

Multi-method Psycho-educational Intervention for Preschool Children with Disruptive Behavior: Preliminary Results at Post-treatment

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Abstract:

Annual screenings of preschool children at kindergarten registration identified 158 children having high levels of aggressive, hyperactive, impulsive, and inattentive behavior. These “disruptive” children were randomly assigned to four treatment conditions lasting the kindergarten school year: no treatment, parent training only, full-day treatment classroom only, and the combination of parent training with the classroom treatment. Results showed that parent training produced no significant treatment effects, probably owing largely to poor attendance. The classroom treatment produced improvement in multiple domains: parent ratings of adaptive behavior, teacher ratings of attention, aggression, self-control, and social skills, as well as direct observations of externalizing behavior in the classroom. Neither treatment improved academic achievement skills or parent ratings of home behavior problems, nor were effects evident on any lab measures of attention, impulse control, or mother–child interactions. It is concluded that when parent training is offered at school registration to parents of disruptive children identified through a brief school registration screening, it may not be a useful approach to treating the home and community behavioral problems of such children. The kindergarten classroom intervention was far more effective in reducing the perceived behavioral problems and impaired social skills of these children. Even so, most treatment effects were specific to the school environment and did not affect achievement skills. These findings must be viewed as tentative until follow-up evaluations can be done to determine the long-term outcomes of these interventions.

Keywords: ADD/ADHD, aggression, classroom behavior therapy, disruptive behavior, parent training, social skills training.

Abbreviations: ADHD: attention deficit hyperactivity disorder; CBCL: Child Behavior Checklist; CPRS: Conners Parent Rating Scale; CPT: Continuous Performance Test; DISC-P: Diagnostic Interview Schedule for Children-Parent; DOF: Direct Observation Form; HSQ: Home Situations Questionnaire; NABC: Normative Adaptive Behavior Checklist; ODD: oppositional defiant disorder; PSI: Parenting Stress Index; PT: parent training; SSQ: School Situations Questionnaire; SSRS: Social Skills Rating Scale; STC: special treatment classroom; TRF: Teacher Report Form; UCI: University of California–Irvine; UMMS: University of Massachusetts Medical School; WPS: Worcester Public Schools.

Article:

Children with early hyperactivity or impulsivity, or those having attention deficit hyperactivity disorder (ADHD), are at a significantly greater risk for numerous psychological and social problems. These include developmental delays in self-regulation and academic achievement, school behavior problems and poor academic performance, poor peer social skills, and increased conflict in parent–child and teacher–child

interactions (Barkley, 1997, 1998; Danforth, Barkley, & Stokes, 1991; Fergusson & Horwood, 1995; Hinshaw, 1992; Mariani & Barkley, 1997; Taylor, Sandberg, Thorley, & Giles, 1991). Such young impulsive children are also at greater risk for antisocial behavior in adolescence (Tremblay, Pihl, Vitaro, & Dobkin, 1994). These children also pose substantially greater stress for their parents, who report feeling less competent in their roles as parents and utilizing less positive approaches to child management in comparison to control groups of children (Anastopoulos, Guevremont, Shelton, & DuPaul, 1992; Fischer, 1990). Most of these risks appear to be increased further by the coexistence of hostile, conduct disordered behavior patterns, or oppositional defiant disorder (ODD), with early-onset hyperactive-impulse behavior (Anastopoulos et al., 1992; Farrington, Loeber, & Van Kammen, 1990; Fergusson & Horwood, 1995; Hinshaw, 1987, 1992; Kingston & Prior, 1995; Soussignan et al., 1992; Stormont-Spurgin & Zentall, 1995). Moreover, children demonstrating this combination of disruptive behaviors are more likely to persist in these behavioral patterns over development than are children who are simply hyperactive or who have ADHD alone (Campbell, 1987; Fergusson & Horwood, 1995; McGee, Partridge, Williams, & Silva, 1991; Soussignan et al., 1992). And such children are more likely to develop conduct disorder, to participate in more delinquent or illegal acts as adolescents, and to engage in greater substance experimentation and eventual dependence and abuse than are purely hyperactive or impulsive children (Barkley, Fischer, Edelbrock, & Smallish, 1990; Biederman et al., 1996; Farrington et al., 1990; Fergusson & Horwood, 1995; Loeber, 1990; Loeber & Hay, 1997).

The substantial risks posed for young children with early hyperactive-impulsive-inattentive behavior when combined with early hostile, defiant behavior clearly justify attempts at early intervention that may decrease or ward off these later developmental risks. Among the most widely employed interventions in clinical practice for children referred for disruptive behavior is parent management training. Such training attempts to promote more positive, prosocial, and compliant behavior in children and more positive, consistent, and predictable child management efforts by parents (Barkley, 1987; Forehand & McMahon, 1981; Patterson, 1982; Patterson, Reid, & Dishion, 1992; Webster-Stratton & Spitzer, 1996). Numerous studies attest to the short-term effectiveness of these programs for clinically referred families (Barkley, 1997; Webster-Stratton & Spitzer, 1996). But their efficacy for community-derived samples, as identified through community or school-based screenings, remains to be reliably established. Compliance by parents in both attending the training meetings and following through on the recommended strategies can be problematic (Cunningham, Bremer, & Boyle, 1995; Kazdin, 1987; Offord & Bennett, 1994). Parental motivation or readiness to change also may be low or at least range widely across families of children identified as high risk via such community screenings (Cunningham, 1997). Social skills training programs are another form of intervention for disruptive children that have received widespread attention. Results of these interventions have been quite mixed, however, and do not provide clear-cut evidence of efficacy (Durlak, 1991; Kazdin, Siegel, & Bass, 1992; Ladd, 1985). A third approach to intervention has involved school-based programs targeting peer relations, classroom conduct, and school achievement (Arnold et al., 1997; Bierman, Miller, & Stabb, 1987; Cunningham & Cunningham, 1998; Pfiffner & Barkley, 1998). These factors are known to contribute to risk for later negative outcomes in addition to those risks associated with parent and family status and functioning (Loeber, 1990). Short-term results of such school-based interventions are promising but evaluations of the longer-term effects of these programs are quite limited at the moment (Coie, Underwood, & Lochman, 1991; Offord & Bennett, 1994). Also, many of the large-scale community-based interventions are only now nearing completion.

