

Randomized Trial of a Family-Centered Approach to the Prevention of Early Conduct Problems: 2-Year Effects of the Family Check-Up in Early Childhood

Daniel S. Shaw
University of Pittsburgh

Thomas J. Dishion
University of Oregon

Lauren Supplee
University of Pittsburgh

Frances Gardner
University of Oxford

Karin Arnds
University of Pittsburgh

Despite recent research indicating that 1 of the pivotal times for identifying pathways to early conduct problems is the toddler period, few family-based preventive interventions have been specifically designed to modify child disruptive behavior during this age period. This randomized trial tested the effectiveness of the Family Check-Up in sustaining maternal involvement and preventing the exacerbation of child conduct problems among 120 at-risk toddler-age boys, half of whom were randomly assigned to a treatment condition. The intervention was associated with reductions in disruptive behavior and greater maternal involvement and was particularly effective for children at greater risk for a persistent trajectory of conduct problems. The results are discussed in relation to other preventive interventions for young children.

Keywords: child externalizing problems, preventive interventions, parenting, early childhood, parent training

Recent consideration of developmental trends in the onset of antisocial behavior has been focused on early starter pathways (Moffitt, Caspi, Harrington, & Milne, 2002; Patterson, Reid, & Dishion, 1992). Individuals with this developmental pathway have been found to show a persistent and chronic trajectory of antisocial behavior extending from early childhood to adulthood (Moffitt et al., 2002). Whereas previous studies were initiated during the preschool and school-age periods (Campbell, Pierce, Moore, Marakovitz, & Newby, 1996), during the past decade predictors of early starter pathways have been established beginning at ages 1.5–2 (Aguilar, Sroufe, Egeland, & Carlson, 2000; Shaw, Gilliom, Ingoldsby, & Nagin, 2003). Longitudinal studies initiated during the toddler and early preschool periods have identified a group of early starter children who go on to show the most chronic and severe forms of antisocial behavior (Aguilar et al., 2000; Moffitt et

al., 2002). Early starters represent approximately 6% of the population but are responsible for almost half of adolescent crime and three fourths of violent crimes (Offord, Boyle, & Racine, 1991). Results from longitudinal studies tracing the development of antisocial pathways indicate that child (e.g., male status), family (e.g., rejecting parenting), and sociodemographic (e.g., poverty) factors all play an important role in its early origins (Aguilar et al., 2000).

The Importance of Family-Based Interventions

The centrality of family in general and parenting in particular suggests that interventions that focus on the family would be effective in preventing the early starting pathway. The last three decades have also seen an increase in the number of interventions developed for working with children and adolescents with conduct problems (CP; e.g., Dishion & Kavanagh, 2003; Henggeler, Melton, & Smith, 1992). As discussed by Spoth, Kavanagh, and Dishion (2002), there are a variety of issues that affect the viability of family interventions as a prevention strategy. One is the need to embed such interventions within service settings that have contact with a large proportion of children at risk for maladaptive adjustment. The second is to focus on key developmental transitions that are opportunities for engaging parents to prevent pathogenic family dynamics and processes. A prime example of these two strategies is the work of Olds (2002) and Baydar, Reid, and Webster-Stratton (2003). The Olds model engages mothers during

Daniel S. Shaw, Lauren Supplee, and Karin Arnds, Department of Psychology, University of Pittsburgh; Thomas J. Dishion, Child and Family Center, University of Oregon; Frances Gardner, Department of Social Policy and Social Work, University of Oxford, Oxford, England.

This research was supported by National Institute of Mental Health Grant MH06291 and National Institute on Drug Abuse Grant DA016110.

Correspondence concerning this article should be addressed to Daniel S. Shaw, Department of Psychology, University of Pittsburgh, 210 South Bouquet Street, 4103 SENSQ, Pittsburgh, PA 15260. E-mail: casey@pitt.edu

pregnancy and infancy to promote maternal health and the quality of the infant–parent relationship. Webster-Stratton and colleagues' (Baydor et al., 2003) model has been applied within the Head Start preschool system, one in which parents already have extensive contact. In the context of Head Start, parents are provided with empirically supported parent groups that reduce the level of preschooler problem behavior.

To date, family-centered intervention programs specifically designed to prevent CP among toddlers have been lacking, in part because of the limited contexts for identifying very young children at risk for maladaptive outcomes. One service setting relevant for families with young children is the Women, Infant, and Children (WIC) Nutritional Supplement Program, a federally funded health service site for income-eligible families with children ages 0 to 5. To address the dearth of family-based intervention programs for at-risk toddlers, we used the WIC program as the source of participant recruitment in the current study.

