.7%
least 3 sessions (N = 205)						
High depressive symptoms and	0.240	−0.037	1.286	0.070	−0.100	−0.998
were in the control group (N = 68)	7.0%	4.1%	28.1%	9.3%	32.6%	18.4%
	Anger					
Mothers who had:						
High anger and attended	−2.191*	−0.380**	0.025	0.378**	−0.193	−2.328*
the program for at least 3	90.0%	36.5%	0.3%	55.0%	119.3%	32.5%
sessions (N = 115)						
Low anger and	−1.370**	−0.541**	−0.187	0.366**	−0.113*	−3.583**
attended the program for at	45.7%	51.7%	3.2%	47.6%	39.9%	119.4%
least 3 sessions (N = 229)						
High anger and were in	−0.827	−0.228*	−0.208	0.019	−0.132	−0.257
the control group (N = 51)	30.5%	25.8%	4.2%	3.1%	48.9%	4.8%
	Experience of abusive parenting					
Mothers who had						
Experience of abusive parenting	−1.466**	−0.353**	1.030	0.370**	−0.209*	−1.222
and attended the program for	43.9%	35.0%	19.0%	45.8%	77.4%	18.9%
at least 3 sessions (N = 119)						
No experience of abusive parenting and	−2.110**	−0.383**	0.213	0.376**	−0.110*	−3.473**
attended the program for at least	65.9%	35.8%	4.4%	50.8%	44.2%	58.2%
3 sessions (N = 225)						
Experience of abusive parenting	−1.103+	0.203*	0.583	0.067	−0.018	1.166
and were in the control group (N = 73)	32.7%	24.0%	18.8%	8.0%	8.2%	18.5%

Notes. Percentages express the estimated adjusted intercept as a percentage of the estimated standard deviation of the corresponding latent parenting construct at preintervention.

*p < .05, one-tailed. **p < .01, one-tailed.

$p = .38$, RMSEA = .010, CFI = 1.00; inconsistent/ineffective parenting model, $\chi^2(24) = 29.1$, $p = .22$, RMSEA = .016, CFI = 1.00. Harsh/negative parenting diminished significantly for intervention-group mothers as compared with the control-group mothers. In addition, observers detected an additional decline in negative parenting that was not captured by the overall construct. These improvements in harsh/negative parenting were substantial, about 37% of a standard deviation of the overall parenting construct and 28% of standard deviation of the observer-specific parenting construct. Program effects on supportive/positive parenting and inconsistent/ineffective parenting were detected by observers only; mothers themselves did not share the evaluation that their parenting skills had improved in these areas. Nevertheless, observers detected substantial increases in supportive/positive parenting (36% of standard deviation) and substantial declines in inconsistent/ineffective parenting (46% of standard deviation).

The second row of Table 6 lists the estimated intercepts for the sample of experimental group attenders. The multigroup SEM considered two groups of experimental group participants (attenders and nonattenders) in addition to the control and attrition group participants. The fit was satisfactory for the models of all three parenting domains: harsh/negative parenting model, $\chi^2(36) = 42.2$, $p = .22$, RMSEA = .014, CFI = .99; supportive/positive parenting model, $\chi^2(33) = 43.9$, $p = .10$, RMSEA = .019, CFI = .99; inconsistent/ineffective parenting model, $\chi^2(36) = 43.4$, $p = .19$, RMSEA = .015, CFI = .99. All intervention effects were larger for the group of attenders. Most of the estimated effects of program impact increased by 35% to 50% for the attenders as compared with the estimates for all intervention-group mothers (Table 6). Mothers and observers agreed that the maladaptive parenting behaviors represented by the harsh/negative and inconsistent/ineffective parenting constructs declined by almost half a standard deviation, which is a substantial effect size for a preventive program. Observers detected an additional 40% to 50% of a standard deviation of improvement in parenting skills in all three domains.

The next three panels of Table 6 reveal the effectiveness of the intervention program for mothers in three groups: (1) attenders who had a specific mental health risk factor, (2) attenders who did not have that mental health risk factor, and (3) attenders who had that mental health risk factor and were in the control group. As before, these results are obtained from multigroup SEMs that considered

eight groups as described earlier. All estimated levels of parenting skills were presented relative to the control-group mothers who did not have the mental health risk factor of interest. Estimated relative levels were presented as well as their magnitudes as a percentage of the estimated standard deviation of the latent preintervention constructs. The fit statistics of these multigroup SEMs indicated satisfactory fit to the data. The overall fit statistics are presented in Table 7.