Several programs have already attempted to intervene early in the lives of children having “disruptive” behavior patterns or having other factors that place them at risk for developing later antisocial behavior (i.e. low social class). These interventions have typically focused on either parent or classroom interventions or a combination of these programs. Tremblay and colleagues (Tremblay, Pargani-Kurtz, Masse, Vitaro, & Pihl, 1995) conducted a 2-year prevention program for disruptive kindergarten boys from inner-city neighborhoods. The program included a home-based parent-training intervention along with school-based social skills training. The study found that a significantly greater percentage of the treated boys were in age-appropriate class placements by the end of elementary school and reported less delinquent activities across ages 10–15 years than for boys assigned to a control condition. Working with a community-based sample of 1000 first graders, Kellam, Rebok, Iolongo, and Mayer (1994) conducted a 2-year classroom-based prevention program designed to reduce aggressive

behavior through participation in The Good Behavior Game. This game involves a peer and teacher-mediated behavioral intervention program in which children were assigned to teams and rewarded by teachers for maintaining low levels of disruptive and aggressive behavior in themselves and their teammates. Children who were the most aggressive in first grade demonstrated significant improvements in their observable behavior both during first grade and even through middle school. Though not targeted specifically at altering aggressive or disruptive children, the High/Scope Project is another prevention program aimed at preschool age children (3–4-year-old African American children of low-income backgrounds) at risk for retarded intellectual functioning. The project incorporated a preschool classroom intervention program combined with monthly parent group meetings. Follow-up data on the participants through age 19 years indicated multiple positive outcomes for the treated compared to untreated children, including reduced need for special education, reduced school dropout rates, lower levels of antisocial activity and arrest rates, and higher levels of academic achievement and employment. These and other early intervention programs (Johnson, 1988; Lally, Mangione, & Honig, 1988; Webster-Stratton, 1998; Zigler, Taussig, & Black, 1992) aimed at high-risk children from low-income families are encouraging and suggest that some of the later risks associated with low socioeconomic status or early disruptive behavior are malleable. Such behavior can be improved through prevention or early intervention programs that involve parents and/or school classroom settings and so reduce the risk for later conduct problems, antisocial activities, arrest rates, and school underachievement and failure.

With the exception of Tremblay and colleagues, many of these other programs selected preschool or early school-age children for the interventions on the basis of low social class, minority status, single parenthood, or other family risk factors rather than using child behavioral problems as the selection criterion. A concern with such broad spectrum selection criteria is that many of the children so selected do not necessarily demonstrate significant levels of disruptive behavior, nor are they going to proceed to develop the risks that are of concern to the project. Thus intervention resources are not aimed at those children who may have the highest risk of later problems. In contrast, early disruptive behavior in the preschool years has been shown to be reliably associated with later negative academic outcomes and risk for antisocial conduct. Intervention efforts designed to reduce those end-point risks might be more cost-effective if only children demonstrating early disruptive behavior were selected for the intervention as opposed to targeting all children or all children of a given social class or minority group (Boyle & Offord, 1990). This paper describes just such an attempt at an early screening and intervention project targeting high-risk preschool children having high levels of disruptive behavior (defiant, hostile, hyperactive, impulsive, and inattentive) drawn from an urban school district predominated by low-income families.

The project involved a collaborative effort between the University of Massachusetts Medical School (UMMS) and the Worcester Public Schools (WPS). Children were detected through parental ratings as having significantly elevated levels of disruptive behavior at registration for public school kindergarten (ages 4.5–6 years). The children received a relatively thorough psychological and psychiatric evaluation, after which they participated in several different treatment programs involving behavioral, psychosocial, and academic interventions aimed at reducing their risk for negative behavioral, emotional, academic, and social outcomes. The interventions chosen were behavioral parent training and classroom-based behavior modification, social skills training, and enhancement of academic achievement given the promising results of these forms of intervention, as noted above. This paper reports the initial post-treatment results for the 9-month treatment program. The results from the initial pretreatment evaluation comparing all disruptive children with the normal control children in various domains of impairment are reported in a separate paper (Shelton et al., 1998). Later papers will describe the results over a 2-year follow-up as those results become available.

Methods

Subjects

The project took place over a 5-year period (1991-1996). In Spring of 1991 WPS allowed research staff to participate in the annual registration process of all kindergarten-age children entering WPS for the fall kindergarten program for the years 1991-1993. This registration occurs at a central location in Worcester, MA, a city of nearly 170,000 residents having an annual enrollment of approximately 1200 to 1600 preschool children

per year for kindergarten. At this registration, parents were invited to complete a questionnaire about their child's disruptive behavior patterns but were not required to do so to register their children. As a result, some parents declined to complete the scale. Project staff could not track the total number of children registering each year nor the number of parents who opted not to participate in this screening and so the proportion of the latter group to total registrants cannot be estimated. Children who did not speak English or whose parents were not familiar with English sufficient to complete the screening questionnaire were excluded from the project. This had the effect of eliminating non-English speaking Hispanic and Asian families each year from the screening process. In the end, approximately 800 to 1100 children per year participated in the screening for a total of approximately 3100 children across the first 3 years of the project. Of those identified as having high levels of disruptive behavior (see below) and solicited to be in the project, 59 % accepted the invitation, for a total of 170 high-risk children. Subsequently, 12 disruptive children and their parents either withdrew from the project or were deemed ineligible following their comprehensive evaluation, leaving 158 disruptive children as the sample used in this report. None of these children were receiving psychotropic medication at the time of their initial evaluation.

The screening of children for high levels of hyperactive-impulsive behavior and coexisting aggression was permitted by WPS only if it could be done within a brief period (10 minutes) during the already hectic kindergarten registration process. To meet these time constraints, a parent-completed rating scale was constructed for the identification of youngsters having significant elevations in the disruptive behavior pattern according to parental report. The screening scale contained the 14 symptom items for ADHD and 8 symptom items for ODD from the DSM-III-R (American Psychiatric Association, 1987) as well as the non-redundant hyperactive-impulsive factor items and conduct problem factor items from the Conners Parent Rating Scale-Revised (CPRS; Goyette, Conners, & Ulrich, 1978). All items from the scale are listed in Appendix A. There were eight items from the CPRS factors that were viewed as being redundant with those on the DSM symptom lists: Items 16, 19, 20, 27, 30, 33, and 34 (see scale in Barkley, 1987). And so these CPRS items were not used; instead, those eight DSM items redundant with them were substituted for the related CPRS items when scoring the CPRS factors. To be identified as disruptive, parents had to rate their children as placing above the 93rd percentile on the CPRS hyperactive-impulsive items and above the 93rd percentile for the CPRS conduct problem items. Alternatively, children had to have scores exceeding the recommended DSM-III-R clinical diagnostic thresholds for the ADHD and ODD items on the scale (see below).

During the first year of screening, norms published for the CPRS items were employed (Goyette et al., 1978). The cutoff scores for the CPRS factors differed between boys and girls by only 2 points (9 vs. 7) and only by 1 point (13 vs. 12) for the Hyperactive and Conduct Problem factors, respectively. As a result, the project utilized the lower (female) of each of these thresholds to select all children for the project regardless of gender (scores of 7 and 12, respectively). No norms were available in 1991 for the ADHD and ODD items for the DSM-III-R for this young age group. In their absence, thresholds were set at scores of 16 and 10, respectively, based on the first 345 subjects completing the screening form. These cut-scores also agreed with the diagnostic thresholds of 8 and 5 symptoms, respectively, from the DSM using a score of 2 points each that corresponded to the answer "Often" on the scale. During the second and third year of screening, the actual local norms derived from the 1028 children screened in the first year were employed instead for selecting children as high risk. This was done because this first-year sample was far more representative of this local school population, offered a substantially larger sample of this age group than was represented in the CPRS norms ($N = 74$), and provided actual norms for the DSM items employed on the scale. No adjustments needed to be made to the CPRS Hyperactivity Index score or that for the ADHD items from the DSM. For the CPRS Conduct Problems factor, the score was decreased from 12 to 10; for the ODD items, the score decreased from 10 to 9. These thresholds were based on the entire sample of children screened in the first year, collapsed across gender.

