Journal of Consulting and Clinical Psychology
2003, Vol. 71, No. 2, 261–278

0022-006X/03/$12.00 DOI: 10.1037/0022-006X.71.2.261

Parent Training of Toddlers in Day Care in Low-Income Urban Communities

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The authors tested a 12-week parent training program with parents ($n = 208$) and teachers ($n = 77$) of 2–3-year-olds in day care centers serving low-income families of color in Chicago. Eleven centers were randomly assigned to 1 of 4 conditions: (a) parent and teacher training (PT + TT), (b) parent training (PT), (c) teacher training (TT), and (d) waiting list control (C). After controlling for parent stress, PT and PT + TT parents reported higher self-efficacy and less coercive discipline and were observed to have more positive behaviors than C and TT parents. Among toddlers in high-risk behavior problem groups, toddlers in the experimental conditions showed greater improvement than controls. Most effects were retained 1 year later. Benefits were greatest when parents directly received training.

There is substantial evidence that improving parenting skills through parent training programs can significantly reduce the development and persistence of conduct problems and improve the quality of parent–child relationships (Kazdin, 1997; McMahon, 1999; Serketich & Dumas, 1996; Tucker & Gross, 1997). Specifically, when parents limit their use of coercive child management strategies (e.g., yelling, hitting, and verbal aggression) and increase their use of positive, supportive responses (e.g., encouragement, praise, and physically positive behaviors), child conduct problems and parenting self-efficacy significantly improve. These positive outcomes have mostly been achieved with early school-aged children and adolescents. However, those findings have led to increasing interest in providing training for parents when their children are toddlers and preschoolers, before child conduct problems become firmly entrenched and more difficult to treat (Wakschlag & Keenan, 2001; Yoshikawa, 1994).

Conduct problems affect approximately 7%–35% of preschoolers, with the higher rates occurring among children from low-income communities (Gross, Sambrook, & Fogg, 1999; Richman, Stevenson, & Graham, 1982; Webster-Stratton & Hammond, 1998). Persistent conduct problems originating during the preschool years are particularly disconcerting because children with "early onset" problems are among the most resistant to mental health treatment when treatment is delayed until later childhood (Dodge, Bates, & Pettit, 1999; Loeber, 1991). Unfortunately, few preschool children with conduct problems ever receive treatment, and even fewer of those ever receive a treatment that has empirical validation (Brestan & Eyberg, 1998).

Over 4,000,000 preschool children in the United States are enrolled in licensed child care facilities (Children's Defense Fund, 1998). Thus, day care offers the potential of providing one of the most efficient and effective strategies for delivering parent training programs to large numbers of families before child conduct problems develop into more serious problems. Within the context of day care, there are several ways parent training might be delivered. First, parent training may be offered on site directly to parents through weekly groups led by trained group leaders. A second option is to offer the same parent training program to parents and day care teachers. In this way, teachers can understand the behavior management strategies the parents are learning, model these behaviors in the classroom, and support the parents' learning in situ. Such cross-setting consistency and support in child management strategies could strengthen children's competencies and reduce behavior problems. A third option is to train only the day care teachers but not the parents. Teachers would then be instructed to use the behavior management strategies in their classrooms and teach the parents what they were learning. This strategy is important to study given that many low-income parents are unable to

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This study was supported by Grant R01 NRO4085 from the National Institute for Nursing Research and Grant K02 MH00988 from the National Institute for Mental Health. We gratefully acknowledge David Henry and Gina Barclay-McLaughlin for their consultation; Andrea Sambrook, Tamika Lee, Patricia Sistrunk, Irma Ordaz, Sol Maria Polo, Helga Mayrgrundter, Clariza Dominici, Betsy Lawson, Tonya Purnell, Martha Gonzalez, and Wytress Richardson for assistance with data collection; Ada Gonzalez, Mary Johnson, Alice Gutierrez, Barbara Julion, Lenora Pizzello, Christine Herrmann, Nadine Wengroff, Jane Deuster, Karyn Wesley, Virginia Julion, and Josie Murray for conducting parent and teacher training groups; and Kathy Rogers, Sarah Cook, Susan Reanier, Nat Houtz, Doris Harkness, and Kate Calhoun for assistance with coding videotapes.

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commit to weekly parent programs because of work and family constraints, and teacher training might be the best alternative for reaching this population of parents and children. In this study, we systematically evaluated the effectiveness of each of these options for delivering parent training in day care centers on parent and child outcomes.

Recently, Webster-Stratton and colleagues (Webster-Stratton, 1998; Webster-Stratton, Reid, & Hammond, 2001) demonstrated in two randomized control group prevention studies that the 8–9-week parent-training program (Incredible Years BASIC program) offered to an ethnically diverse sample of families of 4- and 5-year-olds enrolled in Head Start produces significant increases in positive and nonpunitive parenting skills and reduces children's conduct problems. Cultural sensitivity and accommodation to individual differences is fostered in this program by using a collaborative model in which parents identify their own goals for their children and group leaders help parents use the program principles for reaching their individual goals. In contrast to programs that use didactic presentations, the Incredible Years BASIC program centers on interactive learning and self-management. This collaborative model is consistent with formats used in other prevention programs with ethnically diverse families that have been shown to be effective (Dent, Sussman, Ellickson, Brown, & Richardson, 1996; Szapocznik et al., 1989). More specific details about the Incredible Years BASIC program are provided in the Method section.

Results of the first study with 364 families (Webster-Stratton et al., 2001) showed that at immediate postintervention, parents enrolled in the experimental centers used fewer coercive interaction strategies (i.e., fewer critical statements, commands, and coercive discipline strategies) and more positive interaction strategies with their children (i.e., more positive affect, praise, and physical positive behaviors) than parents in control centers. In addition, teachers in the experimental condition reported that the children were more socially competent than did teachers of children in the control condition. At the 1-year follow-up, most initial improvements were maintained.

The second study ($N = 272$; Webster-Stratton et al., 2001) added a 6-day Head Start teacher-training program in classroom management skills while parents participated in parent training (which was expanded to include 12 sessions in the Head Start year and 4 sessions in kindergarten). Results of this study indicated that parent–teacher bonding was significantly higher for mothers in the experimental condition compared with mothers in the control condition. In addition, independent observations indicated that children in the experimental condition showed significantly fewer conduct problems at school than children in the control condition. These findings demonstrated that the Incredible Years parent and teacher programs were effective in improving parenting skills and reducing conduct problems in a community sample of low-income parents of children 4–5 years old.

Toddlerhood has been identified as a critical period when 2- and 3-year-old children struggle for independence and control yet lack the maturity to function autonomously and effectively regulate many of their emotions. Their frustration often leads to temper tantrums, defiance, and aggression, behaviors that are viewed as developmentally appropriate but which many parents may lack the skills to manage without relying on harsh and coercive discipline strategies (Crockenberg & Litman, 1990; Kuczynski, Kochanska, Radke-Yarrow, & Girnius-Brown, 1987). Young children's efforts at self-regulation are further influenced by their experiences in day care, particularly for toddlers from low-income families, who are significantly more likely to receive poorer quality child care and experience frequent changes in their caregivers (Phillips & Adams, 2001).

In a randomized study of 56 married, middle-income European American parents of "difficult" 2-year-olds (Gross, Fogg, & Tucker, 1995), mothers who completed the Incredible Years BASIC program reported significant reductions in parenting stress and increases in parenting self-efficacy compared with control group mothers. In addition, experimental group mothers were observed to use more praise, fewer critical statements, and fewer coercive behaviors with their toddlers than were control group mothers. One year later (Tucker, Gross, Fogg, Delaney, & Lapporte, 1998), all initial improvements were retained. However, the generalizability of these findings was limited by the small, economically advantaged sample.

The purpose of the present study was to test the effectiveness of the Incredible Years parent program with an ethnically diverse sample of parents of 2- and 3-year-old children enrolled in day care centers serving low-income families. This study builds on and extends previous work in several important ways. First, we systematically examine the effectiveness of this parent training program with a larger sample of parents of 2- and 3-year-old children. Larger samples provide more valid estimates of program effectiveness with parents of very young children.

Second, we evaluate the effectiveness of parent training in a sample in which 97% of the parents are from minority ethnic backgrounds. Although there is extensive research demonstrating the effectiveness of parent training, most studies have relied on samples composed primarily of European American families (Forehand & Kotchick, 1996). There is a paucity of research evaluating the effectiveness of parent training with families of color. The U.S. population is becoming increasingly ethnically diverse, in part because of comparatively higher birth rates among ethnic minorities (U.S. Bureau of the Census, 2000). Given the continual growth in American ethnic minority families projected over the 21st century, more effort needs to be focused on understanding the effectiveness of parent training among families of color.

Third, we examine the effectiveness of this program among families raising children in low-income, underresourced communities in Chicago. Chicago's inner city, with its high rates of youth crime, unemployment, and educational failures, creates a highly stressful context for families raising young children (Wilson, 1987). When parents are under great stress, it can be very difficult to enact or retain skills learned in a parent-training group (Wahler, 1980; Webster-Stratton, 1985b). Thus, we control for the effects of three kinds of parent stress (i.e., neighborhood stress, everyday stressors, and depression) on parent-training effectiveness among low-income families up to 1-year postintervention.

In the current study, we evaluated the relative effectiveness of parent training among low-income parents and their toddlers in day care across four conditions: (a) parent training only (PT), (b) teacher training using the PT program (TT), (c) parent training delivered to parents and teachers in separate groups (PT + TT), and (d) a no-intervention waiting list control condition (C). It was hypothesized that compared with controls (a) parent training

would lead to increased parenting competence (higher parenting self-efficacy, less reliance on coercive discipline strategies, more positive parent behavior, less directive behavior) and reduced child behavior problems and (b) teacher training using the parent training program would lead to reduced child behavior problems in the classroom. It was further hypothesized that parent training delivered to both parents and teachers (PT + TT) would result in superior child behavior outcomes relative to PT, TT, and C.

Method

Day Care Center Selection and Assignment

Participants were parents of 2- and 3-year-old children enrolled in 1 of 11 participating day care centers in Chicago that serve low-income families. Criteria for day care center selection included centers (a) with over 90% of enrolled families meeting income-eligibility requirements for subsidized child care as evidenced by total household income of less than 50% of the state median income, (b) that were licensed by the Department of Children and Family Services, (c) serving families of 2- and 3-year-olds, (d) located in Chicago, and (e) whose administrative staff consented to have their center randomly assigned to an experimental condition. The first 11 eligible centers approached to participate accepted.