The Toddler Years as a Period of Transition for Children and Parents

In the past two decades, many prevention efforts have been targeted at developmentally salient transitions to address the challenges associated with these periods for children and caregivers. Examples of successful preventive interventions of this type include Olds's (2002) Nurse–Family Partnership for first-time parents with newborns; Webster-Stratton and colleagues' (Baydar et al., 2003) Incredible Years Program for children approaching formal school entry; and Dishion and Kavanagh's (2003) Family Check-Up (FCU), previously applied to adolescent populations. The toddler years represent a time of marked change for children in terms of cognitive, emotional, and physical maturation. Despite growth in all of these areas, children's developing cognitive abilities are not well matched to the challenges afforded by their newfound physical mobility. Their new mobility permits children to ambulate quickly but without the cognitive appreciation to anticipate the consequences of violating other's personal space, understanding the principles of electricity or gravity, or considering the potential hazards of straying too far from caregivers in novel settings (e.g., shopping malls). Thus, toddlers require proactive involvement and monitoring to literally keep them out of harm's way (Gardner, Sonuga-Barke, & Sayal, 1999). For parents dealing with this transformation (Shaw, Bell, & Gilliom, 2000), the nature of the parent–child relationship changes from a focus on responsivity and sensitivity to the immobile infant's emotional needs to monitoring a mobile and naive toddler. As a result, parental pleasure in child rearing has been shown to decrease from the 1st to 2nd years (Fagot & Kavanagh, 1993). How caregivers respond to these changes and how involved they are during this period have been shown to have important repercussions for early CP (Gardner et al., 1999; Shaw et al., 2000, 2003), as the course of CP has been shown to be moderated by controlling, uninvolved, and rejecting parenting (Aguilar et al., 2000; Campbell et al., 1996). Preventive interventions that can demonstrate changes in parental involvement, responsiveness, or rejecting behavior have the potential to modify trajectories of child CP. Therefore, the purpose of the current study was to examine the efficacy of a family-centered intervention designed to motivate parents to promote more consistent parent management practices and increase

their involvement in caregiving. To assess the viability of this approach, we selected 120 families participating in the WIC service system who were deemed as at risk for showing early starting pathways of CP, half of whom were randomly assigned to the intervention condition. Follow-up results on dimensions of parenting and child CP were available from observations and parent report 1 and 2 years after initial contact.

Barriers to Family Interventions and the FCU

One of the barriers to implementing family interventions within service settings is parent motivation. Many of the efficacy and effectiveness trials that form the backbone of our empirical literature are based on high levels of funding for both the research component and the families' participation. For example, Dishion, Andrews, Kavanagh, and Soberman (1996) developed the Adolescent Transitions Program, which comprised 12 parent group sessions that emphasized family management practices. Within the context of a clinical trial, the intervention reduced observed coercive parent–adolescent interactions and decreased antisocial behavior and subsequent substance use (Dishion et al., 1996). However, in implementing the program outside the context of a well-funded intervention trial, parent participation was difficult to obtain, and dependence on parent groups as the exclusive delivery format was deemed impractical. Stormshak and Dishion (2002) also reported difficulty in relying exclusively on parent groups with a set format and agenda as a barrier to changing parenting practices.

The problem is that many family-centered interventions do not explicitly target the parents' motivation to change. Parent resistance to change has been programmatically studied by Patterson and Chamberlain (1994). In general, therapist training in developing collaborative relationships with parents and working through motivation issues in therapy is a key to the change of parenting practices. Miller and Rollnick (2002) have developed the technique of motivational interviewing to encapsulate the therapist–client dynamics that are most likely to result in productive change. For example, in the field of alcohol misuse, the Drinkers Check-Up is a direct application of motivational interviewing designed to promote change in adults who drink heavily (Miller & Rollnick, 2002). Two of the key strategies of the Drinker's Check-Up are to use assessment data in a feedback interview to elicit interactions between the client and therapist that influence change and to provide a flexible menu of change strategies for the client to select to achieve reductions in drinking. Several studies have revealed that random assignment to the brief Drinkers Check-Up was as effective as 28 days of costly inpatient treatment for reducing problem drinking in adults (Miller & Rollnick, 2002).

The FCU was directly inspired by the work of Miller and Rollnick (2002) on motivational interviewing. The FCU is a brief intervention that contains a broad assessment of the family context and parenting practices, an initial "get-to-know-you" (GTKY) meeting with the family, and a formal feedback session. We see the FCU as the foundation of an ecological approach to child and family interventions, the first step in a menu of empirically supported child and family interventions that reduce problem behavior and promote emotional well-being in children and families. In contrast to the standard clinical model, the ecological approach is seen as a health maintenance model, which explicitly promotes

periodic contact with families (at a minimum yearly) over the course of key developmental transitions. The current study focuses primarily on the FCU for families and toddlers at risk for early CP who were engaged in the WIC service system.

Previous research with the FCU has involved random assignment of young adolescents in public middle schools to a family resource room in contrast to a “middle school as usual” control condition. The family resource rooms were staffed by trained personnel focused on engaging families in the FCU and a variety of other linked family interventions (see Dishion & Kavanagh, 2003). Using an intention-to-treat design, the authors found that proactive parent engagement reduced substance use among high-risk adolescents and prevented substance use among typically developing youth (Dishion, Kavanagh, Schneiger, Nelson, & Kaufman, 2002). Significant reductions in these problem behaviors resulted from, on average, six direct contact meetings with parents over the course of 3 years. The FCU was the key intervention strategy that was repeated for many parents annually.

In our application of the FCU to families of toddlers, we revised the assessment battery to focus on key development processes for families with toddlers, including those challenges within and outside the family that may compromise parenting and child adjustment. Thus, although we emphasized parental management strategies in the context of the child’s increasing physical autonomy, other issues that could influence family well-being were also addressed, including parental depression, social support, marital quality, day care, employment, and housing concerns. Feedback was provided by using motivational interviewing practices. Some families, if desired, were provided with additional support on managing child behavior and family context issues.