The disruptive children whose parents accepted the invitation to be in the project were randomly assigned to participate in one of four treatment groups: (1) no-treatment control ($N = 42$), (2) parent training only (PT, $N = 39$), (3) special treatment classroom only (STC, $N = 37$), and (4) parent training combined with special classroom (combined, $N = 40$). Randomization within gender was done to insure that relatively equal numbers

of each sex were assigned to each treatment group. There were 23 boys and 19 girls in the no-treatment group, 29 boys and 10 girls in the PT group, 27 boys and 10 girls in the STC group, and 26 boys and 14 girls in the combined group. The groups were not significantly different in their gender representation. Randomization had to be violated in eight cases due to several circumstances. In one case, the project had to insure that one set of twins participating in the same cohort be assigned to the same treatment condition given the need for parental participation in the same condition across the twins. In a second case, the same problem arose for one set of siblings in which one sibling and the parent had already participated in an early cohort. And in six cases of children assigned to the STCs, busing could not be provided to children. This was because of their location within the city on unpaved streets where school district busing was not provided to any children residing on these streets. The latter children were assigned to the no-treatment control group if originally placed in the STC group or, if initially offered the combined treatment, they were assigned to the PT group.

Evaluation Procedures

In the summer months of each of the first 3 years, before that cohort of disruptive children started treatment at the beginning of the school year, the disruptive children and their parents participated in a lengthy evaluation. This evaluation was comprised of a battery of structured psychiatric interviews, psychological and academic tests, parent behavior rating scales, and direct behavioral observations of the children in the clinic. These tests and observational procedures were conducted in the same order for all children. In late September, before any treatments were initiated, direct behavioral observations were taken of all children in their kindergarten classrooms and teachers completed behavior rating scales about these children.

The research assistants conducting the clinic evaluations were blind to treatment group membership. However, when conducting the later classroom observations, these assistants could not be prevented from being aware that the children they were observing were in the two special treatment classrooms. They were not told which of those children had parents who were or were not assigned to the additional parent training program. The assistants remained blinded, however, to the treatment group membership of the children they were observing in the regular education kindergarten classes (parent training or no treatment). Likewise, the teachers who completed the teacher ratings on the children in these two special treatment classrooms were obviously aware that the children they were rating were in an experimental treatment classroom. Teachers of the disruptive children who were in regular kindergarten classes, however, were unaware of the treatment group membership of these children.

Treatment Procedures

The parent training program was identical to that published by Barkley (1987) and was offered to parents in a group format over 10 weekly sessions beginning in October of each year. Following these weekly sessions, monthly booster sessions were offered to these parents from January to May of the kindergarten year. All parent training groups were conducted by the same child psychologist who was trained by the first author and who had 5 years experience in this treatment program. The parent training program is comprised of sessions teaching parents: (1) the causes of defiant behavior; (2) positive attending skills and praising; (3) attending to child compliance and improving parental command effectiveness; (4) rewarding children for nondisruptive behavior; (5) setting up a home token system; (6) time out and response cost (fines in token system); (7) managing children in public places with think aloud-think ahead strategies.

The two special treatment classrooms were located in two Worcester Public Schools, one on the east side and the other on the west side of town. Approximately 15 high-risk children were assigned to each of these special kindergarten classes each year and busing was provided to these children to the classrooms by the project. Each classroom was outfitted similarly to a standard kindergarten classroom in WPS. A teacher and teacher aide were hired from an eligible pool of WPS teachers and aides interested in working in these experimental classrooms. The decision to bring all high-risk children together into special classrooms was made on the basis of efficiency and economy of providing the extensive behavioral interventions that would otherwise have been highly impractical to offer to these same children at their numerous neighborhood schools across the entire school district.

The behavioral interventions used in these classrooms were modeled on those in use at the University of California–Irvine (UCI) special school for ADHD children developed by James Swanson, PhD, and colleagues (Linda Pfiffner, PhD, and Keith McBurnett, PhD) (see Pfiffner & Barkley, 1998, for a description). The project also hired a master teacher (CC) from the kindergarten level at this UCI school. This master teacher trained the teachers in the behavioral treatments, and worked a half-day in each of the two experimental classrooms each school day. This was done so as to supervise the teachers, insure consistency in the curriculum and behavioral interventions across the classrooms, individually tutor the children in reading and math skills, and fill in when teachers and aides were absent due to illness. An experienced child psychologist with special expertise in early intervention programs (TLS) also trained the teachers and aides, supervised the classroom intervention program, spot-checked each classroom several times per week for adherence to the program, and met weekly for supervision with the teachers, aides, and master teacher. The teachers and aides hired to be in the project received extensive training from this master teacher and child psychologist in these behavioral methods and the special treatment curriculum during the summer months prior to starting the first cohort's treatment program. They were retrained each summer in the behavioral treatments.

The multiple behavioral interventions used in the project classrooms were: (1) an intensive token system (started in October); (2) response cost, over-correction, and time-out from reinforcement (started in October); (3) group cognitive-behavioral self-control training (started in November); (4) group social skills training, comprised mainly of the Skill Streaming program (McGinnis, Goldstein, Sprafkin, & Gershaw, 1984) and that used in the UCI program (started in November); (5) group anger control training adapted from the program developed by Stephen Hinshaw, PhD, and colleagues at UCLA and UC-Berkeley (started in January); and (6) a daily school report card with home-based reinforcement (started in May of kindergarten; see Barkley, 1990, 1997). Behavior modification programs were also developed by the classroom staff for disruptive behavior during recess or bus-rides, as needed. In addition to this intensive behavioral training program, an accelerated curriculum was designed such that the standard WPS kindergarten curriculum was covered within 3 months, after which greater emphasis was placed on early academic skills, such as reading, spelling, math skills, and handwriting. Children in each class also had access to two personal computers for weekly sessions of skill drills using educational software for math, reading, and logic skills. Use of these personal computers to play videogames also served as a reward in the classroom token systems.

Children who had participated in these special treatment kindergartens were then provided with follow-up consultations to their first grade teachers upon returning to their neighborhood schools for their first grade year. These first grade teachers received consultation from the master teacher and child psychologist during the late summer and early fall. This consultation focused on educating teachers about the behavioral methods used in the kindergarten that might be helpful to extend into first grade. Also discussed were the academic strengths and weaknesses of the student that might require attention from this teacher, and what special educational services the children might be eligible for upon their return to their neighborhood school. Therefore, some effort was provided to program for generalization and maintenance of the special classroom treatment gains into the first grade year. A few first grade teachers each year, however, chose not to receive this consultation. Thereafter, no further interventions from project staff were offered to families.

Dependent Measures

All of the following measures were administered at pre- and post-treatment. Also, seven of the rating scales were also administered in the middle of the treatment year (January). For parents, these scales were the Home Situations Questionnaire, the Parent Practices Scale, the Parenting Stress Scale, and the Parenting Sense of Competence Scale. For teachers, these were the School Situations Questionnaire, the Child Self-Control Rating Scale, and the Social Skills Rating Scale. Results taken at the mid-point of treatment did not differ from the results for these same scales presented below for the post-treatment assessments. So those findings for the mid-point of treatment are not presented here.

Clinical diagnostic interview. The printed version of the Diagnostic Interview Schedule for Children-Parent

(DISC-P) version 2.1 that was constructed and used in the DSM-IV field trials for the Disruptive Behavior Disorders (Lahey et al., 1994) was employed in this study. This particular interview was designed to collect information on both DSM-III-R and DSM-IV symptom lists for 12 childhood disorders. Since the final DSM-IV symptom lists for each disorder are now published, the present project employed those criteria in the scoring of the results of this interview rather than using the older DSM-III-R criteria. The interview also required that both the parent and interviewer provide separate estimates of the child's global assessment of functioning scale using a range of 0 to 100 with lower scores reflecting poorer global functioning.