Prior to parent recruitment, all participating centers were evaluated on environmental quality using the Early Childhood Environment Rating Scale (Harms & Clifford, 1980). This 7-point observational rating scale includes indices on health and safety; opportunities for language, social, and motor development; physical space; and opportunities for parent–teacher interaction. All centers fell into the "adequate" to "good" range on environmental quality.

The centers varied widely on size and ethnic distribution. For example, center size ranged from having space for 40 toddlers and preschoolers ($n = 3$ centers) to having space for 120 toddlers and preschoolers ($n = 1$ center). In 5 centers, 100% of enrolled children were African American, and in 3 centers, over 80% of enrolled children were Latino. Thus, centers were assigned to groups of centers so that the grouped centers were matched on day care size, ethnic composition, percentage of single-parent families, median income, and day care center quality. These grouped centers were then randomly assigned to one of three conditions: PT + TT ($n = 4$), TT ($n = 4$), or C ($n = 3$) conditions. C centers received no intervention for at least 1 year, after which new parents were recruited and these centers became PT centers.

Matching day care centers was determined to be more effective for obtaining equivalent experimental conditions given the large variability in center characteristics. Similar procedures were used in the Metropolitan Area Child Study, which also sampled from schools in low-income Chicago neighborhoods (Huesmann et al., 1996). However, over the course of our 5-year study, the ethnic composition of several day care centers changed, resulting in an unequal distribution of Latino families. Therefore, ethnicity (Latino versus non-Latino) was entered as a covariate in analyses of experimental outcome.

Participants

Parent inclusion criteria were the parent (a) was the legal guardian of a 2- or 3-year-old child enrolled in the participating day care center and (b) completed all baseline assessments. If the parent had more than one child in the center within the target age range, the younger child was selected for inclusion.

The initial sample consisted of 264 parents and their toddlers out of an estimated target population of 551 2–3-year-old children enrolled in September of the academic year during which parents were recruited. Thirty percent ($n = 78$) of parents were in the combined PT + TT condition, 28% ($n = 75$) of parents were in the PT condition, 20% ($n = 52$) of parents were in the TT condition, and 22% ($n = 59$) of parents were in the C condition. Approximately 90% of the participating parents were mothers, 4.9% were fathers, 1.5% were foster parents, and the remaining were grandparents or other relatives of the toddler. Mean parental age at study enrollment was 27.9 years ($SD = 6.8$). Median annual household income was $13,500.

Over the course of the study, 21.2% ($n = 56$) of the sample dropped out. Therefore, the final sample includes 208 parent–child pairs. Demographic data for this sample are presented in Table 1. Attrition was higher in the two PT conditions (30%, $n = 47$) than in the C and TT conditions (9%, $n = 9$). Reasons for dropout were lack of time ($n = 20$), changes in job schedule or schedule conflicts ($n = 17$), too much stress ($n = 12$), child left the day care center ($n = 4$), our inability to locate ($n = 3$), and parent's repeated failure to show up for scheduled appointments ($n = 3$).

Teacher inclusion criteria were they (a) worked in a classroom that had 2- or 3-year-old children and (b) completed baseline assessments prior to initiating teacher training in their respective center. At baseline, 112 teachers participated in the study. Sixty percent ($n = 67$) were head teachers and 40% ($n = 45$) were teacher assistants. Half of the participating teachers were African American, 22% were Latino, and 28% were White. Over the course of the study, 31% ($n = 35$) of the teachers left the day care center and were lost to follow-up, leaving a final sample of 77 teachers. This rate of attrition is consistent with national rates of teacher turnover in day care centers (Whitebrook, Sakai, Gerber, & Howes, 2001).

Measures

Multiple informants and methods were used to assess changes in parents and children. Parent outcomes of interest included parenting self-efficacy, coercive discipline strategies, and observed parent behavior during a 15-min videotaped parent–child free-play session. In addition, three sources of parent stress (everyday stressors, depression, and neighborhood problems) were assessed to examine whether these stressors were associated with intervention effectiveness in this low-income population. Child behavior

Table 1
Demographic Characteristics of the Sample (n = 208)

Variable	*f*	%
Ethnicity		
African American	119	57.2
Latino	61	29.3
White	7	3.4
Multiethnic	9	4.3
Other	12	5.8
Immigrants to United States	55	26.4
Parent education		
< high school	30	14.4
High school diploma/GED	59	28.4
Vocational training/associate degree	34	16.3
Some college	71	34.1
College degree	14	6.7
Parent employment status		
Full-time	118	56.7
Part-time	27	13.0
In school	22	10.6
Working and going to school	17	8.2
Unemployed	9	4.3
Other	15	7.2
Family structure		
Married	75	36.1
Single	64	30.8
Single with extended family	49	23.6
Partnered	17	8.2
Foster parent	3	1.4

Note. GED = general equivalency diploma.

was assessed by parent and teacher reports and observations of a videotaped parent–child free play. Each of these variables and their measures is described below.

Parenting self-efficacy. Self-efficacy was measured using the Toddler Care Questionnaire (TCQ). The TCQ is a 38-item Likert-type scale for rating parent's self efficacy in managing a range of tasks and situations relevant to raising young children (Gross, Conrad, Fogg, & Wothke, 1994; Gross & Rocissano, 1988). Scores can range from 38 to 190, with higher scores indicating greater parenting self-efficacy.

Validity of the TCQ has been supported by significant correlations with knowledge of child development (Conrad, Gross, Fogg, & Ruchala, 1992), toddler temperamental difficulty (Gross et al., 1994), and improvements in parenting behavior following parent training (Gross, Fogg, & Tucker, 1995). Alpha reliability in the current study was .96.

Parent discipline strategies. Parent discipline strategies were measured using the Parenting Scale (Arnold, O'Leary, Wolf, & Acker, 1993). The Parenting Scale includes 30 discipline situations, each anchored by a desirable strategy at one end of the 7-point scale and by a less desirable strategy at the other end of the scale. Parents are asked to rate the degree to which their discipline strategies are more typical of one anchor than the other. Higher scores indicate parental use of less desirable discipline strategies. Validity of the Parenting Scale was supported in previous research by its associations with observed parent behavior (Arnold et al., 1993). Although the Parenting Scale has three subscales, only the Overreactivity subscale, defined by the parent's use of coercive discipline strategies (e.g., use of yelling, hitting, verbal aggression), is included here.[1] Alpha reliability for this subscale was .66.

Parent behavior. Parent behavior was assessed from a 15-min videotaped parent–child free-play session using the Dyadic Parent–Child Interactive Coding System—Revised (DPICS–R; Webster-Stratton, 1998). This coding system is particularly well suited for measuring the effects of parent training because it focuses observations on key parent and child behaviors that are targeted in the parent program (e.g., commands, critical statements, and physically coercive behaviors). Because of this strong theoretical match with the focus of behavioral parent training, the DPICS–R has been widely used to evaluate parent-training effectiveness with parents and children. Validity has been demonstrated by its ability to differentiate clinic-referred children and their parents from controls (Webster-Stratton, 1985a).

Parent behavior items and their frequencies used to assess improvements in parenting behavior were parent acknowledgements, labeled praise, unlabeled praise, positive parent behavior, positive parent affect, indirect commands, direct commands, critical statements, intrusions, and physical negative behaviors. Intraclass correlations for these DPICS–R variables ranged from .70 to .99.

From these items, two theoretically relevant, normally distributed composite variables were created. The first, *total commands*, was created from combining indirect and direct commands. This composite variable had a Cronbach's alpha of .71. The second parent behavior variable was a composite ratio of all positive parent behavior (acknowledges + labeled praise + unlabeled praise + positive parent behavior + positive parent affect) divided by all negative parent behavior (critical statements + critical commands + intrusions + physically negative behaviors). This ratio was then transformed using a logit transformation to create a variable called *positive parent behaviors* that met the assumptions of a normal distribution. Because this composite ratio was transformed, it was not possible to estimate reliability using Cronbach's alpha. Instead, reliability was estimated using the mean item–scale correlation, which was .261.

Parent stress. Parent stress was measured in three ways to capture the complexity and pervasiveness of stress in the lives of families living in low-income urban communities. We analyzed the three sources of parent stress, depression, everyday stress, and neighborhood problems, separately rather than combining them into a latent stress construct so as to better interpret the effects of stress on the outcomes.

Depression. Depression was measured using the Center for Epidemiological Studies Depression Scale (CES-D), a 20-item measure of depressive symptoms designed for use in the general population (Radloff, 1977). Validity of the CES-D has been supported by its consistent associations with other well-established depression symptom measures (Gotlib & Crane, 1989) and its 99% sensitivity rate for identifying cases of acute depression (Weissman, Sholomskas, Pottenger, Prusoff, & Locke, 1977). The alpha reliability of the CES-D in this study was .85. Using a cut-off score of 16, 30.7% ($n = 81$) of the parents fell into the depressed range on the CES-D.

Everyday stress. Everyday stress was measured using the Everyday Stressor Index (ESI). This 20-item measure was created by Hall and Farel (1988) from interviews with low-income mothers with young children about common daily stressors they experience. Using the ESI, parents rate the extent to which they are bothered by such stressors as financial concerns, employment problems, parenting concerns, family responsibilities, and interpersonal conflicts. Higher scores indicate greater everyday stress. The alpha reliability of the ESI in this study was .86.

We also examined the stressfulness of the neighborhoods in which the parents lived. Neighborhood stress was measured by the Neighborhood Problem Scale, which includes 22 environmental stressors that are commonly found in urban economically disadvantaged neighborhoods (Elder, Eccles, Ardelt, & Lord, 1995). Parents rate the degree to which each item is viewed as a problem in their neighborhood on a scale of 1 (*not a problem*) to 3 (*a big problem*). Parents in this sample rated their neighborhoods as having "big problems" with drugs (49%), gangs (43%), guns and violence (39%), high unemployment (37%), attacks or robberies on their street (20%), and rapes or sexual assaults (11%). Alpha reliability of the Neighborhood Problem Scale in the current study was .94.

Child behavior problems. Children's behavior problems were assessed using three sources of information: parent and teacher reports of child behavior problems at home and in the classroom and an observational rating of aversive child behaviors based on a 15-min videotaped parent–child play session. Each source was analyzed separately because each was hypothesized to have a different outcome depending on the experimental condition. In addition, the intercorrelations among these three child behavior problem measures were low (rs = –.05–.13). Low correlations among multiple sources of child behavior data are not unusual given the large variability in informant contexts, biases, and abilities to discriminate conceptually relevant but distinct behaviors (Coie & Dodge, 1988; Ladd & Profilet, 1996). Correlations may have been further attenuated by the use of a relatively brief, low-frustration situation for obtaining observation data.