How Risk Factors Moderate Treatment Effects

The field of developmental psychopathology in general and longitudinal research on the antecedents of children’s CP in particular have documented the increased risk of the onset and persistence of maladaptive child outcomes in the context of risk factors across sociodemographic, family, and child domains (Ackerman, Schoff, Levinson, Youngstrom, & Izard, 1999; Deater-Deckard, Dodge, Bates, & Pettit, 1998). In one such study that traced early trajectories of CP from ages 2 to 8, consistent with a multiple adversity perspective, factors that discriminated high and low trajectory groups at age 2 were from family and child domains: high maternal depressive symptoms and low child inhibition (Shaw et al., 2003). In evaluating the effectiveness of preventive interventions for toddlers, it would be important to know whether the intervention was successful in modifying the trajectories of toddlers with such risk profiles. Thus, another goal was to see whether families characterized by high maternal depressive symptoms and low child inhibition showed dissimilar outcomes by age 4 on child CP as a function of intervention group status.

Goals of Current Study

On the basis of the limited number of intervention studies designed to specifically address the challenges of the toddler period by using samples of children at high risk for early starting CP, the present study was designed to examine the effectiveness of the FCU in sustaining maternal involvement. A second goal was to

examine whether the intervention was successful in reducing child CP, by using an intention-to-treat design. Third, we examined whether families in the intervention condition with a risk profile associated with a trajectory of early CP—namely, high maternal depressive symptoms and low child inhibition—showed reductions in child CP compared with control families with the same risk factors.

Method

Participants

Participants included 120 mother–son dyads recruited in 2001 from the WIC program in the Pittsburgh, Pennsylvania, metropolitan area. Families were approached at WIC sites and invited to participate if they had a son between 17 and 27 months old, following screening to ensure that they met the study criteria by having socioeconomic, family, and/or child risk factors for future behavior problems. Two or more of the three risk factors were required for inclusion in the sample (see *Recruitment* below). Of the 327 mothers who were approached at WIC sites, 271 (83%) agreed to participate in the initial screen. Of these families, 124 families met the eligibility requirements, and 120 (97%) agreed to participate. The children in the sample had a mean age of 24.1 months ($SD = 2.8$). At the time of assessment, the mean age of mothers was 27.2 years ($SD = 6.1$, range = 18 to 45 years). The average family income was \$15,374 per year ($SD = 8,754$), with a per capita income of \$3,594 ($SD = 2,076$) per family member. The average number of family members per household was 4.49 ($SD = 1.53$). The mean level of educational attainment for mothers was 12.23 years ($SD = 1.41$), with 66.6% of the sample having a high school education or less. In terms of ethnicity, 48.3% were African American (AA), 40.0% were Caucasian, and 11.7% were biracial. At the time of the initial assessment, 45% were married or living with a partner; 50% were single and never married; and 5% were separated, divorced, or widowed.

Of the 120 families who initially participated, 112 (93.3%) were available at the 1-year follow-up assessment when children were approximately age 3, and 109 (90.8%) participated at age 4. At age 4, no differences were found in the number of participants who were not retained in the control ($n = 4$) versus intervention ($n = 7$) groups.

Measures

Demographics questionnaire. A demographics questionnaire was administered to the mothers during the age 2, 3, and 4 visits. This measure included questions about family structure, parental education and income, parental criminal history, and areas of familial stress.

Beck Depression Inventory (BDI). The BDI (Beck, Steer, & Garbin, 1988) is a well-established and widely used measure of depressive states that was administered to mothers at the age 2 home assessment. Split-half reliability of the scale has been found to be high (.86 to .93).

Child inhibition. At the age 2 home assessment, child inhibition was coded on the basis of the child’s reactions to an approach by an adult stranger (2 min) and two novel objects (2 min each): a tunnel and a mechanically operated robot. On the basis of a system developed by Kochanska (1991), the following behaviors were rated by coders in 30-s intervals: approach and proximity to mother, avoidance or wary response to examiner, examining or playing with free-play toys, and approach to novel objects. In addition, coders assigned one global rating for the child’s level of inhibition. Coders scored 20% of the tapes as a team, and interrater reliability kappa coefficients ranged between .68 and .83. Using a factor structure derived by Shaw et al. (2003), we standardized and summed each item to generate a total score for inhibition. As higher scores indicated greater inhibitory behavior, some items were reverse scored (e.g., exam-

ining or playing with free-play toys and approach to novel objects). Internal consistency for the Inhibition factor in the present sample was .63.

Primary outcome measure: Child Behavior Check List (CBCL) 2–3 and 4–18. The CBCL (Achenbach, 1991, 1992) is a questionnaire that assesses behavioral problems in young children. Mothers completed the CBCL at the ages 2, 3, and 4 visits. Both versions of the questionnaire have two broadband scales, Internalizing and Externalizing, and narrow-band scales, including destructive and aggressive behavior for the 2–3 version. As we were interested in examining whether specific types of externalizing clusters were amenable to intervention, we focused on the two narrow-band scales from the 2–3 version: Destructive and Aggression. As some of these items were not included in the age 4–18 version of the CBCL, to approximate the use of the same constructs, at age 4 we used items from the age 4–18 version that were included on the age 2–3 versions of the Destructive and Aggression Scales (i.e., 11 of 15 items for Aggression and 10 of 15 items for Destructive). In some cases, the versions of the items were more broadly defined (e.g., happens at home and school), but items were retained only if the same type of behavior was listed for both versions of the scale. Internal consistency for the Aggression Scale was .82 at age 2, .84 at age 3, and .86 at age 4. For the Destructive Scale, alphas were .60, .71, and .73, at ages 2, 3, and 4, respectively.