Mental health history. A printed interview was created to obtain from parents information about the child's interim mental health treatment between the pre- and post-treatment assessments.

Parent ratings of child behavior.

(1) *Child Behavior Checklist* (CBCL; Achenbach & Edelbrock, 1983). This scale provides T-scores for seven different dimensions of child psychopathology and has been used extensively in child mental health research. The revised 1991 scoring system was employed in this study. The Sex Problems, Somatic Complaints, and Thought Problems scales were not used given that these domains of functioning were not a focus of this intervention program and that there is no equivalent Sex Problems scale on the teacher version of the CBCL also used in this project (see below). The scales used were those for Withdrawal, Anxiety/Depression, Social Problems, Attention Problems, Aggression, and Delinquent Behavior.

(2) *Home Situations Questionnaire* (HSQ; Barkley, 1990). This scale assesses the pervasiveness of behavior problems across 16 different home and public settings (Number of Problem Settings) and the severity of these behavior problems (Mean Severity Score) as rated on a Likert scale of 1 to 9. These two raw scores were used in this study.

(3) *Normative Adaptive Behavior Checklist* (Adams, 1984). This 120-item questionnaire surveys parents about a child's adaptive functioning in eight areas of development, including fine motor, gross motor, language, and self-help skills, independence, home responsibilities, etc. The total adaptive behavior score (standard score) was used here.

Parent self-report ratings of psychological adjustment.

(1) *Parenting Stress Index-Short Form* (PSI; Abidin, 1986). This is a shortened version of the original PSI and is completed by parents. It evaluates the degree of perceived stress in the role of being a parent to this particular child. Only the Total Stress raw score was used here.

(2) *Parenting Sense of Competence Scale* (Gibaud-Wallston & Wandersman, 1978; Mash & Johnston, 1983). This self-report scale was employed to evaluate a parent's degree of self-perceived competence or efficacy (nine items) and satisfaction (seven items) in their role as a parent. It produces separate raw scores for each of these two domains.

(3) *Parenting Practices Scale* (Strayhorn & Weidman, 1988). This is a 34-item scale used to assess the extent to which parents use various practices commonly taught in most behavioral parent training programs. A single raw summary score was used here.

Teacher rating scales of child behavior.

(1) *CBCL-Teacher Report Form* (TRF; Achenbach & Edelbrock, 1986): This scale contains 126 items related to children's behavioral and emotional problems. It yields eight T-scores identical to those for the parent version noted above with the exception that no Sex Problems scale is generated. Again, the 1991 scoring system was employed for this study. The scales used were for Withdrawal, Anxiety/Depression, Social Problems, Attention Problems, Aggression, and Delinquent Behavior. The Somatic Complaints and Thought Problems scales were not employed here given that these domains of functioning were not specifically targeted within the intervention programs.

(2) *School Situations Questionnaire* (SSQ; Barkley, 1990). This rating scale provided a measure of the pervasiveness of a child's behavior problems across 12 different school situations (Number of Problems Settings). Each problem setting was rated as to severity using a Likert scale (19) so as to provide a Mean Severity Score across all problem settings. Raw scores were used here.

(3) *Self-Control Rating Scale* (Kendall & Wilcox, 1979). This is a 33-item scale used to assess children's self-control. A single summary raw score was generated for this behavioral dimension.

(4) *Social Skills Rating Scale* (SSRS; Gresham & Elliott, 1990). This standardized and normed teacher-completed scale was used to assess the social skills (30 items), behavioral problems (18 items), and academic competence (9 items) of the children. Three standard scores were obtained from this scale, one for each domain.

Psychological testing.

(1) *Woodcock Johnson Psychoeducational Test Battery* (Woodcock & Johnson, 1984). This lengthy test battery includes a number of tests assessing cognitive abilities (intelligence) as well as a separate battery of tests assessing academic knowledge (science, social studies, humanities) and skills (reading, math, spelling). Standard scores are produced for each subtest. Only the academic knowledge and skills tests were used in assessing treatment effects.

(2) *Continuous Performance Test* (CPT; Gordon, 1983). The preschool version was used here, which provided raw scores for total correct and number of commission errors. The task uses a single digit target ("1") that appears in a random series of digits presented at the rate of one per second on the display screen of a small computerized device. The task lasts 6 minutes. Due to the young age of the subjects and consistent with recommendations of the test developer, the examiner remained in the room during the testing.

Clinic behavioral observations.

(1) *Disruptive behavior during the CPT*. During the child's performance of the CPT, the child's behavior was videotaped from behind a one-way mirror. These videotapes were later coded for four categories of behavior related to ADHD using the Restricted Academic Situations Coding System developed by Barkley (1990). These categories were: off-task, fidgets, vocalizes, and out-of-seat. Definitions of the codes and information on the reliability and validity of the system can be found elsewhere (Barkley, 1990). The examiner records the occurrence of each behavior category within each 15-second interval. The measures derived from this coding system were obtained by calculating the percentage occurrence of each category of behavior relative to its total possible occurrences. A second coder independently recoded 20 % of the videotapes so as to provide an estimate of inter-coder reliability for this measure. Agreement between these two coders for these observations was computed using Pearson product-moment correlations for the scores of percentage occurrence for each behavioral category. The inter-coder agreements across the three cohorts for each category were: off-task = .97, fidgets = .93, vocalizes = .95, and out-of-seat = .97.

(2) *Disruptive behavior during a chip-sort task* (Mariani & Barkley, 1997). This task was designed to be comparable to the Restricted Academic Situations task used with school-age ADHD children (Barkley, 1990). Typically, this procedure involves placing the child in a clinic playroom with adjacent observation room and shared one-way mirror and having the child sit alone and perform math problems. Because of the young age of the subjects used here, this procedure was modified such that the child was required to sort plastic colored chips into containers by their color (red, blue, white) instead of performing math problems. The task lasted 15 minutes. The child was videotaped from behind the one-way mirror during this task. The same four behavior categories used during the CPT were scored for their percentage occurrence in order to measure ADHD symptoms during task performance. Additionally, the number of chips sorted by the child was also scored. A second coder independently recoded 20 % of the videotapes so as to provide an estimate of inter-coder reliability for this measure. Agreement was computed using Pearson product-moment correlations for the percentage occurrence scores for each behavioral category and the results were: off-task = .94, fidgets = .95,

vocalizes = .98, and out-of-seat = .98.