Parent-reported child behavior problems. We measured parent-reported child behavior problems with the Eyberg Child Behavior Inventory (ECBI; Robinson, Eyberg, & Ross, 1980), a 36-item inventory for children from 2 to 16 years old. The inventory includes two scales. The Intensity Scale indicates the frequency with which each behavior has been occurring over the past few weeks on a scale of 1 (*the behavior never happens*) to 7 (*the behavior is always happening*). The Problem Scale measures the total number of behavior problems reported by the parent in this same time period. Numerous studies have supported the validity of the ECBI (Eyberg & Pincus, 1999; Eyberg & Robinson, 1983; Gross et al., 1999; Koniak-Griffin & Verzemnicks, 1995). Recently, Burns and Patterson (2000) factor analyzed the ECBI structure and identified three factors from the Intensity Scale (i.e., Oppositional Defiant Behavior Toward Adults, Inattentive Behavior, and Conduct Problem Behavior), which they suggest are relevant for examining treatment outcomes. In the present study, the alpha reliabilities of these three factors respectively were .79,

[1] One of the discipline subscales, Laxness, was included in our original analysis and found not to be significantly affected by parent training. The second discipline subscale, Verbosity, was found to have a low alpha reliability (.10) and was dropped from subsequent analyses.

.73, and .72. Internal consistency reliability for the total Intensity Scale was .88 and for the Problem Scale was .92. On the basis of the authors' recommendation of using a criterion score of 15 on the Problem Scale (Eyberg & Pincus, 1999), 19.3% ($n = 51$) of the toddlers fell into the "clinical range" on behavior problems.

Teacher-reported child behavior problems. Children's behavior problems in the classroom were assessed using Kohn's Problem Checklist (KPC; Kohn, 1977). The KPC is a 49-item rating scale designed for use by teachers in day care centers. Child behavior is evaluated along two dimensions: apathy–withdrawal (internalizing behavior problems) and anger–defiance (externalizing behavior problems). Teachers rate each item as either "very typical," "somewhat typical," or "not at all typical" of the target child's behavior in the classroom during the past week. Higher scores suggest greater behavioral difficulty. Validity of the KPC has been supported by its significant associations with preschool children's functioning (Kohn, 1977) and with maternal depressive symptomatology (Gross, Conrad, Fogg, Willis, & Garvey, 1995). In the current study, alpha reliabilities of the apathy–withdrawal and anger–defiance dimensions were .96 and .97, respectively. In addition, we assessed teacher interrater reliabilities with 24 toddlers. Although the interrater reliability of the anger–defiance dimension was high ($r_s = .82$), the interrater reliability for apathy–withdrawal was low ($r_s = -.39$), which suggested that teacher ratings on this internalizing behavior dimension may not be accurate. Therefore, this dimension was not used in any further analyses. For the remainder of the study, KPC scores refer only to classroom behavior problems based on the externalizing dimension anger–defiance. Using a KPC cut-off score of 40 (one standard deviation above the sample mean), 14.8% ($n = 39$) of the children received high classroom behavior problem scores. However, only 3% ($n = 8$) of these children also scored in the clinical range on the ECBI Problem scale.

Observer rated child behavior problems. We assessed observer-rated child behavior problems using a ratio of aversive child behaviors to positive child behaviors created from eight DPICS–R items. Aversive child behaviors included all coded incidences of child noncompliance, destructive behavior, physically negative behavior, crying, whining, yelling, and smart talk (e.g., swearing, insulting remarks) observed during the videotaped parent–child free play. Positive child behaviors included all coded incidences of positive verbal and nonverbal behaviors observed during the same play session. The ratio of aversive to positive child behaviors was calculated and then transformed using a logit transformation to create a variable called *observer-rated negative child behavior* that met the assumptions of a normal distribution. Interrater reliabilities for DPICS–R variables included in this item were .87–.95. The mean item–scale correlation was .25.

Consumer satisfaction. Consumer satisfaction was assessed at postintervention using an end-of-program consumer satisfaction questionnaire. To compare perceptions among this ethnically diverse Chicago sample with those from previous studies, we used the same consumer satisfaction survey as Webster-Stratton et al. (2001). These questionnaires assess parents' and teachers' perceptions of (a) improvements in children's behavior, (b) program difficulty, and (c) program utility along a Likert-type continuum.

Procedures

Recruiters, called family interviewers, were assigned to day care centers to develop relationships with parents and staff, recruit parents into the study, and obtain baseline and follow-up assessments from parents and teachers. Family interviewers were given a target number of parents to enroll in each center before we could schedule and begin a parent or teacher group (12–15 parents). However, no parent was refused enrollment if they wished to participate after the target enrollment had been reached if the training group had not yet begun. All teachers assigned to toddler classrooms attended training groups in the TT and PT + TT conditions.

Parents and children were assessed four times over a 15–18 month period (baseline, immediate postintervention, 6-months postintervention, and 1-year postintervention). Parent assessments, which included a set of questionnaires and a videotaped parent–child free play session, took place at the day care center or parent home, whichever location the parent preferred. As we anticipated that some of the parents may have low reading skills, all questionnaires were read aloud as parents read along unless parents requested to independently complete the questionnaires. Questionnaires were available in English or Spanish, and bilingual family interviewers were assigned to day care centers with a high proportion of Spanish-speaking parents.

Parents and children were videotaped playing as they normally would for 15 min. Videotaped play sessions were later coded by European American observers (in Seattle) who were blind to study hypotheses and participant's group assignment.

Parents and teachers were paid for completing the research assessments. Parents received $30 for each completed assessment phase. If they remained in the study for the full year, they received a total of $120 and copies of their videotaped play sessions. Teachers received $10 for each completed child assessment.

The Intervention

The 12-week parent training program used in this study, the Incredible Years BASIC Program, was developed by Webster-Stratton (1981; revised in 1987). Parents met weekly at their children's day care center in groups of 8–12 parents for twelve 2-hr sessions in the evenings. Teachers met in weekly groups of 4–12 teachers, depending on the size of the day care center, for twelve 2-hr sessions in the afternoons during the children's naptimes. Led by two trained group leaders, group members viewed and discussed a series of brief videotaped vignettes of parent and child models engaged in a variety of situations. Each vignette is matched with a set of discussion questions in the leader's manual that group leaders use to focus participants' attention and for group discussion. Weekly homework assignments and handouts are used to enhance learning and generalizability of the program principles to the home and classroom settings.

For the current study, videotape vignettes from the Incredible Years BASIC program were selected on the basis of inclusion of preschool-aged children in the vignette and the developmental appropriateness of the scene for toddlers. For example, vignettes showing parents using a star chart for encouraging positive behavior were included but vignettes showing parents using point systems were not included. Vignettes depicting a time-out with a toddler were used but vignettes of parents giving a time-out to school-aged children were excluded. Vignettes shown covered the topics child-directed play (17 vignettes), helping young children learn (7 vignettes), using praise and rewards (19 vignettes), setting effective limits (42 vignettes), handling misbehavior (30 vignettes), and problem solving (1 vignette). Parents and teachers were shown the same vignettes in their respective group sessions.

In addition, homework assignments were added that increased collaboration between parents and teachers. For example, following the session on using praise and rewards, parents were each instructed to give written or verbal praise to their children's teacher. Teachers were given the same assignment for parents. Following the session on problem solving, parents were encouraged to use their new skills with their child's teacher to solve a problem related to their child. Teachers were similarly instructed to use the problem-solving strategies with a parent. From 1997 to 1999, a total of 16 parent groups and 8 teacher groups were conducted. No booster sessions were offered in this study.

Parent and teacher groups were led by nurses, 64% ($n = 9$) of whom had graduate degrees. Group leaders completed a 1-day workshop led by Carolyn Webster-Stratton and received ongoing supervision and feedback from Deborah Gross. New group leaders were always paired with an experienced group leader. In addition, a weekly protocol checklist was completed by group leaders to ensure that key aspects of the program were

consistently implemented (e.g., designated vignettes shown, discussion questions used, homework assignments collected and discussed). Two group leaders were assigned to each group. At least one of the group leaders in each group was from the same ethnic background as the majority of parents in that group.

Intervention dosage was defined as the number of group sessions attended by program participants. Among parents who completed parent training, average attendance was 7.6 ($SD = 3.4$) sessions in the PT condition and 7.2 ($SD = 3.2$) sessions in the PT + TT condition. Mean group attendance among teachers was 8.80 ($SD = 2.5$) group sessions in the TT condition and 8.79 ($SD = 2.3$) group sessions in the PT + TT condition. There were no significant differences in dosage by condition.

Data Analytic Plan

The hypotheses were tested using growth curve modeling (Browne & Du Toit, 1991; Burchinal & Applebaum, 1991) with the MIXREG software program (Hedeker & Gibbons, 1996). Growth curve modeling is particularly useful when testing interventions designed to affect behaviors that are changing over time as part of normal maturational development (Curran & Muthen, 1999). For parent and child outcomes, each hypothesis was tested with the outcome variable entered as the dependent variable. The independent variables included parameters for time, polynomial expansion of time (see later description), intercept differences by experimental condition, parent ethnicity (Latino vs. non-Latino), parent stress (everyday stress, depression, and neighborhood stress each entered as separate independent variables), and associated interaction terms (e.g., Time × Experimental Condition).

The three polynomial terms included in the initial regression model were (a) a linear effect in which change occurs over time in a simple linear fashion (the coefficient vector was **0**, **1**, **2**, **3**), (b) a quadratic effect in which the time effect is squared (the coefficient vector was **0**, **1**, **4**, **9**), and (c) a cubic effect in which the time effect is cubed (the coefficient vector was **0**, **1**, **8**, **27**). For each effect, the intercept is zero. Linear effects reflect simple additive changes over time whereas the quadratic and cubic effects are sensitive to multiple postintervention changes. For example, when combined in an interaction term with experimental condition, significant quadratic and cubic effects can indicate initial improvements in one experimental condition that attenuate over time.

To compare the effects of receiving parent training on parent and child outcomes, both PT conditions (PT and PT + TT) were combined and contrasted with the no-PT conditions (TT and C). To compare the effects of receiving teacher training on parent and child outcomes, the two conditions in which teacher training was provided (TT and PT + TT) were combined and contrasted with the no-teacher-training conditions (PT and C). To examine the additive effects of combining parent and teacher training, an interaction term of PT + TT training was compared with the other three conditions. These dummy-coded vectors produce group effects that parallel those obtained in a two-way analysis of variance (Bock, 1975; Finn, 1974). Simple treatment effects and interaction effects can then be examined in a single analysis without increasing Type 1 error. As the percentage of Latino families differed by experimental condition, ethnicity (Latino vs. non-Latino) was also included in the model.