Secondary outcome measure: Home Observation for Measurement of the Environment (HOME). HOME (Caldwell & Bradley, 1984) is a measure of the quality of the home environment that was completed by a trained examiner at each home visit. Examiners were blind to the family's treatment group status. For the present study, only items that could be observed were used (i.e., 21 of 45), including 3 items from the 6-item Involvement Scale: (a) parent keeps child in visual range, (b) parent talks to child while doing housework, and (c) parent structures child's play (alphas = .53, .56, and .68 at ages 2, 3, and 4, respectively). Each of the items is scored on the basis of being absent (0) or present (1), with the final score equaling the sum of the 3 items. Items were selected to provide an independent assessment of monitoring of the child's behavior.

Procedure

Recruitment. Mothers and their sons were approached at eight WIC sites in the Pittsburgh metropolitan area and asked whether they would be willing to complete a series of questionnaires about the "terrible twos." The questionnaires were focused on the child's disruptive behavior and emotionality, parenting hassles, and maternal depression and took 20–25 min to complete. Participants who completed this screen received \$10. Families who met criterion for study inclusion, based on socioeconomic status and family and/or child risk (e.g., maternal depression or substance abuse; child CP), were contacted about participating in a more intensive study, of which 50% would have the opportunity to take part in a home-based family intervention (see Figure 1). If risk criteria were attained for only socioeconomic and family risk, children needed to be above the normative mean on either the Intensity ($M = 98$) or Problem ($M = 7$) Scales of the Eyberg Behavior Inventory (Robinson, Eyberg, & Ross, 1980), to increase the probability that parents would desire assistance in this area. In evaluating the success of random assignment, no significant differences were found between intervention and control families at age 2 on the three CBCL scales, the BDI, the HOME Involvement Scale, or any sociodemographic factors.

Assessment. Parents (i.e., mothers and, if available, alternative caregivers, such as fathers or grandmothers) and sons 1.75 to 2.5 years of age who met eligibility requirements and who agreed to participate in the study were then scheduled for a 2.5-hr home visit. Each assessment began by introducing the boys to an assortment of age-appropriate toys and having them play for 15 min while the mothers completed questionnaires. After the free play (15 min), which began with the child being approached by an adult stranger (i.e., undergraduate filmer), mothers and sons participated in a clean-up task (5 min), followed by a delay-of-gratification task (5 min), three teaching tasks (3 min each), a second clean-up task (4 min), the

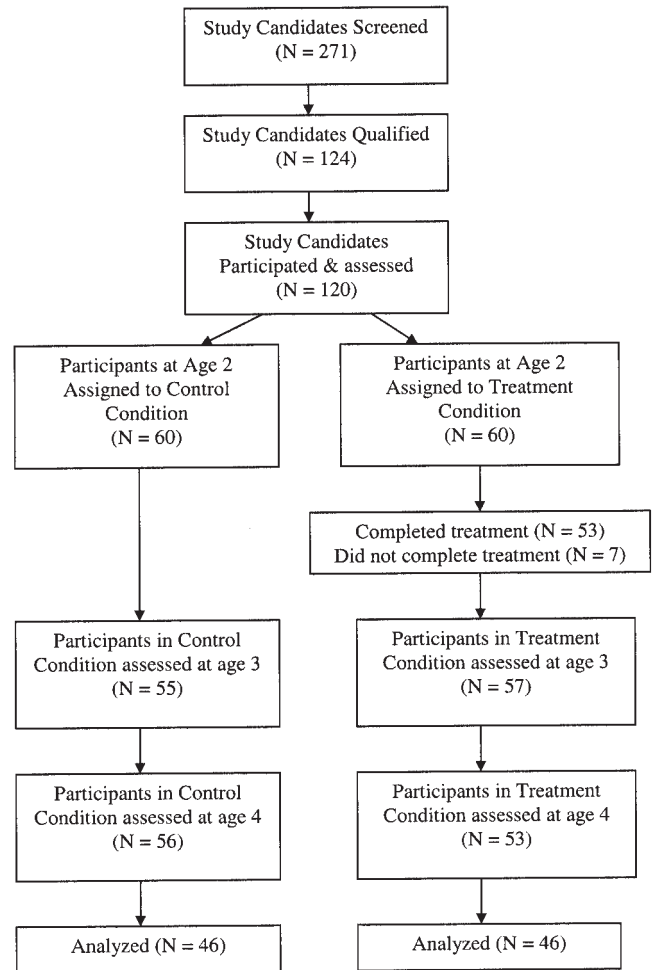


Figure 1. Flowchart showing progression of participants through study.

presentation of two inhibition-inducing toys (2 min each), and a meal preparation and lunch task (20 min). During the second half of the visit, mothers completed the Five Minute Speech Sample (5 min; Magana, Goldstein, Karno, Miklowitz, & Falloon, 1986) and a series of questionnaires (1.25 hr). Families received \$100 for participating in this home visit. The randomization sequence was computer generated by a member of staff who was not involved with recruitment. No methods were used for restricting randomization. To ensure blindness, the examiner opened a sealed envelope, revealing the family's group assignment only after the assessment was completed, and shared this information with the family. Families randomly assigned to the intervention condition were then scheduled to meet with a parent consultant for two or more sessions depending on the family's preference. Examiners carrying out follow-up assessments were blind to allocation.