(3) *Mother-child interactions during free play and task periods.* Mothers and children were asked to play with each other using toys in a playroom for a 10-minute period. The mother was then given a list of commands to have her child perform (i.e. pick up toys, dust a table, pick up trash scattered about the floor, pick up clothes scattered about the floor and put them into a box, draw a line together through a maze on an Etch-A-Sketch toy, and have child copy a simple geometric design). During this period a television played a videotape of a popular cartoon show (Scoobie Doo) in the background to serve as a distractor to the child. These free play and task settings were videotaped from behind a one-way mirror. Observers later watched each videotaped session and then rated the mother and child on a rating form of various negative behaviors. Of these items, 14 dealt with maternal behavior (i.e. directive, commanding, punitive behavior, etc.) and 15 with child behavior (i.e. defiance, conflict, negativity, uncooperative, etc.). Each item was rated on a 7-point Likert scale. Separate scores were determined for the children and their mothers for each period (free play, task). A second coder reviewed 20 % of these videotapes and rated the mothers' and children's behavior so as to determine inter-coder reliability. Agreement was computed using Pearson product-moment correlations for the total raw scores calculated separately for the mother's and child's ratings and separately for the free play and task periods. The inter-coder agreements for the free-play setting were: mother's behavior, .59, and child's behavior, .54, suggesting only moderate agreement for this setting. For the task setting, they were: mother's behavior, .67, and child's behavior, .79, which reflect somewhat more acceptable levels of inter-coder agreement. Nevertheless, these moderate levels of reliability suggest some caution in the interpretation of the results of these ratings.

Examiner ratings of subject's behavior throughout testing. A rating scale was created comprising 17 items of various behavioral problems. These included problems in the domains of inattention, hyperactivity, impulsiveness, defiance, anger, aggressiveness, frustration, anxiety, sadness, and withdrawal. Each item was rated on a Likert 7-point scale (1–7) by the Research Technician based upon the subject's behavior throughout the entire testing period. The total raw score served as the measure. Higher total scores reflected more deviant behavior.

Classroom behavioral observations. To record the behavior of children in their classrooms, this study employed the CBCL-Direct Observation Form (DOF; Achenbach, 1986). This coding system is designed to assess the same behavioral items that are found on the parent and teacher versions of the CBCL described earlier. The observer visited the child's classroom and observed the child for 1 hour, after which the rating scale was completed by the observer. The total raw scores for the externalizing and internalizing items were scored separately and reported here. For 20% of the subjects, a second observer accompanied the first to the same classroom and observed the child for the same 1-hour interval, after which they completed this observation form. The two coders in this case sat at different locations in the classroom so as to avoid observing the other's completion of this observation form. Inter-coder reliability was calculated using a Pearson product-moment correlation separately for the externalizing, internalizing, and total raw scores with the following results: internalizing symptoms, .69, externalizing symptoms, .80, and total symptoms, .75.

Results

The four treatment groups of disruptive subjects were statistically compared on a number of initial screening characteristics. These findings are presented in Table 1. The four treatment groups did not differ significantly on any of these screening characteristics. Nor did they differ significantly in their gender representations (see above). The groups also did not differ in the percentage of subjects whose biological parents were married at the time of entry in to the project (no treatment = 62 %; PT only = 65 %; STC only = 64 %; and combined = 51%).

Treatment Effects

The results were analyzed using an intent-to-treat approach in which all subjects returning for the post-treatment evaluation were included in the analyses regardless of the extent to which they or their parents actually participated in the treatment protocol to which they had been randomized. As will be shown later, while all children attended their respective assigned kindergarten classrooms, many parents assigned to the parent

training condition did not attend or attended erratically. There was very little subject attrition by the post-treatment evaluation (none from the control group or parent training only group, three from the classroom only group, and none from the combined treatment group).

The results are discussed separately for each domain of functioning that was assessed in this project. All of the dependent measures were collected at pre-treatment and post-treatment. For most of these measures, the post-treatment scores were analyzed using a 2 (parent-training, no parent training) x 2 (treatment classroom, no treatment classroom) analysis of covariance in which the pre-treatment score for each measure served as the covariate in the analysis of that measure. The level of significance for these analyses was established using a family-wise Bonferroni correction in which a p-value of .05 was divided by the number of measures in that family or group of measures. For other measures of a categorical nature (psychiatric disorders), results at each occasion of assessment were analyzed by chi-square.

Table 1
Demographic Information and Initial Subject Characteristics

Measure	Treatment groups							
	No treatment		PT only		STC only		Combined	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Age (in months)	4.8	0.5	4.8	0.4	4.8	0.5	4.9	0.5
Woodcock Johnson cognitive IQ	98.5	11.6	97.6	15.0	99.1	13.0	95.9	10.4
CBCL								
Attention	58.1	7.8	62.4	8.6	62.7	7.4	65.0	9.7
Aggression	64.1	10.4	69.4	10.1	70.4	11.5	69.0	9.4
Age (yrs)								
Mother	30.3	5.1	30.4	4.7	29.7	5.0	28.2	4.3
Father	33.3	6.0	32.7	5.4	34.7	8.6	31.8	6.0
Education (yrs)								
Mother	12.7	2.4	13.0	2.3	12.3	2.4	13.1	2.0
Father	12.7	2.8	13.2	2.4	13.1	3.1	12.0	1.7
Social Class								
Mother	30.3	24.3	34.5	25.6	35.3	26.5	27.9	19.8
Father	45.9	27.7	42.5	19.8	46.5	22.8	39.0	18.9

Parent reports of psychiatric disorders. Using the DISC-P structured interview, we determined the percentage of subjects in each treatment group who met criteria for the disruptive behavior disorders, the anxiety disorders, and depression/dysthymia at the pre- and post-treatment assessments. These results are shown in Table 2. As this table indicates, the frequency of these diagnoses declined somewhat between pre- and post-treatment in several of the treatment groups. Nevertheless, there were no significant differences among the groups for any of the diagnoses at either the pre- or post-treatment assessment points.

Parent Ratings of Child Behavior and Parenting Competence and Stress

The results for all parent-completed measures are shown in Table 3. Excluding the subscales from the CBCL, there were seven measures analyzed here, and so the p-value for significance was set at .007 (.05/7 = .007). Only the analysis of the Normative Adaptive Behavior Checklist (NABC) reached this level of significance and that was for the main effect for the classroom treatment program. Children receiving the classroom intervention had significantly higher levels of adaptive functioning than those not receiving that treatment. Six of the CBCL scales were analyzed using a p value set at .008 (.05/6 scales = .008). None reached this level of significance for any treatment effects or interactions.

Teacher Ratings and Classroom Observations of Child Behavior

The results for these measures are also displayed in Table 3. Again, excluding the CBCL subscales, there were six teacher rating scales submitted for analysis using a p value of .008 (.05/6 = .008). No significant effects were found for the measures of children's self-control, the number of problematic school settings, or the mean severity of problems across those settings (School Situations Questionnaire; SSQ scores). Two scores from the

Social Skills Rating Scale (SSRS) reached significance at this level for the main effect for the classroom intervention. The children receiving the special classroom intervention had significantly higher levels of social skills and significantly fewer behavioral problems than did those children not receiving this intervention. No significant effects were evident on the Academic Competence subscale of the SSRS, however. There were no significant main effects for the parent training intervention nor for the interaction of parent training with the special classroom program on any of these rating scales.

The six subscales of TRF of the CBCL were also analyzed using a family-wise p value of .008 for significance. Two subscales focusing on attention problems and aggression were statistically significant. These indicated, once again, that children in the classroom intervention had significantly lower scores than those not receiving the classroom intervention. Likewise, the scores for the CBCL DOF were analyzed using a p value of .025 (.05/2 scales). These analyses revealed a significant main effect for the classroom program on the subscale assessing externalizing behavioral problems. Once more, children receiving the classroom intervention were observed to demonstrate significantly fewer externalizing problem behaviors at post-treatment than were those not receiving it. There were no significant main effects for parent training or any significant interaction of parent training with classroom treatment on any of these school measures.