A two-level model was used with family at the second level and the time points within each family at the first level. Response to the intervention is estimated as a rate of change in the dependent variables across time. For example, positive parent behaviors would be expected to increase more rapidly over time in the experimental groups than in the control group. To test this, we estimated the following model:

$$\text{(Dependent variable)} = f\text{(time effects, treatment effects,}$$
$$\text{Time} \times \text{Treatment interactions, stress, ethnicity).}$$

In this model, it was hypothesized that there would be statistically significant Time × Treatment effects. Statistically significant effects controlling for stress and ethnicity were retained in the final model.[2] A more detailed description of this model is included in the Appendix and a complete listing of all the terms in the full model appears in the notes to Table 2.[3]

This initial model was reduced in each subsequent analysis by eliminating one nonsignificant ($p > .05$) parameter at a time. If more than one parameter was nonsignificant, the parameter with the smallest z score was eliminated first. If higher order parameters were significant (e.g., the cubic time effect), then composite lower order parameters were retained (e.g., the quadratic time effect; Bryk, Raudenbush, & Congdon, 1996).

Given the complexity of these models, results were further illuminated by examining significant parent-training effects on outcome scores (without adjusting for control variables) using a one-way analysis of variance (ANOVA) with planned contrasts. These one-tailed contrasts tested for significant changes in scores from baseline to postintervention (short-term effects), from baseline to 1-year follow-up (long-term effects), and from postintervention to 1-year follow-up (attenuation effects).

The distributions of the child classroom behavior problem (KPC) scores were highly skewed, and efforts to transform the data to meet the assumptions of a normal distribution were unsuccessful. Therefore, this variable was not analyzed using growth curve modeling. Instead, a KPC cut-off score was established using one standard deviation above the total sample mean to group child classroom behavior problem scores into low-risk (KPC $<$ 40) and high-risk problem groups (KPC $\geq$ 40). Chi-square analyses were then used to estimate the effect of the intervention on changes in classroom behavior problems from one risk group to another.

Results

Sample Attrition

Over the course of the study, 21.2% ($n = 56$) of parents and 31.2% ($n = 35$) of teachers dropped out of the study. Among parents, 73.2% ($n = 41$) of the attrition occurred between baseline and the first postintervention assessment; therefore, postintervention data are not available for these families. Another 10.7% ($n = 6$) of the attrition occurred between the first postintervention assessment and the 6-month follow-up, and 16.1% ($n = 9$) of the dropout occurred between the 6-month and the 1-year follow-up. Among teachers, 28.6% ($n = 10$) of the dropout occurred between the baseline and first postintervention assessment, 48.6% ($n = 17$) occurred between the first postintervention assessment and the 6-month follow-up, and 22.9% ($n = 8$) occurred between the 6-month and the 1-year follow-up. There were no significant differences between teachers who dropped out of the study and those who remained.

Parents who dropped out of the study had significantly lower overreactive discipline scores than parents who remained, $t(262) = -2.48$, $p < .05$, indicating that dropouts were less likely to use harsh and coercive discipline strategies with their children than

[2] We chose to control for the effects of stress and ethnicity on outcomes rather than test for their moderator effects because moderator effects would be difficult to interpret in the context of the growth curve models used in these analyses. A more straightforward approach to estimating the moderator effects of these variables would be to use a multigroup structural equation model (e.g., LISREL), an examination that is beyond the scope of this article.

[3] The growth curve models presented in this article are based on the 208 participants who remained in the study. To assess the effect of dropout on the results of these analyses, we also ran the final growth curve models on the initial sample of 264 participants. The pattern of significant parameters remained unchanged as a result of using the larger sample. This indicates that participant attrition did not modify the interpretation of results.

Table 2
Final Model Estimates for Parent and Child Outcomes

Estimate	Parent self-efficacy	Coercive discipline	Positive parent behavior	Parent commands	Child behavior-intensity[a,b]	Child behavior-problems[b]	Negative child behavior
Intercept effects							
Intercept	162.2*	2.0*	1.8*	62.1*	84.9*	0.7	−0.2
Ethnicity[c]	4.7*	−0.4*	−0.5*	−6.2	−5.1	—	0.4
Parent training[d]	4.3	0.0	0.2	11.3	—	—	−0.5*
Teacher training[e]	5.5*	−0.2	—	5.3	—	0.7	−0.3
PT + TT[f]	−7.5	0.2	—	−13.1	—	—	0.3
Time effects							
Time linear[g]	0.6	0.5*	−0.0	44.6*	−7.1*	2.1	−0.6
Time quadratic[h]	—	−0.4*	0.0	−55.3*	2.3*	−3.0	0.5
Time cubic[i]	—	0.1*	—	12.5*	—	0.7*	−0.1
Time × Condition							
Teacher training linear[j]	—	—	—	−55.7*	—	−3.8	—
Teacher training quadratic[k]	—	—	—	48.3*	—	4.2	—
Teacher training cubic[l]	—	—	—	−10.0*	—	−1.0*	—
Parent training linear[m]	2.1*	−1.0*	0.4*	−65.7*	—	—	—
Parent training quadratic[n]	—	0.8*	−0.1*	52.3*	—	—	—
Parent training cubic[o]	—	−0.2	—	−10.6*	—	—	—
P + T linear[p]	—	—	—	54.1*	—	—	—
P + T quadratic[q]	—	—	—	−48.6*	—	—	—
P + T cubic[r]	—	—	—	10.4*	—	—	—
Change due to ethnicity linear[s]	—	—	—	−45.6*	7.3*	—	0.1
Change due to ethnicity quadratic[t]	—	—	—	50.4*	−2.8*	—	−0.7
Change due to ethnicity cubic[u]	—	—	—	−11.4*	—	—	0.2
Everyday stress[v]	−0.2*	0.02*	—	—	0.3*	0.1*	—
Depression[w]	−0.3*	0.02*	—	—	0.5*	0.1*	—
Neighborhood stress[x]	—	—	—	—	—	—	—
Random coefficients							
Intercept[y]	194.0	0.3	0.6	709.6	491.8	22.8	0.5
Time[z]	15.0	0.0	0.0	41.9	14.1	1.5	0.1
Covariance[aa]	−28.6	−0.0	−0.0	−128.1	14.1	−0.5	−0.1

Notes All parameters are raw coefficients. Dash indicates the variable was eliminated during the step-wise process; PT + TT = parent training + teacher training condition. ECBI = Eyberg Child Behavior Inventory.
[a] ECBI Total Intensity Scale only. ECBI Intensity factors not included in table. [b] ECBI Problem Scale. [c] Fixed ethnicity intercept term was scored Latinos (0) versus non-Latinos (1). [d] Fixed parent-training intercept term. [e] Fixed teacher-training intercept term. [f] Fixed intercept term for parent + teacher training combined. [g] Fixed linear time term. [h] Fixed quadratic time term. [i] Fixed cubic time term. [j] Fixed Teacher Training × Linear Time interaction term. [k] Fixed Teacher Training × Quadratic Time interaction term. [l] Fixed Teacher Training × Cubic Time interaction term. [m] Fixed Parent Training × Linear Time interaction term. [n] Fixed Parent Training × Quadratic Time interaction term. [o] Fixed Parent Training × Cubic Time interaction term. [p] Fixed Parent + Teacher Training Combined × Linear Time interaction term. [q] Fixed Parent + Teacher Training Combined × Quadratic interaction term. [r] Fixed Parent + Teacher Training Combined × Cubic interaction term. [s] Fixed Ethnicity (Latino = 0, Non-Latino = 1) × Linear Time interaction term. [t] Fixed Ethnicity × Quadratic Time interaction term. [u] Fixed Ethnicity × Cubic Time interaction term. [v] Fixed time covarying linear everyday stress term. [w] Fixed time covarying linear depression term. [x] Fixed time covarying neighborhood stress term. [y] Random overall intercept term. [z] Random linear time term. [aa] Random Intercept × Linear Time covariance term.
* $p < .05$.

parents who were retained. Attrition was also related to parent ethnicity. Parents who remained in the study were more likely to be Latino, $\chi^2(1, N = 262) = 7.60$, $p < .01$. Attrition was unrelated to other parent–child outcomes or demographic variables or to parent stress.

Nesting Effects: Baseline Scores by Experimental Condition, Day Care Center, and Training Group

All baseline dependent measures were compared by experimental condition and training group nested within day care center. Among the four experimental conditions, the only variable that was significantly different at baseline was the teacher rating of child behavior problems using the KPC. KPC scores differed significantly on a center-nested within condition effect, $F(11, 10) = 4.07$, $p < .02$. When baseline scores were examined for equivalence by parent group within day care center ($n = 16$, PT and PT + TT), teacher ratings of child behavior problems in the classroom was the only significant variable, $F(16, 246) = 4.66$, $p < .01$. There were no other baseline differences among the experimental conditions, day care centers, or training groups. Given the limited effects associated with the nested data structure, we did not include center or group effects in subsequent analyses.