Twelve and 24 months after the initial visit, when children were approximately 3 and 4 years of age, respectively, families in both intervention and control conditions participated in follow-up home assessments. Control families accessed the same WIC services as the intervention group but received no visits or intervention from parent consultants. These assessments were very similar in structure and measures used to the initial home assessment, with a few alterations in the observation procedures to match the child's developmental status. For purposes of the present study, only maternal reports of child externalizing problems and observer reports of parenting were used from the age 3 and 4 assessments. Families were reimbursed \$125 for their time at both assessments.

Intervention protocol: The FCU. All families randomly assigned to the intervention group were offered the FCU following their assessment in the home. The FCU is a brief three-session intervention based on motivational interviewing and modeled after the Drinker's Check-Up (Miller & Rollnick, 2002). Typically, the three meetings include an initial contact session, an assessment session, and a feedback session (Dishion & Kavanagh, 2003). However, to optimize the internal validity of the study (i.e., prevent differential dropout for experimental and control conditions), the assessments were completed before random assignment results were known to either the research staff or family. Thus, for the purpose of this pilot study, the sequence of contacts was an assessment (baseline), randomization, an initial interview, a feedback session, and possibly follow-up sessions. Families were paid \$25 for completing the FCU at the end of the feedback session.

Thus, in the present study, the initial meeting was an assessment conducted with research staff, as described above, where the family engaged in a variety of in-home videotaped tasks of parent-child interaction and caregivers completed several questionnaires about their own, their child's, and their family's functioning. During this home assessment, staff also completed ratings of parent involvement and supervision. The second session was a GTKY meeting with the parent consultant, during which time she explored parent concerns, focusing on family issues that were currently the most critical to the child's well-being. The third meeting involved a feedback session, where the parent consultant summarized the results of the assessment by using motivational interviewing strategies. An essential objective of the feedback session was to explore the parents' willingness to change problematic parenting practices, to support existing parenting strengths, and to identify services appropriate to the family needs. At the feedback, the parent was offered a maximum of six further follow-up sessions that were focused on parenting practices, other family management issues (e.g., coparenting), and contextual issues (e.g., child care resources, marital adjustment, housing, and vocational training).

Parent consultants who completed the FCU and follow-up parenting sessions were two master's-level therapists, one of whom was a professional who had 5 years of practice working with families. The second therapist had recently received a master's in social work and had no formal training in family or behavior therapy. Parent consultants were initially trained for 2.5–3 months by using a combination of strategies (by Thomas

J. Dishion and Daniel S. Shaw), including didactic instruction, and role playing, followed up by ongoing videotaped supervision of intervention activity. Weekly videoconferencing was used to link one of the investigators (Thomas J. Dishion) with the parent consultants that involved strategic discussion of problematic cases. Parent consultants followed a written manual and used a book by Dishion and Patterson (1996) to guide parenting support services following the FCU session.

Of the 60 families assigned to the treatment condition, 55 families (91.7%) participated in the GTKY and feedback sessions. Of those families who met with a parent consultant, the average number of sessions per family was 3.26 ($SD = 2.34$), including the GTKY and feedback as two of those sessions. The number of sessions was not related to any of the three CBCL-based scales of disruptive problem behavior at ages 3 or 4.

Results

The overall goals of the study were to determine whether the intervention was effective, by using an intention-to-treat design, in modifying levels of maternal involvement in parenting and in reducing different types of child disruptive behavior. In addition, we examined whether the intervention was differentially effective for children with a high-risk profile of low inhibitory control and high maternal depression. Given the relatively small sample size and the specific nature of the hypotheses in regard to the direction of effects, one-tailed tests were used to establish statistical significance. We also examined differences in levels of HOME Involvement and CBCL scales by ethnicity, for which one significant difference was evident: Caucasian mothers showed higher involvement at age 2 ($M = 2.25$, $SD = 0.84$) than did AA mothers ($M = 1.48$, $SD = 1.10$), $F(1, 111) = 17.46$, $p < .001$. Thus, ethnicity was included as a covariate in analyses involving the HOME factor.

Descriptive statistics are provided in Table 1 by intervention group status for measures of maternal depressive symptoms (BDI) at age 2 and for the HOME Involvement factor and the three CBCL-based scales of child disruptive behavior at ages 2, 3, and

Table 1
Descriptive Statistics for Pre-Post Scores by Treatment Group of Child Inhibition, Child Disruptive Behavior Scales, Maternal Depression, and Maternal Involvement

Variable	Intervention		Control	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Mat. depress. symptoms, Age 2	12.21	10.59	11.73	7.84
Child inhibition, Age 2	-0.05	0.33	0.05	0.48
CBCL Destructive, Age 2	3.72	1.71	3.63	2.24
CBCL Destructive, Age 3	2.66	1.82	3.21	1.92
CBCL Destructive Rev., Age 4	1.87	1.87	2.27	2.44
CBCL Aggression, Age 2	9.70	4.13	9.11	3.65
CBCL Aggression, Age 3	9.85	4.04	8.93	4.41
CBCL Agg. Rev., Age 4	6.96	4.76	7.20	4.90
CBCL Physical Agg., Age 2	1.07	1.10	0.78	0.89
CBCL Physical Agg., Age 3	0.96	1.07	0.67	1.05
CBCL Physical Agg., Age 4	0.65	0.95	0.78	1.11
HOME Involvement, Age 2	1.80	1.07	1.81	0.98
HOME Involvement, Age 3	2.00	1.06	1.72	1.03
HOME Involvement, Age 4	2.05	1.10	1.49	1.16

Note. Mat. depress. = maternal depression; CBCL = Child Behavior Checklist; CBCL Destructive Rev. = revised version of the Destructive Scale of the CBCL; CBCL Agg. Rev. = revised version of the Aggression Scale of the CBCL; Agg. = Aggression Scale; HOME = Home Observation for Measurement of the Environment.