Psychological Tests and Clinic Observations

The results for the measures collected in the clinic laboratory are shown in Table 4. No significant effects were found on any of these measures. More specifically, there were six measures collected during the CPT and so the p value for this family of measures was set at .008. None of the analyses of these measures reached significance for either main effect or the interaction term. Five measures were collected during the chip sorting task and so the p value here was set at .01. No analyses reached this level of significance. Mothers and children were videotaped during a free play and task setting and their behavior rated by observers. The four measures collected from the observations were analyzed using a p value of .013 for significance. No results were significant. The examiner testing each child completed a rating form on the child's behavior across the entire period of psychological testing in the clinic. Analysis of this measure revealed no significant effects using $p < 0.5$. Finally, the eight test scores from the Woodcock Johnson Psycho-educational Test Battery were analyzed using a value for p set at .006 (.05/8 tests). Again, no analyses reached this level of significance.

Treatment Received Outside the Protocol

At the post-treatment evaluation, parents were interviewed about the types of mental health or special educational treatment their children may have received that was not part of the treatment protocol. The percentage of children who had received any such outside services was quite low and the groups did not differ in any area of services (individual therapy, family therapy, special education, or psychiatric medication). By the end of treatment, one (2.5 %) child in the no-treatment group, four (10.8 %) in the PT group, no children in the STC group, and five (12.8 %) in the combined treatment program had been placed on medication. The groups were not significantly different in this respect. Also, it would be difficult to argue that medication played any role in the findings here. All treatment effects that were found were for the classroom intervention and there were equal numbers of children receiving medication in both the group not receiving the classroom intervention and the group that did so (five each).

Analysis of Nonattendees vs. Attendees of Parent Training

Because no treatment effect was evident for the parent training program on any of the dependent measures, the two groups receiving the parent training program (PT only and combined treatment) were examined for the percentage of parents participating in the parent training classes. For the PT only group, 35 % of the subjects had parents who did not attend training, whereas this figure was 31 % for the combined treatment group. The two groups did not differ significantly in the mean number of sessions attended [3.3 sessions for PT only and 4.3 sessions for the combined treatment group; $t(74) = -1.09, p = .28$]. Collapsing across both parent training groups, it was evident that only 25 % of all parents assigned to parent training had attended 1–4 sessions, another 29 % had attended 5–8 sessions, and the remaining 13 % had attended 9–14 sessions.

Table 2
Psychiatric Disorders from the Structured Parental Psychiatric Interview for Each Treatment Group at the Pre- and Post-treatment Evaluations

Disorder	Percentage of treatment groups			
	No treatment	PT only	STC only	Combined
ADHD				
Pre-treatment	55.0	67.6	75.0	66.7
Post-treatment	47.4	52.8	59.4	71.1
ODD				
Pre-treatment	57.1	73.0	64.9	61.5
Post-treatment	43.6	58.3	36.4	61.5
CD				
Pre-treatment	12.2	13.9	29.4	18.4
Post-treatment	12.5	19.4	2.9	15.4
Simple phobia				
Pre-treatment	9.5	16.2	16.2	7.7
Post-treatment	10.0	0.0	0.0	2.6
Social phobia				
Pre-treatment	11.9	2.8	8.3	2.6
Post-treatment	2.5	5.4	0.0	2.6
Separation anxiety				
Pre-treatment	7.1	8.1	10.8	7.7
Post-treatment	2.6	5.4	2.9	5.3
Avoidant disorder				
Pre-treatment	4.9	2.7	5.4	2.6
Post-treatment	2.5	0.0	0.0	2.6
Overanxious disorder				
Pre-treatment	7.1	2.7	8.1	2.6
Post-treatment	10.1	2.7	2.9	2.6
Depression/Dysthymia				
Pre-treatment	9.5	8.3	13.5	2.6
Post-treatment	7.5	2.7	2.9	7.7

A comparison was then made of those parents who did not attend parent training (N = 25) with parents who did attend at least one training session (N = 51) on measures of child and parent characteristics assessed at the initial evaluation of these children. This was done to investigate potential factors that might have been associated with nonattendance. A total of 16 measures were analyzed for such differences using t-tests. Results indicated that the nonattendees did not differ significantly from the attendees in the age of the children (4.7 vs. 4.8 yrs.), the children's IQ (94 vs. 97), the mothers' ages (28 vs. 29 yrs.), the fathers' ages (32 vs. 32 yrs.), or the fathers' social class (43 vs. 40 on Hollingshead). Nor were any differences found on either teacher CBCL ratings of attention problems or aggression, or on measures of parental marital satisfaction, as assessed by the Locke-Wallace Marital Adjustment Test (Locke & Wallace, 1959; see also Barkley, 1981), or parental depression and general parental psychopathology, as assessed by the Symptom Checklist 90 Revised (Derogatis, 1986). The families who failed to attend training had both mothers and fathers who were significantly less educated than those families who did attend training [mothers: 12 vs. 13 yrs., $t(74) = -2.15$, $p = .035$; fathers: 11.5 vs. 12.6 yrs., $t(52) = -2.55$, $p = .014$]. Surprisingly, the children of the nonattendees were rated as being significantly less inattentive and aggressive by their parents on the CBCL than were the children of families who attended training [CBCL Attention T-score: 57.4 vs. 63.8, $t(74) = -3.18$, $p = .002$; CBCL Aggression T-score: 63.9 vs. 69.2, $t(74) = -2.37$, $p = .021$]. All of this suggests that although nonattendees may have been less educated, these parents may also have had less incentive to attend training given that their children were viewed by them as significantly less problematic in their behavior than were the children of families who attended parent training.

Table 3
Post-treatment Adjusted Means and Standard Deviations for the Home and School Measures