Effect of Experimental Condition on Parent Outcomes

Mean scores on parent self-efficacy, discipline strategies, stress, and observed positive parent behavior by experimental condition and time are presented in Table 3. The estimated effects from the

Table 3
Means and Standard Deviations for Parent Self-Efficacy, Discipline, Stress, and Parent Behavior Scores by Time and Experimental Condition (n = 208)

	Baseline				Postintervention				6-month follow-up				1-year follow-up			
Variable	PT + TT	PT	TT	C	PT + TT	PT	TT	C	PT + TT	PT	TT	C	PT + TT	PT	TT	C
Self-efficacy																
M	156.8	160.3	159.8	154.6	161.4	163.9	163.2	155.4	165.7	167.6	163.6	156.8	164.5	171.4	160.8	157.2
SD	13.6	21.0	18.9	24.8	18.3	13.0	16.1	25.4	14.8	14.5	19.1	20.4	17.3	13.7	17.3	22.0
Coercive discipline																
M	2.6	2.6	2.4	2.7	2.4	2.2	2.5	2.7	2.6	2.3	2.4	2.5	2.6	2.4	2.4	2.7
SD	0.8	0.9	0.8	0.9	0.9	0.8	0.8	0.9	0.8	0.9	0.9	0.9	0.8	0.9	0.8	1.0
Stress																
Everyday stress																
M	36.8	37.7	37.1	40.1	35.8	35.2	33.3	36.2	35.4	36.8	35.4	36.9	34.2	36.1	33.1	34.9
SD	11.3	10.9	10.5	10.4	11.4	9.0	8.1	10.6	10.6	13.1	8.7	8.0	8.9	11.0	8.0	9.8
Depression																
M	12.6	12.4	11.9	14.6	10.7	11.7	12.2	13.8	11.1	12.6	11.8	14.3	11.9	12.1	12.1	14.4
SD	10.0	8.7	9.1	9.5	8.1	7.7	7.5	10.9	8.4	9.4	8.4	9.2	9.9	12.0	8.1	12.1
Neighborhood stress																
M	34.6	40.3	41.3	40.4	34.7	40.4	38.9	39.8	35.1	38.1	40.6	41.1	37.4	38.7	37.0	40.9
SD	10.8	10.7	16.1	11.8	11.2	12.5	12.9	12.5	10.9	10.9	12.4	12.3	19.4	13.1	12.8	12.3
Positive behavior																
M	1.8	1.4	1.6	1.5	2.1	2.1	1.6	1.6	2.3	1.9	1.7	1.8	2.4	1.9	2.0	1.8
SD	1.3	1.3	1.0	1.0	1.3	1.4	1.1	1.1	1.3	1.0	1.0	1.0	1.3	1.3	1.2	1.3
Commands																
M	61.5	65.9	63.9	58.3	33.7	38.9	45.6	54.6	31.9	44.9	44.0	37.4	28.5	33.8	40.0	37.3
SD	37.9	36.7	41.5	35.2	28.1	22.3	37.6	35.6	21.5	32.2	32.8	25.0	16.2	24.7	37.7	27.8

Note. PT + TT = parent training + teacher training condition; PT = parent training condition; TT = teacher training condition; C = waiting list control.

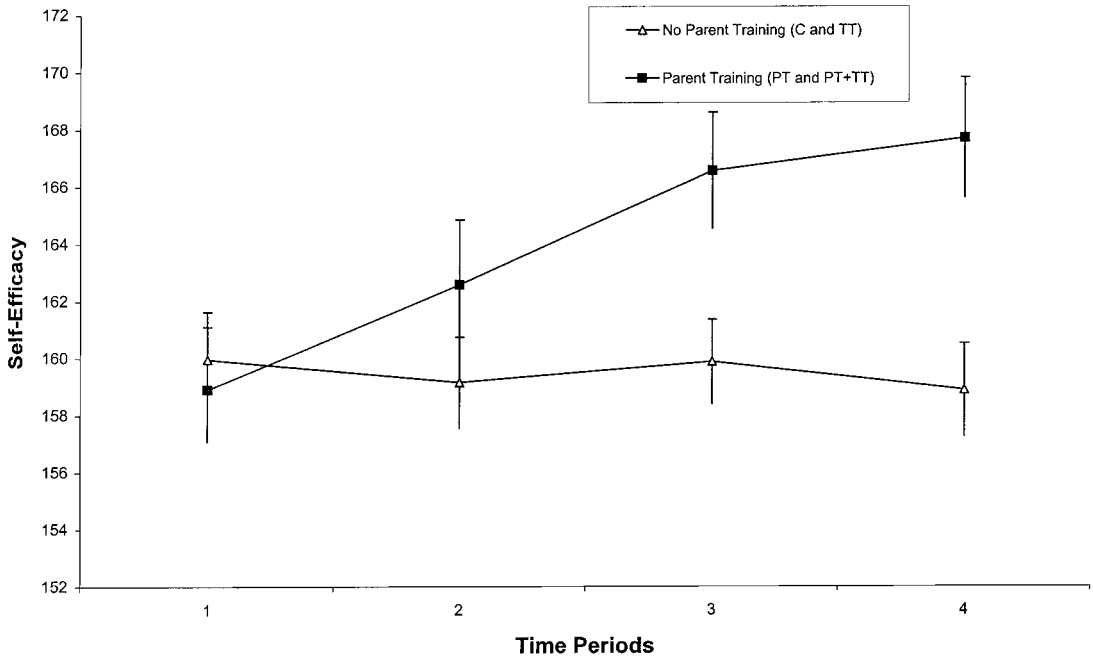

Figure 1. Mean parenting self-efficacy over time by parent training conditions. Time periods include baseline (1), postintervention (2), 6-month follow-up (3), and 1-year follow-up (4). Anchor bars indicate the standard error. C = waiting list control; TT = teacher training condition; PT = parent training condition; PT + TT = parent training + teacher training condition.

final growth curve models for each of the dependent variables are presented in Table 2.

Parent self-efficacy. For the dependent variable parent self-efficacy, the final model included significant effects for ethnicity, depression, and everyday stress, and a linear parent training effect. Specifically, Latino parents had lower parent self-efficacy than non-Latino parents, and parents with lower parent self-efficacy had higher everyday stress and depression. After controlling for the effects of ethnicity, depression, and everyday stress, parents who received parent training reported a 2.1 point greater increase in self-efficacy scores at each time point up to 1-year postintervention compared with parents who did not receive parent training. Changes in unadjusted mean parenting self-efficacy scores over time comparing parents who received training against those who did not are shown in Figure 1. Planned contrasts of mean scores revealed a significant improvement in parent self-efficacy among parents who received parent training from baseline to the 1-year follow-up, $t(183) = -2.68$, $p < .01$ (effect size (ES) = .40).[4] No short term or attenuation effects were found.

Discipline strategies. For the dependent variable of coercive discipline, the final model included significant effects for ethnicity; depression; everyday stress; and linear, quadratic, and cubic parent training effects. Specifically, (a) Latino parents reported using less coercive discipline strategies than non-Latino parents and (b) parents who used more overreactive discipline with their children reported greater everyday stress and depression. After controlling for the effects of ethnicity, depression, and everyday stress, parents who received parent training reported a 1.0-point linear drop in coercive discipline from baseline to postintervention compared with parents in the C and TT groups. This suggests an immediate linear parent training effect on parents' use of coercive discipline strategies not seen in the C and TT conditions. However, there were subsequent quadratic effects (the inverted and uninverted "v" shapes in Figure 2 from baseline to 6-month follow-up) and smaller cubic effects (the horizontal "zigzag" pattern of the no parent training condition from baseline to the 1-year follow-up). This combination of linear and curvilinear effects suggests that the intervention was effective in reducing coercive discipline at postintervention but the effect disappears by the 6-month follow-up. Further analysis of changes in mean scores with planned contrasts reveals a significant improvement in coercive discipline strategies among PT and PT + TT parents from baseline to postintervention, $t(188) = 2.98$, $p < .01$ (ES = .42) followed by a significant backslide of effects from postintervention to 1-year follow-up, $t(171) = -2.25$, $p < .01$ (ES = .34). This supports the hypothesis that parent training leads to reductions in parental use of coercive discipline strategies when offered directly to parents. However, these effects were not retained to 1-year postintervention.

Positive parent behavior. For the dependent variable positive parent behavior the final model included significant effects for ethnicity and for linear and quadratic parent training effects. The significant parameter for ethnicity indicates that Latino parents used more positive parent behaviors with their toddlers than non-Latinos. The significant linear effect indicates an immediate postintervention effect of parent training leading to more positive parenting behaviors. The significant negative quadratic term indi-

[4] Effect sizes were calculated with Cohen's *d* (Cohen, 1977).

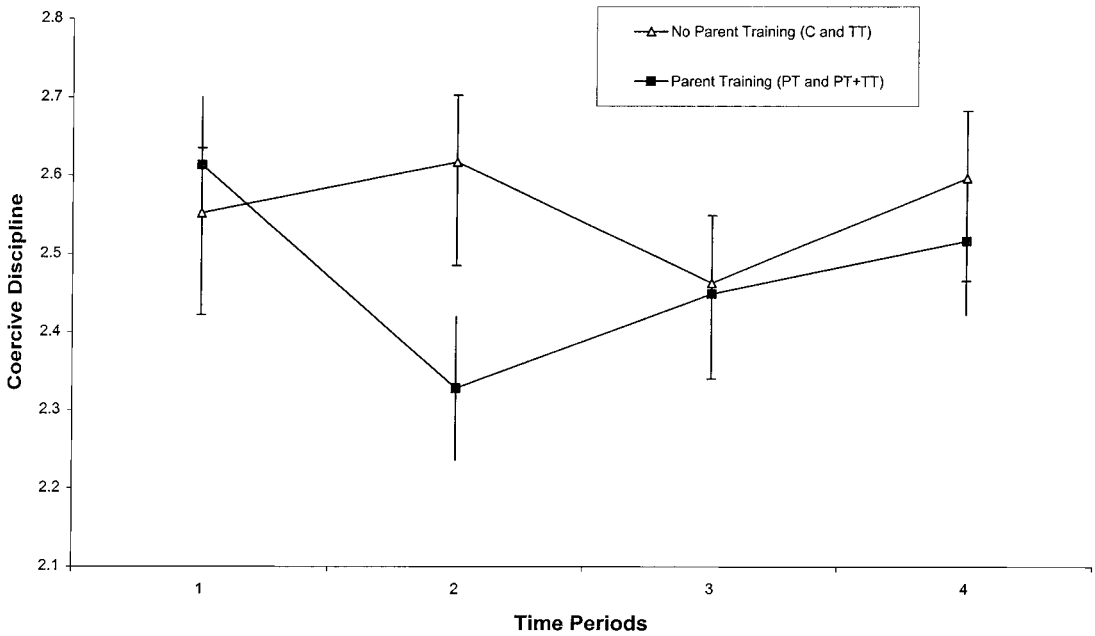

Figure 2. Mean coercive discipline strategies over time by parent training conditions. Time periods include baseline (1), postintervention (2), 6-month follow-up (3), and 1-year follow-up (4). Anchor bars indicate the standard error. C = waiting list control; TT = teacher training condition; PT = parent training condition; PT + TT = parent training + teacher training condition.

cates a small attenuation of effects at the follow-up assessments. Using unadjusted means for parent positive behavior scores, Figure 3 shows an initial improvement in observed positive parent behaviors among parents who received parent training that leveled out from postintervention to the 1-year follow-up. Analysis of changes in mean scores with planned contrasts reveals a significant improvement in observed positive parent behavior among PT and PT + TT parents from baseline to postintervention, $t(191) = -2.14$, $p < .01$ (ES = .30) without statistically significant backsliding from postintervention to 1-year follow-up, $t(171) = .76$, *ns*. Therefore, the hypothesis that parent training would lead to more observed positive parent behavior was supported. This effect was found only when the intervention is offered directly to the parents.