4. As expected, the mean level of depressive symptoms demonstrated by mothers at age 2 ($M = 11.98$, $SD = 9.31$) was in the mild to moderate range (Beck & Beamsderfer, 1974) and just below the cutoff point of 13 recommended to detect depression among psychiatric patients. T scores on the CBCL Aggression and Destructive Scales were approximately one standard deviation above the normative average at age 2 (Achenbach, 1992).

Treatment Effects on Sustaining Maternal Involvement

Our first goal was to examine whether levels of maternal involvement differed over time as a function of intervention group assignment. A two-way repeated measures analysis of covariance was computed in which the dependent variable was the Involvement factor assessed at ages 2, 3, and 4; the two factors were time and intervention group; and ethnicity (AA vs. Caucasian status) was used as a covariate. After accounting for the effects of ethnicity, the main effect for time was nonsignificant, $F(2, 83) = 0.23$, ns , but there was a main effect for treatment, $F(1, 83) = 4.91$, $p < .05$, and a nonsignificant interaction for Time \times Treatment, $F(2, 83) = 0.26$, ns . As displayed in Figure 2, the main effect for treatment was based on significant change in involvement between groups from age 2 to age 4. Those in the intervention group ($\Delta M = -0.22$, $SD = 1.53$) showed significantly higher scores at age 4 than did those in the control group ($\Delta M = 0.30$, $SD = 1.28$) after controlling for scores at age 2, $F(1, 92) = 3.09$, $p < .05$. Involvement levels increased from ages 2 to 3 for intervention mothers and remained the same at age 4, whereas for control families maternal involvement decreased from ages 2 to 4.

Treatment Effects on Child Disruptive Behavior

We next examined group differences with respect to the CBCL Aggression and Destructive Scales. As some items of the Aggression and Destructive Scales were not administered at age 4, scores were standardized across ages to increase comparability. Using standard scores for Aggression and Destructive, we computed a series of two-way repeated measures analyses of variance with the two factors being time and intervention group. For Aggression, the main effect for time, $F(2, 88) = 0.03$, ns , and treatment, $F(1, 88) = 0.01$, ns , were nonsignificant, as was the interaction between time and treatment, $F(2, 88) = 0.20$, ns . For the Destructive Scale, there

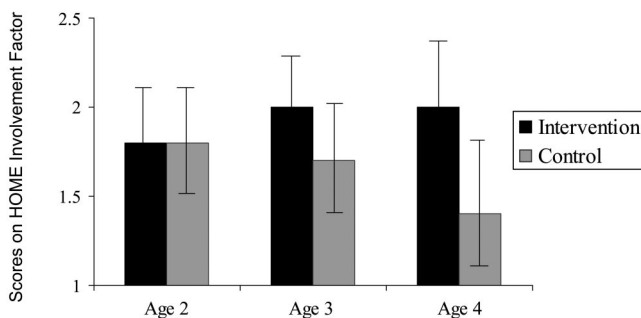


Figure 2. Intervention and control group scores on the Home Observation for Measurement of the Environment (HOME) Involvement Scale from ages 2 to 4. Effect size at age 3 = .30 standard deviations; effect size at age 4 = .48 standard deviations. Error bars represent 95% confidence intervals.

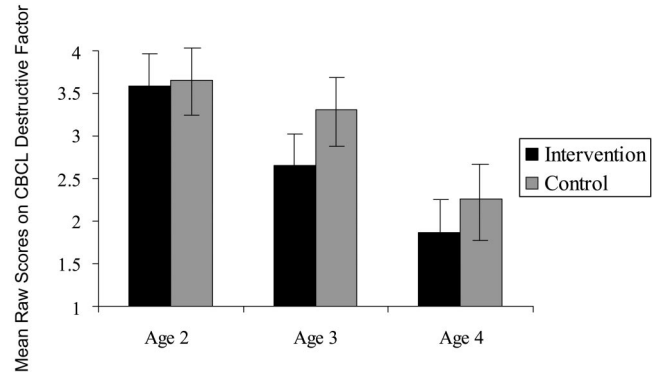


Figure 3. Intervention and control group scores on the Child Behavior Check List (CBCL) Destructive Scale from ages 2 to 4. Effect size at age 3 = .64 standard deviations; effect size at age 4 = .45 standard deviations. Error bars represent 95% confidence intervals.

was no main effect for time, $F(2, 88) = 0.16$, ns , or treatment, $F(1, 88) = 0.27$, ns , but there was a significant Time \times Treatment interaction, $F(2, 88) = 3.10$, $p < .05$. As displayed in Figure 3, the significant Time \times Treatment interaction was based primarily on changes that occurred between ages 2 and 3, when those in the intervention group ($\Delta M = 2.44$, $SD = 3.11$) showed a significant decrease compared with those in the control group ($\Delta M = 0.75$, $SD = 3.20$), $F(1, 108) = 7.81$, $p < .01$. The difference in scores between groups at age 3 was moderate ($d = .64$ standard deviations), a trend that continued to be evident, albeit to a lesser degree, at age 4 ($d = .45$ standard deviations).

