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Effectiveness of a Self-Administered Training Program for Parents of Children With ADHD

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ABSTRACT: This study examines the effectiveness and integrity of a self-administered version of the Incredible Years: Parents Training program (Webster-Stratton, 2002) as an adjunctive treatment for children diagnosed with attention deficit hyperactivity disorder (ADHD). Using a replicated A-B design across four participants, trendline analysis and examination of mean phase level changes were used to detect parent-perceived improvements in child behavior from baseline to intervention. Preintervention to postintervention changes also were calculated for standardized parent rating scales and parenting practices, and treatment integrity was monitored. Three of four participants evidenced positive changes during the intervention phase. As predicted, changes in core symptoms of ADHD were less consistent than peripheral symptoms. Parents' completion of activities within the self-administered workbooks varied across participants and coincided with child outcomes. Results from this study support future research on this program within the ADHD population. Issues of the transportability of this evidence-based intervention to school-based mental health delivery systems warrant additional consideration.

Determining evidence-based interventions for use in practice can be challenging. Efficacy research, which employs strict standardization of a manual or protocol, randomized control trials, and comparisons to other treatments or placebos, reveals how strongly an intervention creates change or improves functioning. However, one criticism of efficacy research is its inability to predict how or if an intervention will work within real-world, less-controlled settings. Many issues surround effective implementation of evidence-based treatments into practice (Chorpita, 2003). Much of existing intervention research in psychology is limited to Stage I: Treatment Efficacy (Chorpita). This project addresses Stage III: Effectiveness: Dissemination by employing an evidence-to-practice model of research applied to the treatment of attention deficit hyperactivity disorder (ADHD) under highly naturalistic conditions.

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ADHD is characterized by pervasive problems with developmentally inappropriate levels of inattention and/or hyperactivity-impulsivity, which significantly has an impact on functioning (American Psychiatric Association, 2000). In addition to these core symptoms, children with ADHD may suffer from secondary, or peripheral, symptoms often associated with ADHD, such as low tolerance for frustration, oppositional behaviors, peer rejection, or academic delays. Both Barkley (1997) and Rapport, Chung, Shore, and Isaacs (2001) believe neurobiological factors underlie the core symptoms of ADHD, which, in turn, affect the peripheral symptoms. Therefore, if a core symptom is treated (e.g., via medication), then peripheral symptoms should be affected to some degree as well. Likewise, intensive behavioral treatments targeted to specific peripheral symptoms will be helpful, but may not alleviate the underlying core symptoms (Rapport et al.). Based on this model, behavioral treatments utilized simultaneously with medication should best have an impact on the myriad negative outcomes associated with ADHD.

Treatments for ADHD can be targeted toward the child or the parent and can involve medical or behavioral components. The Multimodal Treatment Study Cooperative Group investigated the effects of medical, intensive behavioral, and combined treatments on children with ADHD (MTA Cooperative Group, 1999). Results suggested that, although the medication-only and combined groups did not differ in their improvements on core symptoms of ADHD, peripheral symptoms were more effectively treated in the combined group as compared to the medication-only group (MTA Cooperative Group). Although medication might be an effective option for treating the core symptoms of ADHD, behavior is often not normalized (Pelham, Wheeler, & Chronis, 1998). Intensive behavioral treatments can address additional behaviors within the academic, social, and behavioral realms. There is a need for ADHD interventions, beyond traditional medication treatment, that are effective and convenient. Additionally, interventions should be applicable to both home and school settings.

PARENT-FOCUSED ADHD TREATMENTS

Although environmental causes of ADHD have not been supported by the literature (see Barkley, 2003, for a review), family functioning and parenting factors likely contribute to the severity and maintenance of ADHD symptomology (Johnston & Mash, 2001). The impact of family factors is likely a transactional one, where children's negative behaviors affect parenting behaviors (e.g., increasing parental frustration or stress), which, in turn, may exacerbate children's externalizing problems. Pelham et al. (1998) suggest that parent training is one of two empirically supported treatments for ADHD and that the positive effects of training parents on behavior management techniques are evident up to 4 years posttreatment. Benefits of parent training have been documented through in-home observations, and teacher and parent rating scales, as well as other measures.