Parent commands. The dependent variable parent commands was log-transformed to achieve a more normal distribution. As shown in Table 2, the final model included significant effects for ethnicity and polynomial time effects for all three experimental conditions (i.e., PT, TT, and PT + TT). Non-Latino parents used more commands than Latino parents but demonstrated greater reductions in their use of commands with their children. After controlling for ethnicity, parents in all three experimental conditions demonstrated significant reductions in their use of commands during free play compared with parents in the control condition. Examination of the means in Table 3 shows roughly equivalent reductions in commands across all three intervention groups and a smaller decrease for the control group. Reductions in the combined PT + TT condition were not greater than those found in the PT and TT conditions. Figure 4 shows mean changes over time comparing frequencies of commands among control parents with those observed among parents in the other three experimental groups. Analysis of changes in mean scores with planned contrasts showed a significant drop in parents' observed use of commands among PT, TT, and PT + TT parents from baseline to postintervention, $t(190) = 6.73$, $p < .01$ (ES = .44) and a significant long-term effect from baseline to 1-year postintervention, $t(182) = 6.23$, $p < .01$ (ES = .28). This decrease in commands supports the hypothesis that the parent training intervention leads to reductions in parents' directiveness with their children during free play. This effect was apparent when the intervention was delivered directly to parents or to day care teachers.

Effect of Experimental Condition on Child Outcomes

Mean scores on child behavior problems as assessed by parents, teachers, and observers by experimental condition and time are presented in Table 4. The estimated effects based on the final growth curve models for parent reported behavior problems and observed negative child behavior are presented in Table 2.

Parent-reported child behavior problems. Parent everyday stress and depression were positively related to parent-reported child behavior problems (ECBI Problem scores). After controlling for stress and depression, we found the intervention did not appear to have a meaningful effect on child problem scores. There was a significant cubic effect for parents who were not in the TT conditions. This effect is due to a significant drop in the mean ECBI Problem scores among parents in the PT and C conditions at 6 months postintervention. This change in child behavior problem scores appears to be a chance finding because ECBI Problem scores subsequently increased at the 1-year follow-up and converged with those in the TT conditions. Using a one-way ANOVA and planned contrasts, we found no significant effects for mean

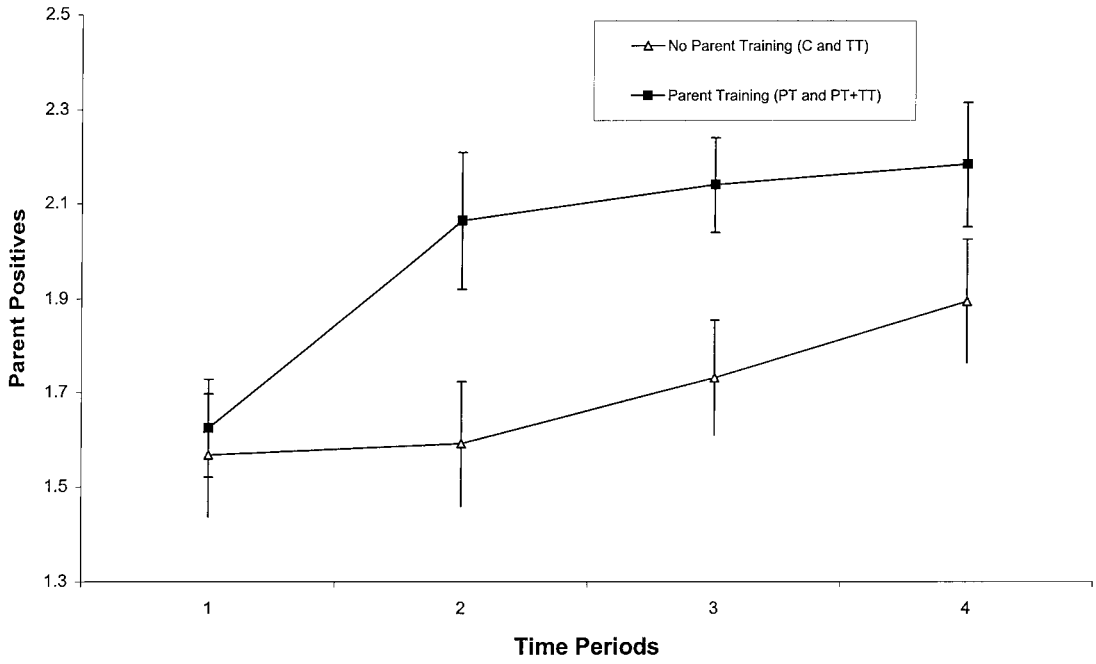

Figure 3. Mean positive parent behaviors over time by parent training conditions. Time periods include baseline (1), postintervention (2), 6-month follow-up (3), and 1-year follow-up (4). Anchor bars indicate the standard error. C = waiting list control; TT = teacher training condition; PT = parent training condition; PT + TT = parent training + teacher training condition.

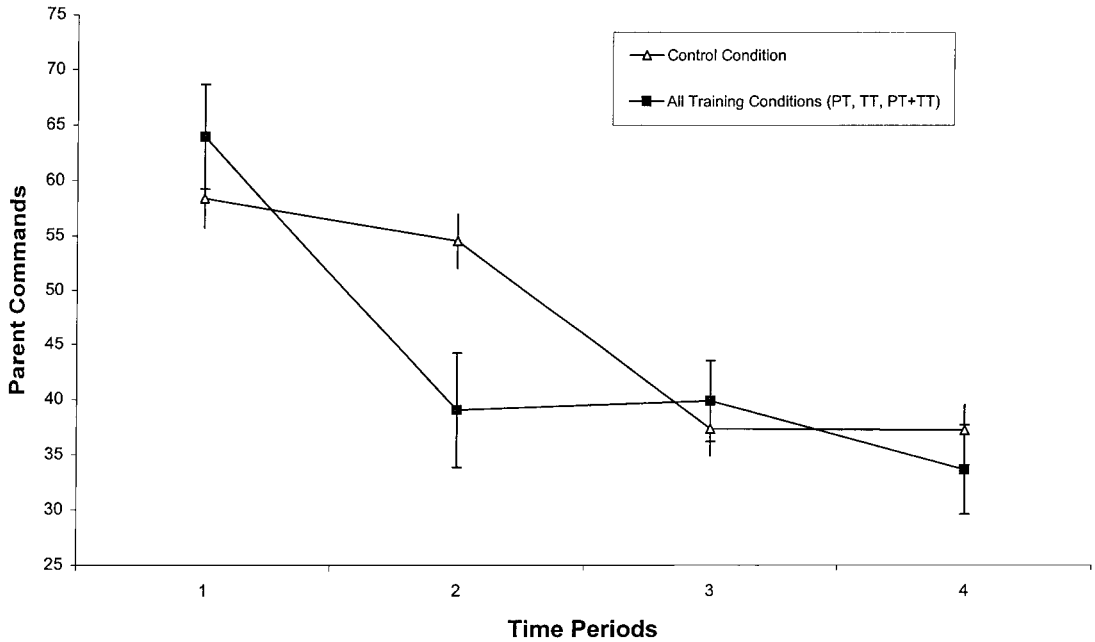

Figure 4. Mean parent use of commands over time by training conditions. Time periods include baseline (1), postintervention (2), 6-month follow-up (3), and 1-year follow-up (4). Anchor bars indicate the standard error. C = waiting list control; TT = teacher training condition; PT = parent training condition; PT + TT = parent training + teacher training condition.

Table 4
Mean Scores for Child Behavior Problems by Time and Experimental Condition

Variable	Baseline				Postintervention				6-month follow-up				1-year follow-up			
	PT + TT	PT	TT	C	PT + TT	PT	TT	C	PT + TT	PT	TT	C	PT + TT	PT	TT	C
Behavior problems (ECBI)																
Intensity total																
M	100.0	97.4	97.5	105.0	98.3	97.3	92.8	100.0	100.5	93.2	96.5	96.6	100.0	90.9	95.0	97.1
SD	25.1	27.3	27.1	30.9	25.1	26.5	21.7	29.7	23.2	28.2	30.3	24.9	24.8	26.7	24.5	26.8
Oppositional factor																
M	32.5	31.7	28.9	33.3	31.0	31.5	28.0	29.4	30.9	28.2	29.6	27.9	29.9	27.2	28.6	28.9
SD	10.0	12.5	10.8	11.9	10.0	10.7	9.3	9.3	10.9	12.1	11.8	8.8	10.7	10.3	8.8	10.3
Inattentive factor																
M	10.6	10.2	11.0	10.4	11.7	10.1	10.1	11.2	10.7	9.3	9.6	10.9	10.3	9.0	10.3	10.3
SD	4.2	4.6	4.8	5.0	4.7	4.2	3.3	5.6	4.2	3.6	3.5	5.7	3.9	3.9	4.7	5.1
Conduct factor																
M	17.0	17.4	16.4	18.8	16.9	17.6	16.8	18.3	18.8	17.9	17.2	18.1	19.3	17.5	17.3	18.6
SD	6.8	6.7	6.3	8.1	6.3	6.9	6.3	7.0	6.4	6.9	7.1	7.2	6.9	5.9	7.0	7.2
Problems total																
M	8.6	7.2	6.8	7.6	7.6	6.8	5.7	6.9	7.8	4.6	5.9	5.5	7.3	5.4	4.7	6.8
SD	7.0	8.0	6.7	6.6	7.4	7.5	7.2	7.8	7.2	6.0	7.3	6.0	7.9	7.7	6.2	8.1
Classroom behavior problems (KPC)																
M	13.1	22.9	12.3	29.8	11.2	17.9	16.7	30.6	9.1	12.6	15.6	24.9	16.2	12.1	17.0	24.2
SD	15.1	31.6	11.6	29.3	10.5	24.1	16.7	31.4	10.8	16.3	16.4	29.2	19.2	12.3	14.2	23.8
Negative behavior (DPICS–R)																
M	−0.3	−0.4	−0.3	−0.1	−0.9	−0.9	−0.8	−0.2	−1.2	−1.2	−1.0	−0.6	−1.5	−1.2	−1.1	−1.0
SD	1.7	1.4	1.3	1.2	1.4	1.4	1.4	1.3	1.5	1.2	1.5	1.3	1.6	1.3	1.4	1.3

Note. PT + TT = parent training + teacher training condition; PT = parent training condition; TT = teacher training condition; C = waiting list control; ECBI = Eyberg Child Behavior Inventory; KPC = Kohn's Problem Checklist; DPICS–R = Dyadic Parent–Child Interactive Coding System—Revised.