Measure	Treatment groups								<i>F</i> ^a	<i>p</i>
	No treatment		PT only		STC only		Combined			
	Mean	<i>SD</i>	Mean	<i>SD</i>	Mean	<i>SD</i>	Mean	<i>SD</i>		
<i>Home measures</i>										
Adaptive behavior ^b	94.3	13.7	92.0	11.1	99.5	13.1	98.2	14.2	10.2 ^c	.002
HSQ										
No. of settings	7.8	3.5	7.6	3.7	7.3	3.2	7.6	3.6	n.s.	—
Mean severity	3.6	1.5	3.4	1.6	3.5	1.6	3.6	1.7	n.s.	—
Parenting										
Practices	138.0	14.0	136.7	12.5	142.0	12.8	140.7	15.0	n.s.	—
Efficacy	29.0	6.1	29.0	3.3	28.7	5.8	30.1	5.9	n.s.	—
Satisfaction	35.4	8.3	36.8	8.2	37.3	7.5	36.6	7.4	n.s.	—
Stress	79.2	26.0	68.0	34.0	73.3	18.1	69.1	24.3	n.s.	—
CBCL										
Withdrawal	54.4	6.7	56.9	12.0	54.0	5.7	53.6	5.7	n.s.	—
Anxiety	55.0	7.4	58.1	12.1	54.7	6.5	55.0	6.6	n.s.	—
Social problems	56.4	6.2	60.7	12.0	56.1	7.9	58.6	8.4	n.s.	—
Attention	58.7	6.9	61.2	1.0	57.1	6.4	59.5	8.5	n.s.	—
Aggression	61.8	8.5	64.9	12.9	59.8	11.1	62.1	10.0	n.s.	—
Delinquent	59.2	8.3	61.6	11.2	58.2	7.4	59.5	9.9	n.s.	—
<i>School measures</i>										
Child self-control	49.7	12.5	46.9	11.8	52.5	13.6	50.6	11.8	n.s.	—
SSQ										
No. of settings	4.2	4.1	4.9	4.1	4.0	4.0	4.2	3.6	n.s.	—
Mean severity	2.2	1.9	2.5	2.2	1.8	1.8	2.0	1.6	n.s.	—
SSRS										
Social skills	99.3	13.1	94.7	13.7	105.5	14.6	103.2	10.1	17.3 ^c	.001
Behavior	104.3	13.9	109.6	15.8	100.5	13.1	101.6	12.1	7.9 ^c	.006
Academic	95.8	13.4	92.7	13.0	94.8	13.7	91.2	11.6	n.s.	—
CBCL-TRF										
Withdrawn	54.6	5.5	56.5	10.3	53.3	4.8	53.7	4.6	n.s.	—
Anxiety	55.3	7.0	55.9	6.4	54.6	6.9	54.0	5.0	n.s.	—
Social problems	55.4	6.0	58.9	8.3	55.0	6.6	55.1	6.3	n.s.	—
Attention	57.1	8.2	58.1	8.5	54.9	6.0	55.2	5.2	7.3 ^c	.008
Aggression	58.3	8.3	60.4	10.8	55.8	5.8	55.7	6.9	9.5 ^c	.002
Delinquent	55.2	6.4	57.3	5.6	53.9	5.3	54.4	6.4	n.s.	—
CBCL-DOF										
Internalizing	10.2	8.1	9.5	6.9	6.7	4.0	9.3	8.5	n.s.	—
Externalizing	10.1	11.7	10.4	9.3	5.6	7.0	7.6	6.3	7.7 ^c	.006

^a *F*-value for ANCOVA if significant.

^b Adaptive behavior from the Normative Adaptive Behavior Checklist.

^c Main effect for classroom treatment groups.

Discussion

The results of the present study are both promising and sobering. They are promising in demonstrating that early school-based intervention with children having significant disruptive behavior problems results in significant improvement in such behavior, in self-control, in social skills, and in home adaptive functioning. To that extent, these results are quite consistent with previous early intervention efforts addressing this population of high-risk children, as discussed earlier. The soberness of these results, however, lies in the finding that a behavioral parent training program offered via the school to families of these high-risk children is ineffective at reaching and assisting these families with the children's behavior problems. This ineffectiveness is due in large part to the failure of many families to attend the training program or, if they did attend, to do so consistently. Less than half of the families offered such training attended at least 50 % or more of the training sessions and nearly a third of these families did not attend any sessions at all. Such a program has no reasonable chance of assisting these families with more effectively managing their children's behavior unless parents cooperate with the training protocol. It is not that this training program is ineffective when parents do attend. This program has been shown in previous studies to produce significant improvements in families who refer their behavior

problem children to clinics (Anastopoulos, Shelton, DuPaul, & Guevremont, 1993; Barkley, 1997; Pisterman et al., 1989). The problem appears to rest in the offering of such a training program to families who have not sought out such services for their children and may not yet be sufficiently ready for change to take advantage of this offering. The positive results of a similar parent training intervention offered by Webster-Stratton (1998) to families of Head Start children might seem to contradict this conclusion. However, those families were not selected because their children had demonstrated significant degrees of disruptive behavior but only on the basis of participation in Head Start. Only 21 % of her intervention group scored approximately + 1.5 SDs above the mean in disruptive behavior whereas all of the children in the present project did so. As noted earlier, children with disruptive behavior are more likely to come from families having greater adversities, poorer parental psychological functioning, and poorer child management skills, making such families less likely to be responsive to training programs than families not having such adversities.

Table 4
Post-treatment Adjusted Means and Standard Deviations for the Lab Measures

Measure	Treatment groups								<i>F</i> ^a	<i>p</i>
	No treatment		PT only		STC only		Combined			
	Mean	<i>SD</i>	Mean	<i>SD</i>	Mean	<i>SD</i>	Mean	<i>SD</i>		
CPT										
Commissions	12.9	15.1	12.8	8.3	11.3	13.2	7.5	7.7	n.s.	—
Total correct	25.2	5.3	24.0	5.2	23.5	5.0	24.2	4.8	n.s.	—
Off-task %	9.0	15.7	9.1	16.9	10.0	17.3	9.8	9.7	n.s.	—
Fidgets %	14.4	14.8	16.3	13.6	13.9	16.1	13.5	12.2	n.s.	—
Vocal %	13.0	18.1	11.1	17.0	16.6	24.6	11.8	17.6	n.s.	—
Out of seat %	11.6	17.8	15.8	25.0	23.4	26.8	16.4	18.5	n.s.	—
Chip sort										
No. sorted	314.7	124.3	285.3	85.2	308.0	140.8	302.5	119.6	n.s.	—
Off-task %	11.9	16.9	11.7	16.0	15.0	21.2	13.0	12.0	n.s.	—
Fidgets %	4.2	6.7	2.7	3.4	3.3	5.7	3.4	7.7	n.s.	—
Vocal %	16.9	20.2	16.2	20.2	19.7	26.4	11.4	17.1	n.s.	—
Out of seat %	33.5	34.0	38.9	33.6	59.1	35.2	39.0	32.9	n.s.	—
Free play										
Child	16.5	2.5	16.9	3.7	16.7	2.2	16.8	2.4	n.s.	—
Mother	18.3	5.7	18.2	2.7	18.4	3.5	18.3	3.1	n.s.	—
Task setting										
Child	21.4	5.7	22.2	7.8	21.7	6.7	21.2	7.3	n.s.	—
Mother	24.1	4.1	24.6	5.6	24.2	4.5	24.5	5.1	n.s.	—
Rating of test behavior	24.5	7.4	27.0	16.5	24.8	6.1	24.7	8.3	n.s.	—
WJ achievement tests^b										
Letter identification	93.8	12.6	97.0	12.1	98.3	12.3	95.6	12.7	n.s.	—
Applied problems	98.2	18.2	99.8	12.4	106.0	16.6	101.0	15.6	n.s.	—
Dictation	97.1	13.8	99.1	10.6	98.6	11.7	96.4	11.8	n.s.	—
Science	109.9	17.4	111.1	19.7	113.9	14.4	106.2	13.0	n.s.	—
Social studies	109.2	17.7	110.6	18.7	110.9	13.2	108.8	14.5	n.s.	—
Humanities	102.9	10.0	102.5	11.4	102.6	9.8	100.9	10.2	n.s.	—
Broad knowledge	106.2	13.5	107.0	13.8	107.7	9.9	104.4	10.0	n.s.	—
Academic skills	95.2	14.3	98.4	11.3	99.7	12.9	96.2	12.8	n.s.	—

^a *F*-value for ANCOVA if significant.

^b Woodcock Johnson Psychoeducational Test Battery.