Treatment Effects With Children at Extreme Risk for Continued CP

Our third goal was to examine how children with an extreme-risk profile for persistent CP, as indicated by low levels of child inhibition and high levels of maternal depressive symptoms, would respond to the intervention compared with children with fewer risk factors. As recommended by Jaccard, Turrisi, and Wan (1990), hierarchical regressions were used to examine potential moderating effects, in which the age 4 versions of the Aggression and Destructive Scales were used as dependent variables. For each regression equation, entry for independent variables followed the same order: treatment group status, maternal depressive symptoms, child inhibition, the three 2-way interactions, and the one 3-way interaction. We were interested to see how children in the intervention group would compare with controls in the context of high maternal depression, low child inhibition, or both risk factors.

As displayed in Table 2, the overall equation was significant for both Aggression, $F(7, 84) = 2.53$, $p < .05$, $R^2 = .17$, and Destructive, $F(7, 85) = 3.07$, $p < .01$, $R^2 = .14$. Of particular interest were the two 2-way and the one 3-way interactions involving treatment group status and either or both child inhibition and maternal depression. For Destructive, significant 2-way interactions were evident between treatment and maternal depression and between treatment and child inhibition. These were explored and interpreted by using procedures described in Jaccard et al. (1990). Specifically, the association between treatment status group and destructive problems was examined in separate analyses

Table 2
Treatment Group Assignment and Maternal Depressive Symptoms and Child Inhibition at Age 2 in Predicting Age 4 Externalizing Outcomes ($N = 91$)

Variable	Aggression			Destructive			Physical aggression		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
Treatment	0.27	1.62	.03	0.73	0.72	.17	-0.22	0.36	-.11
Beck	0.06	0.09	.12	0.08	0.04	.33*	0.00	0.02	-.00
Inhibition	3.5	2.78	.29	0.04	1.23	.01	0.41	0.61	.16
Beck \times Inhibition	-0.38	0.22	-.37	-0.12	0.10	-.25	-0.07	0.05	-.32
Treatment \times Beck	-0.04	0.11	-.07	-0.11	0.05	-.46*	0.01	0.03	.06
Treatment \times Inhibition	7.14	4.34	.37	4.16	1.92	.47*	1.46	0.96	.35
Treatment \times Beck \times Inhibition	-0.15	0.41	-.08	-0.18	0.18	-.20	-0.06	0.09	-.14

Note. Child Behavior Checklist (CBCL) Aggression (revised): $F(7, 84) = 2.529, p < .05$, adjusted $R^2 = .14$. CBCL Destructive (revised): $F(7, 85) = 3.07, p < .01$, adjusted $R^2 = .14$. CBCL Fights: $F(7, 84) = 1.459, ns$, adjusted $R^2 = .11$. Beck = Beck Depression Inventory.
* $p < .05$.

at three levels of maternal depressive symptoms and three levels of child inhibition (low = -1 standard deviations, medium = M , high = +1 standard deviations). Examination of the slopes indicated that the treatment condition was associated with lower levels of destructive behavior at high and average levels of maternal depressive symptoms (high slope = -1.67, $p < .001$; average slope = -0.47, $p < .001$), but that scores for Destructive were significantly higher for treatment than for control children when maternal depressive symptoms were initially low (low slope = 0.73, $p < .05$).

For the interaction involving treatment group status and child inhibition, the slopes indicated that treatment was associated with lower levels of Destructive Scale scores at mean and low levels of child inhibition (mean slope = -0.39, $p < .05$; low slope = -1.61, $p < .001$). Although the beta for the 3-way interaction involving treatment group, maternal depression, and inhibition was not significant, because of the nature of the two 2-way interactions involving treatment and one of the other variables (i.e., treatment was more effective when either the parent or child risk factor was evident), we also examined whether destructive problems varied in the context of maternal depression, child inhibition, and treatment group status. The slopes for destructive problems were found to vary by treatment group at low levels of inhibition with average levels of maternal depression (slope = -1.40, $p < .05$) and at average levels of inhibition with high levels of maternal depression (slope = -1.53, $p < .05$). As displayed in Figure 4, treatment children with both risk factors showed a marked decline in Destructive Scale scores compared with controls.

Discussion

The results of the study provide preliminary support for the efficacy of the FCU for young children at risk for early starting CP. First, as a result of random assignment to the intervention group, mothers showed increases in involvement in child behavior from ages 2 to 4 compared with reductions for those in the control condition. Significant decreases on the CBCL Destructive Scale were found at age 3 for boys in the intervention group compared with controls. In addition, despite the brief number of sessions parent consultants had with families ($M = 3.26$), the intervention was effective in reducing destructive behavior for children with

initially high levels of inhibition and maternal depressed mood, a profile associated with persistence of early CP in previous research (Shaw et al., 2003) and among control families in the current study.