Attenders who had a high level of depressive affect displayed changes in all three parenting constructs in the expected directions, which were comparable in magnitude to the mothers who had a low level of depressive affect (second panel of Table 6). The program effects estimated based on the observer-specific construct indicated stronger effects for the parents with low levels of depression than for the parents with high levels of depression. Control-group mothers who had a high level of depression did not show a significant change in parenting skills in any one of the three parenting domains investigated here.

Program benefits for attenders with anger problems were similar to the attenders without anger problems (third panel of Table 6). Furthermore, intervention mothers who had high anger problems benefited more than those without anger problems

Table 7

The Overall Goodness-of-Fit Statistics for the Multigroup SEMs of the Effectiveness of the Intervention Program in Mental Health Risk Groups

Model considering the mental health indicator	Harsh/ negative parenting	Supportive/ positive parenting	Inconsistent/ ineffective parenting
Depressive symptoms (CES-D)			
Chi-square, *df*, *p*	79.9, 75, .33	73.0, 71, .41	77.7, 80, .55
RMSEA	.009	.006	.000
CFI	.99	1.00	1.00
Anger (BAAQ)			
Chi-square, *df*, *p*	75.5, 75, .46	91.7, 64, .01	84.0, 80, .36
RMSEA	.003	.022	.008
CFI	.99	.99	.99
Experience of abusive parenting			
Chi-square, *df*, *p*	83.7, 78, .31	69.4, 71, .53	118.7, 80, .00
RMSEA	.009	.005	.024
CFI	.99	1.00	.99

Note. SEM = − structural equation model; CES−D = Center for Epidemiological Studies Depression Scale; BAAQ = Brief Anger−Aggression Questionnaire; RMSEA = root mean square error of approximation; CFI = comparative fit index.

in harsh/negative parenting. The effect sizes for these two groups of mothers on the overall harsh/negative parenting construct were 90% and 46% of a standard deviation, respectively. Intervention mothers without anger problems benefited more from the parenting training in inconsistent/ineffective parenting than those who had anger problems (effects of 33% and 119% of a standard deviation, respectively). The parenting skills of control-group parents with high levels of anger problems did not change between pre- and post-intervention assessments.

Mothers who had a childhood history of abuse benefited from the parenting training program compared with control-group mothers without that history, but not as much as intervention mothers who did not have such a history (last panel of Table 6). Intervention mothers with a history of childhood abuse decreased their harsh/negative parenting by 44% of a standard deviation as compared with control-group parents who did not have this risk factor. However, the intervention mothers with no history of childhood abuse showed a decline of 66% of a standard deviation. Declines in harsh/negative parenting assessed by the observer-specific construct were comparable between abused and nonabused mothers. Similarly, the gain in supportive/positive parenting detected by the observers was comparable for the mothers who experienced abuse as children and those who had not. On the inconsistent/ineffective parenting construct, mothers who were abused as children showed comparable beneficial intervention effects on both the overall and the observer-specific constructs. In contrast, mothers with no history of childhood abuse did not share the observers' evaluation that there was a decline in their inconsistent/ineffective parenting.

In summary, the analyses presented here suggests that mental health risk factors influenced baseline parenting skills negatively, but they did not deter mothers from participating in a parent training offered to strengthen parenting skills. Mothers with high levels of these risk factors benefited from this training just as much (and sometimes more) than mothers who did not have mental health risk factors.