Parents who did not attend their assigned parent training programs did not differ from other parents in most respects but did appear to be less educated. Their children, however, were rated by the parents as being significantly less inattentive and aggressive than the children of parents who did attend. This might imply that such parents did not have the same need for this training program given that their children were less problematic in their behavioral problems than were the children of those parents who attended at least some training sessions. Such results might suggest that a higher threshold of behavioral deviance should be established for the screening instrument in selecting families to be offered such a parent training program. In any case, the present study constitutes a rather weak test of the efficacy of this parent training program as a treatment for disruptive children. But it does speak to the limited effectiveness (utility) of offering this form of free treatment to parents

of community-derived samples of disruptive children. Such a conclusion is certainly consistent with the report by Cunningham et al. (1995) concerning the limited utility of offering a similar parent training program to behavior problem children in Hamilton, Ontario. Those investigators found that when such a program was taught at a medical center, as was our program, as opposed to at neighborhood schools in the evenings, parental attendance was consistently poorer and fewer minority families participated. Moreover, the results of both studies seem to indicate that parental readiness for change may be an important element in the decision of parents to commit themselves to such a training program even though the children were in need of such a treatment program (Cunningham, 1997).

In contrast, the results suggested that the special classroom intervention program had served its purpose, which was the reduction of hyperactive, impulsive, inattentive, and aggressive behavior as well as the improvement of social skills and self-control in the disruptive children. Reductions in disruptive or externalizing behavior were also documented for children receiving the special classroom treatment through the direct observations taken in school. In this regard, the results are similar to other classroom behavioral programs that have been undertaken with hyperactive, ADHD, or disruptive children (Allyon & Rosenbaum, 1977; Offord & Bennett, 1994; Pelham & Sams, 1992; Pfiffner & Barkley, 1990; Robinson, Newby, & Ganzell, 1981; Tremblay et al., 1995; Zigler et al., 1992). The present study further extends these results to the kindergarten age group studied here. Moreover, the present study suggested that some generalization of the classroom treatment program may have extended to the home setting in view of the significant treatment effects observed on the parents' reports of improved adaptive functioning.

However, the majority of the treatment effects occurred in the school setting and these must be viewed with some caution. The teachers completing the rating scales for the children in the special classrooms were also serving as the treatment staff and may have been biased in their reporting of treatment effects. It is also possible that these teachers were using the other disruptive children in these classes as their comparison standard when completing the ratings while teachers of disruptive children in the regular classes would be using the normal students as the comparison. This difference in comparative standards could have made the teachers rate the disruptive children in the special classes better than might have otherwise been the case if those children had been in normal classes. Weighing against these possible interpretations were the findings from the direct classroom observations which also documented improvements in the behavior of children in these special classes relative to those not receiving such classes. Even so, while efforts were made to keep these research assistants blind to group membership, this blindness could not be maintained for the children receiving the special classes as observers could easily tell which classes were the special treatment programs. This is because the observers had to observe every child in those particular classes while not having to do so for children assigned to their regular neighborhood kindergarten classes. A better test of these treatment effects may need to await the results of the 1- and 2-year post-treatment evaluations planned for these children, at which time teacher ratings will be obtained from teachers who did not serve as trainers of the children in the special classes. The findings of some improvements in parent reports of home adaptive functioning associated with the special classroom treatment program might also suggest that teacher or observer bias cannot solely explain these results. However, the parents of children receiving this treatment were also not blind to their children's participation in a special kindergarten program and may likewise have been biased in their reporting of behavioral improvements.

It appears from these results that neither treatment program resulted in any significant improvements in the objective measures collected in the clinical setting. None of the measures of academic knowledge or skills from the Woodcock Johnson Psychoeducational Test Battery showed any significant improvement as a function of either treatment program, although the majority of them improved significantly over time for all children. Similarly, the measures of sustained attention, impulse control, and hyperactivity taken in the clinic, while also improving as a function of maturation, did not show any differential treatment effects. And there were also no treatment effects evident in either the examiner's ratings of the child's behavior during the evaluation or of observer ratings of parent-child interactions collected during both a free play and task setting. Thus, any treatment effects that were evident in the teacher ratings of behavior and classroom observations did not appear

to generalize to the clinic setting. Nor did they result in significant improvements in children's academic achievement skills, despite the use of a more accelerated classroom curriculum in the special treatment classroom than was used in the regular public school kindergarten.

In conclusion, this rather extensive multi-method behavioral intervention program for high-risk children having aggressive, hyperactive, and impulsive behavior found mixed results. Group parent training in child behavior management offered through a medical center was an ineffective treatment approach for the families of these school-identified children, most likely due to poor parental participation and low readiness for change. An intensive school-year-long behavioral intervention program provided through a specialized kindergarten classroom did result in significant improvements in teacher ratings of disruptive behavior, self-control, and social skills as well as direct observations of child disruptive behavior. However, there was minimal evidence of generalization of these treatment effects outside of the school environment. This treatment also did not appear to produce any significant improvements in the academic achievement skills of the children relative to children attending regular public school kindergarten, despite efforts to target academic achievement through a more accelerated curriculum. It will be important to determine whether those treatment-related improvements in aggression, self-control, and social skills associated with the classroom intervention are able to be maintained at follow-up when these children will have returned to their more typical public school classrooms. There also remains the possibility that over this follow-up period, some additional treatment effects may emerge that were not evident at post-treatment, given that other studies have obtained such " sleeper " effects from their early intervention programs (Tremblay et al., 1995; Zigler et al., 1992). Until then, the results of the present study must be viewed as tentative.

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Appendix A

The items used to construct the screening scale were as follows:

From the DSM-III-R ADHD Symptom List (All 14 Items). (1) Often fidgets with hands or feet or squirms in seat; (2) Has difficulty remaining seated when required to do so; (3) Is easily distracted; (4) Has difficulty taking turns in games or group situations; (5) Often blurts out answers to questions before they have been completed; (6) Has difficulty following through on instructions from others; (7) Has difficulty sustaining attention in tasks or play activities; (8) Often shifts from one uncompleted activity to another; (9) Has difficulty playing quietly; (10) Often talks excessively; (11) Often interrupts or intrudes on others; (12) Often does not seem to listen to what is being said to him or her; (13) Often loses things necessary for tasks or activities at home or at school; (14) Often engages in physically dangerous activities without considering the possible consequences.

From the DSM-III-R ODD Symptom List (All 9 Items). (1) Often loses temper; (2) Often argues with adults; (3) Often actively defies or refuses adult requests or rules; (4) Often deliberately does things that annoy other people; (5) Often blames others for his or her own mistakes; (6) Is often touchy or easily annoyed by others; (7) Is often angry or resentful; (8) Is often spiteful and vindictive; (9) Often swears or uses obscene language.

From the CPRS Hyperactivity Factor (3 of 4 Items Used). (1) Excitable, impulsive; (2) Wants to run things; (3) Restless, always up and on the go. The fourth item not used was “Restless in the ‘squirmy’ sense,” because it was felt to overlap with item (1) from the DSM-III-R ADHD symptom list above.

From the CPRS Conduct Problems Factor (8 of 12 Items Used). (1) Destructive; (2) Pouts and sulks; (3) Steals; (4) Bullies others; (5) Mood changes quickly and drastically; (6) Doesn't like or doesn't follow rules; (7) Basically an unhappy child; and (8) Quarrelsome. The four items that were not used were “Sassy to grownups,” “Carries a chip on his shoulder,” “Denies mistakes or blames others,” and “Disobedient or obeys but resentfully.” These were felt to be redundant with the items from the DSM-III-R list of ODD items shown above.