ECBI Problem scores. Mean ECBI Problem scores showing the significant cubic effect are presented in Figure 5.

There were no intervention effects on the toddler's behavioral intensity based on parent-reported child scores (ECBI). This result held true for the total ECBI Intensity Scale and for the three ECBI Intensity factors proposed by Burns and Patterson (2000).

Observed negative child behavior. No intervention effects were found for the dependent variable observer-rated negative child behavior.

Classroom behavior problems. All classroom behavior problem scores were assigned to a high-risk or low-risk behavior problem group on the basis of a cut-off KPC score of 40 (one standard deviation above the sample mean). Data were then examined on the basis of the proportion of children whose classroom behavior problems (a) improved from baseline to postintervention as evidenced by movement from the high-risk to the low-risk behavior problem group, (b) worsened from baseline to postintervention as evidenced by movement from the low-risk to the high-risk behavior problem group, (c) remained in the low-risk behavior problem group across time, and (d) remained in the high-risk behavior problem group across time. To ensure sufficient cell sizes, three sets of chi-square analyses were conducted to compare (a) PT and PT + TT against the C condition, (b) TT and PT + TT against the C condition, and (c) PT + TT against TT and against PT.

From baseline to postintervention, results showed that both PT, $\chi^2(3, N = 150) = 15.62, p < .01$, and TT, $\chi^2(3, N = 147) = 30.10, p < .01$, led to significant improvements in high-risk classroom behavior problems relative to controls. However, the combined PT + TT condition was not significantly better than either PT or TT alone, $\chi^2(3, N = 145) = 5.33, p = .15$. As shown in Table 5, 44.4% of the high-risk group children in the PT condition improved (i.e., moved from the high-risk to the low-risk group) and 100% of the high-risk group children in the TT condition improved, whereas only 18.1% of the high-risk children in the control condition improved. The proportion of children in the low-risk group whose classroom behavior got worse (i.e., moved from the low-risk to the high-risk behavior problem group) was 2.2% in the PT conditions, 6.3% in the TT conditions, and 5.9% in the C condition.

Most of the sample children's classroom behavior problems improved from postintervention to the 1-year follow-up (see Table 6). However, there were significant effects for PT, $\chi^2(3, N = 124) = 14.68, p < .01$, and TT, $\chi^2(3, N = 124) = 14.44, p < .01$. When PT and TT conditions were compared with the combined PT + TT condition, children in combined PT + TT condition fared significantly worse than children in the single PT and TT conditions, $\chi^2(3, N = 121) = 8.22, p < .05$. Closer inspection of the data reveal that none of the high-risk group children in the PT + TT condition improved whereas 14.3% got worse. Thus, the hypothesis that the PT + TT condition would have more powerful effects on child behavior than either training condition alone was not supported.

Consumer Satisfaction

Parent satisfaction. Over 90% of parents rated the program as "very helpful" and 98% of parents reported that their child's behavior was "better" or "much better" than before starting the

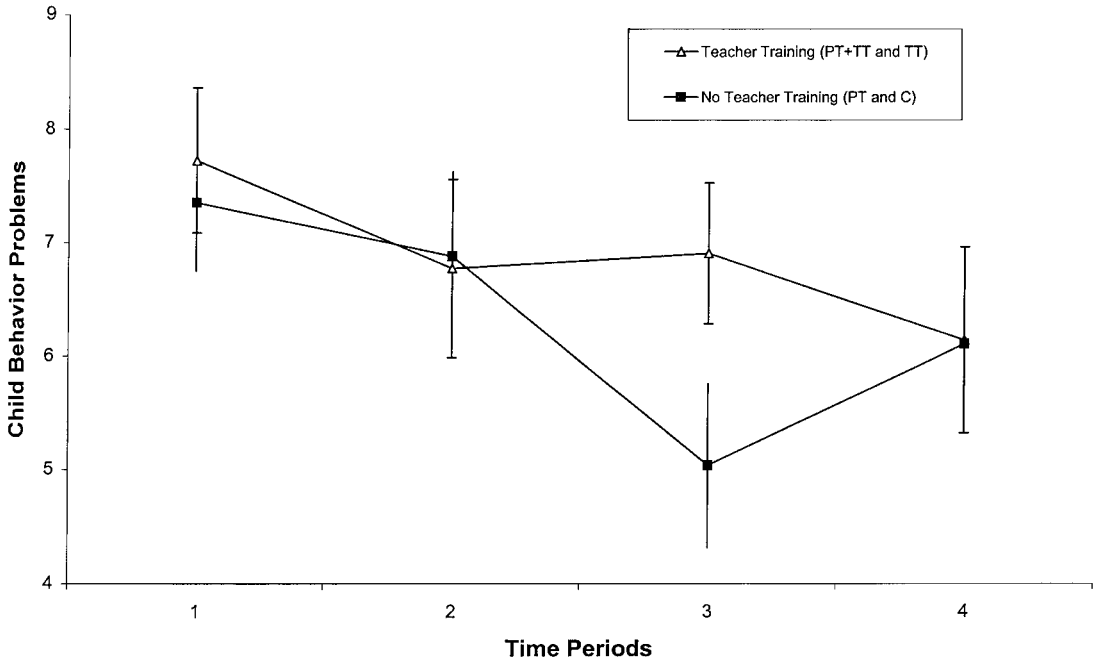

Figure 5. Mean parent-reported child behavior problems over time by training conditions. Time periods include baseline (1), postintervention (2), 6-month follow-up (3), and 1-year follow-up (4). Anchor bars indicate the standard error. C = waiting list control; TT = teacher training condition; PT = parent training condition; PT + TT = parent training + teacher training condition.

Table 5
Frequencies and Proportions of Children Changing Classroom Behavior Problem Risk Groups by Condition From Baseline to Postintervention

Risk group status	PT conditions[a]	TT conditions[b]	C condition[c]
Children at high-risk at baseline[d]	9	2	16
Children who improved	4	2	3
% improvement	44.4	100.0	18.8
Children at low-risk at baseline	91	95	34
Children whose behavior declined	2	6	2
% decline	2.2	6.3	5.9

Note. PT = parent training condition; PT + TT = parent training + teacher training condition; TT = teacher training condition; C = waiting list control.
[a] Includes children in the PT and PT + TT conditions ($n = 100$). [b] Includes children in the TT and PT + TT conditions ($n = 97$). [c] $n = 50$. We created high-risk versus low-risk classroom behavior problem scores by using a cut-off score of 40 on the Kohn's Problem Checklist. [d] There were significantly fewer high-risk children in teacher training conditions than in parent training and control conditions, $\chi^2(3, N = 186) = 25.76$, $p < .01$.

program. However, 32% of the parents reported that it was "hard" for them to attend the group-based program at their children's day care center, and 50% found it "hard" to complete the weekly homework assignments. Nonetheless, 78% of the parents rated the weekly assignments as "very helpful." Overall, 84% of the parents would "highly recommend" and 15% would "recommend" the program to a friend or relative.

Teacher satisfaction. Most of the teachers felt that the children's classroom behavior was "better" (55%) or "much better" (41%) than before they started the program. In addition, 34% felt "confident" and 59% felt "very confident" about working with parents to help them manage their children's behavior. Only 3% of the teachers found it "hard" to attend the program and "hard" to complete the weekly homework assignments. The program was rated as "very helpful" by 98% of the teachers, and 81% would "strongly recommend" the program to a friend or relative. In addition, 89% indicated that the program "helped a lot" with concerns not directly related to the children in their classrooms, such as with managing their own children's behavior at home.

Discussion

The primary objective of this study was to test the effectiveness of the Incredible Years BASIC parent program among an ethnically diverse sample of low-income parents of 2- and 3-year-old children enrolled in day care. The results of this study indicate that parents who participated in this parent training program reported significant and sustained increases in parenting self-efficacy up to 1 year postintervention. They were also observed to use more positive and less directive interactive behaviors with their toddlers than control parents, behavioral changes that were maintained through the 1-year follow-up. Parent training also led to reductions in parents' use of coercive discipline strategies, although this change was not maintained at the 1-year follow-up.

We also examined the impact on parent and child outcomes of delivering the same parent program to day care teachers. Although fewer effects were apparent from targeting the parent training program to day care teachers, teacher training did lead to reductions in parents' use of commands with their children and improvements in classroom behavior problems among high-risk children.

A clinically significant finding in this study was that parent training had a positive effect on behavior problems in the day care classroom. Over 44% of the high-risk behavior problem children in the PT and PT + TT conditions moved to the low-risk behavior problem group at postintervention. This is more than twice the rate of improvement (18.8%) found in the control group children. Although the number of children classified in the high-risk group is relatively small, it is possible that the significant improvements in parents' self-efficacy, positive interaction strategies, and use of less-coercive discipline strategies at home may have had an effect on young children's abilities to modulate their emotions and behavior in settings outside the home. Although 100% of the children classified as high risk at baseline in the TT conditions improved, enthusiasm over this result is tempered by the fact that (a) this rate of improvement is based on only 2 children, (b) there were fewer high-risk children in the TT groups at baseline, and (c) children in the TT condition had higher rates of behavioral decline (6.3%) than children in the PT conditions (2.2%).

It is possible that improvements in child behavior in the classroom may have been the result of teacher reactivity because classroom behavior was rated by teachers who had attended the intervention. However, the fact that more children in the TT conditions than in the other conditions got worse from baseline to postintervention argues against this explanation for the classroom behavior improvements. At the 1-year follow-up, most children in the high-risk classroom behavior problem groups improved regardless of intervention condition. This change most likely is due to the children's maturation.

Table 6
Frequencies and Proportions of Children Changing Classroom Behavior Problem Risk Groups by Condition From Postintervention to 1-Year Follow-Up

Risk group status	PT conditions[a]	TT conditions[b]	C condition[c]
Children at high-risk postintervention	6	6	14
Children who improved	4	4	11
% improvement	66.7	66.7	78.6
Children at low-risk postintervention	76	74	28
Children whose behavior declined	7	8	4
% decline	9.2	10.5	14.3

Note. PT + TT = parent training + teacher training condition; PT = parent training condition; TT = teacher training condition; C = waiting list control.
[a] Includes children in the PT and PT + TT conditions ($n = 82$). [b] Includes children in the TT and PT + TT conditions ($n = 82$). [c] $n = 42$. We created high-risk versus low-risk classroom behavior problem scores by using a cut-off score of 40 on the Kohn's Problem Checklist.