Discussion

This research addressed the malleability of parenting skills in a sample of socioeconomically disadvantaged mothers of preschool children. It is known that low-income mothers face a number of life stressors that may threaten their mental health and well-being as well as disrupt their parenting (Webster-Stratton, 1990). Indeed, in this study 35% of the families had three or more major risk factors (e.g., single parenthood, depressive symptoms, psychiatric illness, history of drug abuse, child abuse, spouse abuse, etc.) and 40% to 45% of the mothers displayed high rates of harsh or negative discipline. These risk factors have been associated with the development of children's conduct problems (Webster-Stratton & Hammond, 1998) as well as with poor treatment response and treatment dropout in some treatment samples (Dumas & Wahler, 1983; Kazdin & Mazurick, 1994; Kazdin & Wassell, 1999; Webster-Stratton, 1985b). However, little is known about the effects of these risk factors on the effectiveness of preventive parenting programs offered to nonreferred parents whose children have not been diagnosed with conduct problems or who have not sought treatment. Moreover, little is understood about how these risk factors will affect a parent's level of engagement or determine a parent's ability to benefit from the program. In this study, data from a parenting prevention program offered to Head Start parents were analyzed to address the following research questions: (1) Does engagement in a parenting program predict enhanced parenting skills in a dose-response fashion? (2) Do mothers with mental health problems become as engaged in the parenting training program as mothers without these risk factors? (3) Do mothers with mental health risk factors benefit from the parenting training program compared with mothers with mental health risk factors in the control condition?

Analyses indicated that program engagement (defined by attendance, completion of homework, and involvement in discussions) was associated with program benefits in a dose-response fashion. Parents who were more engaged (i.e., attended more sessions, did homework, and participated in discussions) improved their parenting skills more than the parents who were less engaged. Furthermore, although program benefits could be seen after just three training sessions, mothers' positive parenting changes continued to increase with subsequent sessions. Note that mothers who attended three sessions on average attended more than seven sessions. Thus, attendance in three sessions may be an indicator of continued attendance. A caveat of these conclusions regarding the effects of program engagement is that this variable (i.e., engagement) is itself an outcome of parental choice. This study did not randomize mothers into experimental conditions with varying exposure to the program. Therefore, the effects of program engagement probably reflect,

to some extent, characteristics of the mothers. This is indeed confirmed by the analyses estimating the effects of preprogram characteristics on program engagement.

Some prior studies (Coie et al., 1993) voiced some pessimism that parents who might need parenting training most might also be the ones who would be least likely to be motivated, engaged, or involved in parenting intervention programs. The results of the present research contradict this opinion by indicating a high participation rate with a socioeconomically disadvantaged population. Moreover, mothers with higher levels of harsh/negative parenting and inconsistent/ineffective parenting were actually more engaged in our parenting intervention program. Furthermore, shared aspects of observers' and mothers' self-ratings of harsh and ineffective parenting predicted higher levels of program engagement. At the same time, mothers who were more supportive/positive were also more likely to be engaged in the training program. These data confirm prior research with the Linking Families Together (LIFT) parenting program for elementary children, which found that the highest risk (defined as harsh parenting) and lowest risk parents (defined as positive parenting style) were the most engaged in their school-based parenting program (Reid, Eddy, Fetrow, & Stoolmiller, 1999). More important, in this study mothers with mental health risk factors were as engaged as, and in some cases even more engaged than, mothers without these risk factors in the parenting program. For example, there was indication that mothers who had reported substance abuse problems were more engaged in the parenting training program than other mothers. Depression was the only risk factor that had a very small negative effect on program engagement. Because all mother risk factors were self-report variables, it is important to consider that there may be some self-selection in our sample of high-risk mothers. A willingness to report experience of substance abuse, for example, may have indicated a self-awareness and willingness to change not found in mothers who did not disclose this information.

As expected from prior research findings, mothers with mental health risk factors had poorer parenting skills before the start of the intervention than the mothers who did not have these risk factors. Depressive affect, anger problems, substance abuse history, and a childhood history of abusive parenting predicted harsher and less supportive baseline parenting skills. The only risk factor that did not influence parenting skills was the mothers' experience of harsh parenting as a child. These data

suggested that parents must have experienced harsh parenting at an extremely abusive level when they were children for it to influence parenting provided to the next generation. It is surprising that mothers who acknowledged experiencing abusive parenting and those who admitted a history of substance abuse showed a higher level of supportive/positive as well as harsh/negative parenting. These findings point to an inconsistency in the emotional tone of the mother–child relationships in these families. Perhaps these disclosures indicate a self-awareness and mothers who are attempting to compensate their parenting difficulties by accentuating their positive responses.