Promoting Maternal Involvement

Changes in caregiving practices are a central tenet of most family-based interventions addressing externalizing problem behavior (e.g., Dishion & Kavanagh, 2003), and this has been especially true for projects focusing on young children (Baydar et al., 2003; Olds, 2002). Thus, we anticipated that a critical step in the process of change would be to increase maternal levels of involvement, particularly in the context of the "terrible twos," when many parents show greater frustration and may demonstrate less involvement in response to increases in child disruptive behavior. In fact, consistent with this premise, those mothers in the control group showed gradual reductions in their level of involvement with children at ages 3 and 4, whereas those in the intervention group increased their involvement with children at age 3 and maintained this level at age 4. Although group differences in involvement were not significantly different until age 4, prohibiting the testing of potential mediational effects of involvement on child destructive behavior, the results are consistent with the notion that changes in child behavior are accompanied by improvements in

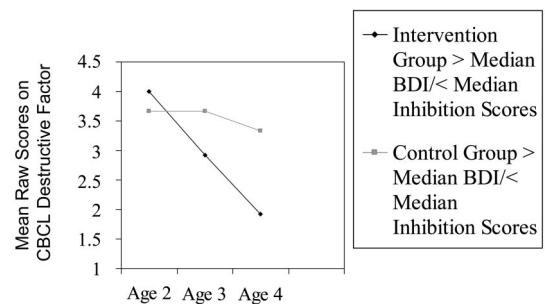


Figure 4. Interaction among child inhibition, maternal depressive symptoms, and intervention group assignment in relation to Child Behavior Checklist (CBCL) Destructive score. BDI = Beck Depression Inventory.

the quality of parent–child relationships. Ideally, we would have anticipated changes in parenting to precede improvements in child behavior, akin to the findings of Forgatch and DeGarmo (1999) in working with divorced families. The chronology of events in the current study suggests that maternal involvement and child behavior both improved between ages 2 and 3 for those in the intervention group and that maternal involvement stabilized between ages 3 and 4, perhaps as a result of improvements in child behavior at age 3. This is in contrast to the deteriorating slope of involvement for mothers in the control group, for whom destructive behavior showed only modest decreases between ages 2 and 3. This result is consistent with a primary goal of the intervention—to sustain parental engagement at age 2 when patterns of family coercion are likely to emerge and lead to more serious CP (Shaw et al., 2003).

Modifying Child Disruptive Behavior

Consistent with the results of other family-centered programs conducted during early childhood (Baydar et al., 2003; Olds, 2002), the FCU was associated with significant reductions in child CP between ages 2 and 4, particularly for children at extreme risk for continued CP. However, there are several issues related to the specificity of the findings that merit discussion.

First, significant reductions in destructive behavior were evident between groups from ages 2 and 3 but were not found at age 4 or for the Aggression Scale at ages 3 or 4, except among families with initially high levels of maternal depressive symptoms and low levels of observed child inhibition at age 2. As the intervention was carried out only at age 2, it was not surprising to find group differences on the Destructive Scale dissipate between ages 3 and 4. Ideally, the FCU is to be carried out at yearly intervals as it was in Dishion and Kavanagh's (2003) successful application with adolescents. Unfortunately, funding issues prohibited follow-up intervention at age 3; however, we look forward to reporting on the effects of follow-up contact that did occur for intervention families after age 4 assessments for which age 5.5 assessments are currently ongoing.

Reaching Low-Income Families With Toddlers

As noted by Spoth et al. (2002), one critical issue in designing preventive interventions is embedding them within existing service entities that have contact with a large percentage of families at high risk for problem behavior trajectories. Finding existing service delivery centers for young low-income children is quite challenging because a large proportion do not have ongoing contact with a primary care physician. Thus, WIC represents a potential target of opportunity for reaching families who would likely not otherwise meet with health professionals in general and mental health professionals in particular (Haines, McMunn, Nazroo, & Kelly, 2002). In fact, the intervention seemed of most benefit to WIC families with boys at greatest risk for continued CP. Those families in the intervention group with maternal depression and low child inhibition showed a decline in CP compared with those in the control group (see Figure 4), the latter of whom displayed only a modest reduction in CP from ages 2 to 4.

Limitations

The study has several methodological limitations that merit consideration. First, although we presented evidence to suggest

that the FCU is associated with improvements in maternal involvement and specific types of child disruptive behavior, positive results were not uniformly evident. Continued follow-up of the present sample will shed light on the endurance of intervention gains seen in the home context and whether such effects are evident at school. As participation in the intervention group might have biased later maternal reports of child behavior, it would have been more optimal to have a second informant of child behavior. Such data should be forthcoming from teachers in the coming year. Our measure of maternal involvement was also limited, consisting of three items from the HOME Inventory. Future studies could easily improve on measurement of this construct. Relatedly, the intervention was designed with the intent of repeated follow-ups, which did not occur because of funding constraints. Thus, treatment effects are likely underrepresented. The sample was also limited to urban, male toddlers from predominantly AA and Caucasian backgrounds, and thus the results may not be generalizable to toddler-age girls and children from other sociocultural contexts. To address these shortcomings, we are currently testing the FCU's efficacy in rural, suburban, and urban locations with a sample ($N = 720$) of boys and girls.

Implications and Future Directions

The current findings provide preliminary evidence that longitudinal changes in parent involvement and child disruptive behavior can be achieved with a brief family-based intervention for toddlers at risk for early starting CP. This was achieved by using an existing, nationally available service delivery setting with low-income children who are at risk for early CP and whose families do not typically use mental health services (Haines et al., 2002). Future follow-up of the present cohort and findings from another larger and more diverse sample should clarify issues regarding the intervention's endurance and generalizability to other populations.

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Received October 15, 2004

Revision received June 3, 2005

Accepted September 21, 2005 ■