Contrary to our hypothesis, children in the combined PT + TT condition did not show enhanced improvements over those in the PT and TT conditions. Indeed, there was some evidence that classroom behavior problems worsened among children in the combined PT and TT condition from postintervention to the 1-year follow-up. However, further examination of the data revealed that, over time, 67% of the PT + TT high-risk group children experienced teacher turnover in their classrooms, and the replacement teachers had not received the training program. This highlights an important problem with introducing a training program in schools experiencing persistent staff turnover without also including resources for continuously offering the program to new teachers.

The lack of parent training effects on parent-reported child behavior problems and observed negative child behavior was surprising given that (a) 98% of the parents reported on their consumer satisfaction surveys that their children's behavior was "better" or "much better" than before they had started the program, (b) teachers reported significant improvements in the high-risk children's behaviors in the classroom, and (c) the parents demonstrated significant and sustained improvements on several outcomes theoretically linked to child behavior problems. Interestingly, this lack of improvement on parent reports of behavior problems is consistent with other prevention studies that have found significant changes in parent attitudes, discipline strategies, and observed parent behavior but failed to detect changes on parent reports of child behavior problems (e.g., Conduct Problems Prevention Research Group, 1999; Gross, Fogg & Tucker, 1995; Webster-Stratton, 1998).

There are several possible reasons for these findings. First, it is possible that parent training programs offered when children are very young have significant effects on parent behavior but not child behavior. Second, the methods used to assess toddler behavior problems may not have been sufficiently sensitive to detect change in children this young. Third, families of color may underreport their children's behavior problems because of differences in values or perceptions or because of concern over how those problems will be perceived by European Americans (Osterheld & Haber, 1997; Russo & Talbert-Johnson, 1997). Underreporting of behavior problems would make it difficult to detect changes on such measures. Indeed, the mean baseline ECBI Problem (M = 7.0–8.2) and Intensity scores (M = 96.9–103.4) were well within normal range and substantially lower than those for children with oppositional defiant disorder and conduct disorder (M = 17.9 and 157.1, respectively; Eyberg & Pincus, 1999).

It is possible that failure to show parent training effects for observed negative child behavior may be related to the observational methods used in this study. Webster-Stratton (1998) observed parents and their 4–5-year-old children in their homes for 30 min. In contrast, we chose to use a 15-min parent–child free-play situation to assess behavior changes because it was a developmentally appropriate situation for very young children that was presumed to capture many parent behaviors relevant to this training program's objectives. We also believed that a free-play situation would be socially acceptable to parents, thereby enhancing recruitment and retention. However, the free-play situation might not have stimulated a sufficient sample of aversive toddler behavior, yielding averages of only 9.3 (SD = 16.1) aversive child behaviors at baseline and 3.7 (SD = 8.3) aversive behaviors 1 year later. Thus, floor effects may have reduced the ability to detect a parent training effect for observed negative child behavior. A longer observation period that included more opportunities for parent–child conflict might have increased the power to detect intervention effects among children in this community sample.

Although most parents in this study were employed, the families were classified as "low-income" on the basis of annual household income and of meeting state eligibility requirements for subsidized child care. Most parents were unmarried and approximately one third were depressed. Many lived in neighborhoods where drugs, gangs, guns, and violence were major stressors. Thus, the sample was composed of parents who were not only socioeconomically disadvantaged but also living under stressful conditions. In light of previous studies showing that socioeconomic disadvantage and stress can be impediments to parent training efficacy (Dumas & Wahler, 1983; Wahler, 1980; Webster-Stratton, 1990), we sought to statistically control for these effects in our evaluation. The results indicate that although everyday stress and depression were associated with intervention outcomes, parent training was nonetheless effective in promoting more positive parenting attitudes and behaviors over the long term and reducing reliance on coercive discipline strategies over the short term.

Booster sessions were not offered to participants in this study so that the natural long-term outcomes of this 12-week intervention could be examined. This would enable us to assess the need for booster sessions and, if necessary, determine the best timing for those sessions. The data from this study indicate that booster sessions may be needed with parents from low-income communities. In particular, the parent reports of coercive discipline strategies showed noticeable backsliding that occurred between postintervention and the 6-month follow-up, suggesting that booster sessions within the first 6 months might be warranted. Perhaps the intervention's supportive group format helps parents sufficiently manage their stress so they can use the new strategies learned in the parent group. Once the intervention is over, participants may have difficulty continuing to use these new discipline strategies without the supportive influence of the parent group.

It is interesting to note that the parent and child effects obtained in this sample are similar to those obtained in a previous study of this program with middle-income, European American parents of 2-year-olds (Gross, Fogg, & Tucker, 1995; Tucker et al., 1998). In both studies, parent self-efficacy showed large positive effects from the intervention up to 1 year later. In addition, parents were observed to use more positive and less coercive behaviors with their toddlers. However, there were no significant changes in observed or parent-reported child behavior problems. These replicated results demonstrate the robustness of the findings in this study across two different urban populations of families with toddlers.

Everyday stress and depression emerged as significant correlates of parent training effectiveness for parent self-efficacy and use of coercive discipline strategies. However, neighborhood stress did not enter as a significant factor in any of the growth models. This suggests that parents may be able to separate the neighborhood context from their ability to use a parenting program, at least when their children are very young and their environments are under greater adult control. It is also possible that the parent program helps parents create safe and supportive environments for their children. For example, the group leaders worked closely with parents on how to tailor program principles to fit with

their childrearing contexts. Such techniques are important in making parent programs relevant to families from a range of cultural, socioeconomic, and neighborhood contexts.

Latino parents used less coercive discipline strategies and engaged in more positive and less directive parenting behaviors with their children than non-Latino parents (most of whom were African American). However, Latino parents also experienced less parenting self-efficacy. These findings are consistent with research that has shown that Latino parents tend to use more nurturing and permissive childrearing practices than African Americans (Garcia Coll, Meyer, & Brillon, 1995). However, the data also suggest that Latino parents may experience more anxiety about their parenting abilities, a possible explanation for the higher retention rate found among Latino parents in this study.

Contrary to our hypotheses, there was no evidence that offering the parent training program to teachers was more beneficial than offering the program only to parents. There are two possible explanations for this. First, teachers may have had difficulty generalizing the information learned in the parent program to their classrooms. Whereas Webster-Stratton et al. (2001) used a teacher training program tailored specifically to classroom management strategies in their Head Start study, this study used a program for teachers that had been originally designed for parents. This may have reduced the cross-setting consistency in child management strategies hypothesized to enhance the effects of the PT + TT condition. Second, we may have overestimated the amount of interaction that typically takes place between parents and day care teachers. Teachers from all study sites described to us parents who quickly drop their children off in the mornings on their way to work and just as quickly pick their children up in the evenings. In general, teachers commented to us that they felt unappreciated by parents who had little knowledge of what they did and of how hard they worked to foster their children's healthy growth and development. Indeed, parents in our study acknowledged that they did not know what the teachers did all day with their children. Under these circumstances, it would be difficult for parents and teachers to develop strong working relationships.

A limitation of this study is that many eligible parents in the participating centers did not enroll in the parent program. Of those who did, 30% ultimately dropped out. It is not clear whether parents who elected not to participate did so because it did not meet their needs or they could not fit it into their busy schedules. Parents who dropped out of this study did so because they lacked sufficient time, faced unanticipated changes in their work or class schedules, or experienced too much stress to continue. Among those who did remain in the parent program, 32% reported that it was "hard" to get to the parent group and 50% said it was "hard" to complete the homework assignments. Although we are accumulating evidence supporting the effectiveness of parent training with low-income families of color, future research needs to focus on effective ways for reaching and retaining more families with young children so the full benefit of this intervention can be realized. It should be noted, however, that attrition was unrelated to parent stress scores and negatively associated with coercive discipline scores. Thus, in spite of the lower than desired participation rate, those families who did attend the parent program were families in need of the program.

The findings of this study support the effectiveness of parent training with parents of color with very young children for promoting increased parenting self-efficacy and more positive parent–toddler interactions. These results are largely consistent with those reported by Gross et al. (1995; Tucker et al., 1998) with European American, middle-income families of 2-year-olds and by Webster-Stratton (1998) with families of 4–5-year-old children in Head Start. Moreover, consumer satisfaction was high and consistent with prior evaluations of this program (Webster-Stratton et al., 2001). These findings in a population that is 97% people of color (25% of whom were immigrants) have relevance given the preponderance of existing parent training research focused on European American families and the growing multicultural face of American society.

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Appendix

Model Description

On Level 1, a variable for subject j at time i was predicted by a subject-level intercept and terms representing the linear, quadratic, and cubic components of each subject's growth trend over time, along with a term representing the residual for each individual at each time point:

$$Y_{ij} = P_{0j} + P_{1j}(\text{time}) + P_{2j}(\text{time}^2) + P_{3j}(\text{time}^3) + r_{ij}$$

The Level 2 equations predicted the terms of the Level 1 equations. Each subject's intercept and slope terms were predicted by a grand mean, terms for covariates (i.e., everyday stress, depression, neighborhood problems, and ethnicity) and individual-level contrasts representing the differences between experimental conditions and controls:

$$P_{0j} = G_{00} + G_{01}(\text{stress}) + G_{02}(\text{ethnicity}) + G_{03}(\text{depression}) + G_{04}(\text{PT vs. non-PT}) + G_{05}(\text{TT vs. non-TT}) + G_{06}(\text{P + T vs. non-P + T}) + u_{0j}$$

$$P_{1j} = G_{10} + G_{11}(\text{stress}) + G_{12}(\text{ethnicity}) + G_{13}(\text{depression}) + G_{14}(\text{PT vs. non-PT }) + G_{15}(\text{TT vs. non-TT }) + G_{16}(\text{P + T vs. non-P + T}) + u_{1j}$$

$$P_{2j} = G_{20} + G_{21}(\text{stress}) + G_{22}(\text{ethnicity}) + G_{23}(\text{depression}) + G_{24}(\text{PT vs. non-PT }) + G_{25}(\text{TT vs. non-TT}) + G_{26}(\text{P + T vs. non-P + T}) + u_{2j}$$

$$P_{3j} = G_{30} + G_{31}(\text{stress}) + G_{32}(\text{ethnicity}) + G_{33}(\text{depression}) + G_{34}(\text{PT vs. non-PT }) + G_{35}(\text{TT vs. non-TT}) + G_{36}(\text{P + T vs. non-P + T}) + u_{3j}$$

Received July 3, 2001
Revision received March 15, 2002
Accepted March 26, 2002 ■