The effects of mental health risk factors on parenting skills before the intervention were mostly detected in the overall parenting construct. This overall parenting construct represented the aspect of parenting that both the observers and the parents agreed on (i.e., shared truth). There were a few additional effects of anger problems on parenting skills as reported by the observers but not by mothers (i.e., observer truth). Observers detected an excess of harsh and inconsistent parenting that was not shared by the self-reports for the mothers who had anger problems. Thus, one may cautiously conclude that mothers who have mental health problems are aware of their parenting problems and are accurately reporting those problems for the most part, with the exception, to a limited degree, of mothers with anger problems. This is an important finding because it suggests that a lower cost self-report method of evaluating parenting skills and difficulties correlate well with the higher cost observational methods even when parents have mental health problems that negatively influence their parenting skills. This has possible implications for a low-cost screening tool to be used by family service workers with mothers in Head Start to help identify those with risky parenting behaviors.

The parenting training program was effective for mothers with all of the measured mental health risk factors in all three domains of parenting skills (supportive, harsh, and inconsistent). It is interesting to compare the results obtained for the overall parenting construct (shared truth) with those obtained for the observer-specific construct (observer truth). Both the mothers and the observers indicated reductions in harsh/negative parenting, although observers detected more reductions. Mothers, on the other hand, did not share the observers' reports that their supportive/positive parenting was enhanced and their inconsistent/ineffective parenting was

reduced. An exception to this pattern was that mothers who reported they were abused when they were children also reported reductions in their inconsistent/ineffective parenting, similar to the observers' reports. Similar to the interpretation of the findings on substance abuse, it might be postulated that mothers who willingly disclose childhood abuse are observant of their own disciplinary approaches in an effort to avoid replicating their own parents' behaviors. In other words, mothers who are more aware of their abuse history may be less negative toward their own children and more willing to acknowledge that they may need help to avoid the intergenerational cycle of abuse. It appears that mothers were more sensitive in evaluating reductions in their harsh/negative parenting than parenting skills in other domains. Although this may be partly due to program content emphasizing the importance of not using harsh discipline, it may also be due to the nature of the skills that were being evaluated. For example, physical punishment or use of harsh words may be more easily and clearly defined than setting clear behavioral limits for the child or being supportive of prosocial behaviors. These findings indicate the importance of having observational data on a broad range of parenting behaviors when evaluating interventions.

In summary, these results strongly support the value of preventive parenting programs for use with high-risk parents. In this sample of low-income Head Start mothers, program engagement was high, and all mothers benefited from the program by increasing their supportive/positive parenting and decreasing their negative and inconsistent parenting. In this study, analyses indicated that parents who were most at risk for negative parenting because of mental health risk factors such as high levels of depressive symptoms, anger problems, substance abuse, or experience of childhood abuse, not only were engaged in and benefited from the program, but in some cases benefited more than parents without these risk factors. Among the high-risk mothers who were attenders the overall construct (including observations and parent report) showed 40% to 90% of a standard deviation of decline in harsh/negative parenting and 75% to 120% of a standard deviation of decline in inconsistent/ineffective parenting. Observers detected an additional 30% to 35% of a standard deviation of decline in harsh/negative parenting, 35% to 55% of a standard deviation of increase in supportive/positive parenting, and 20% to 40% of a standard deviation of decline in inconsistent/ineffective parenting. These

results point to moderate to substantial effects of the intervention for high-risk parents who attended the program.

From a policy point of view, these findings suggest that identifying and offering a parenting program to mothers with the mental health factors measured here could be an effective way to alter harmful parenting practices. However, the good news is that when this program is offered to all parents in a nonstigmatizing fashion, these are the very parents who take advantage of such programs. Thus, screening for these problems may not be necessary if the resources are available to offer the program to larger groups of parents. Indeed, we postulate that the inclusion of these non-high-risk parents in heterogeneous groups actually enhances the effectiveness of the program for the high-risk parents by providing positive parenting models. Although there were slightly attenuated estimates of program effectiveness for parents with elevated levels of depressive symptoms and parents with a history of abuse, these differences were small. More important, even mothers with depressive symptoms and a history of childhood abuse significantly and substantially benefited from the preventive parenting training program. These findings are contrary to popular beliefs that parents who are low income or who have mental health problems will not become engaged or benefit from intervention. It is important to note that the delivery of the program, which was offered in the Head Start centers and included child care, dinner, and transportation, helped remove many of the logistical barriers to attendance that disadvantaged parents often experience (Webster-Stratton, 1998a). In this supportive context, however, these results provide strong evidence for the acceptability and efficacy of this parenting prevention program for use as a school-based prevention program with high-risk, multiethnic, and socioeconomically disadvantaged parents.

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