EMPIRICAL SUPPORT FOR THE INCREDIBLE YEARS

One program, in particular, has provided much evidence for the effectiveness of parent training in reducing externalizing behavior problems. The Incredible Years: Parents, Teachers, and Children Training Series has well-documented benefits for children with conduct problems (Webster-Stratton & Reid, 2003). This training program employs videotape modeling and suggestions, discussion, and rehearsal to teach parents how to improve their child's behavior. The parent training portion emphasizes positive strategies for behavior management, and its videotape format allows for it to be self-administered within the home setting. Goals for the parent program include increasing positive parenting, decreasing critical or violent parenting, increasing parental problem solving, and increasing home–school collaboration.

Investigations of the effectiveness of this series of training programs have been done primarily with children with conduct disorder and oppositional defiant disorder (e.g., Reid, Webster-Stratton, & Hammond, 2007; Webster-Stratton & Hammond, 1997; Webster-Stratton & Reid, 2003). The parent training programs have been shown to increase positive parenting behaviors and decrease children's oppositional, defiant,

and aggressive behaviors. Studies have also indicated that the benefits of this program have persisted for as long as 3 years (Webster-Stratton & Hammond, 1997; Webster-Stratton, Hollinsworth, & Kolpacoff, 1989). Some support exists for the self-administered version of the Incredible Years: Parents Training program (e.g., Webster-Stratton, Hollinsworth, & Kolpacoff, 1988; Webster-Stratton et al., 1989), which could provide an avenue for cost-effective and convenient implementation. However, few studies have examined the effectiveness of the self-administered delivery method and few have targeted parents of children with ADHD.

Hartman, Stage, and Webster-Stratton (2003) found that children with attention problems, in addition to conduct problems, benefited from a therapist-led version of the Incredible Years. Their study provided evidence that the program is effective with younger children (under 7 years old). A second study by Lees and Ronan (2005) found a therapist-led Incredible Years program was effective for single mothers of children with ADHD (who were also on medication) in improving child behavior reports from parents and teachers, improving family functioning, increasing parental confidence, reducing parental stress and depression, and improving parent–child relationships. The authors concluded that this was an effective and low-cost treatment for single parents of children with ADHD.

This study transfers an evidence-based intervention, the Incredible Years: Parents Training program, to a real-world, uncontrolled physical setting by delivering it within the home via a self-administered format. We measured parent-perceived changes in parenting strategies and child behavior while examining treatment integrity. This study adds to the Incredible Years research base by investigating its effectiveness as a treatment for ADHD. In addition, there is a need for treatment options for ADHD that can supplement medication and that are cost effective, easily accessed, and conveniently implemented. It is important that interventionists consider factors beyond evidence-based effectiveness, such as convenience and likelihood for adherence to the program. Interventions such as this one are particularly relevant to school professionals who seek viable treatment options for families. The following research questions were addressed by this study:

- Is the Incredible Years: Parents Training program, when delivered in a self-administered format, an effective treatment option for ADHD in improving both children's behavior and parenting practices?
- Does level of adherence to the prescribed treatment protocol influence parent-perceived program effectiveness?

We hypothesized that ADHD-related core and peripheral behaviors would decrease in response to the parent training intervention, but that effects would be greater for peripheral behaviors. We also predicted that intervention effects would be greater for parents that followed the training with integrity and reported greater use of the parenting strategies.

METHOD

To recruit participants, fliers offering parent training for parents of children with ADHD were posted in area pediatricians' offices. Interested parents then contacted the primary investigator and a phone interview determined subsequent eligibility. Study inclusion criteria included (a) children had to be between the ages of 7 and 12, diagnosed with ADHD, and on medication for the treatment of ADHD (or about to begin a medication regimen); and (b) families had to expect no major life changes within the next 6 months, allow researchers into their homes every 3 weeks, and speak by phone once a week for a total of 12 weeks. Parents received $100 for their participation.

Participants

Participants were four mother–son dyads. All children were diagnosed by their pediatrician with ADHD Combined Type and were taking medication for the treatment of ADHD. Parent ratings on the baseline measures verified that ADHD symptoms and behavior problems were at least one standard deviation above

the mean for all children (see Table 2). Dyad A, parent and child A, was African American. Child A was 8 years old and taking 10 mg of Focalin® three times per day. Dyad B, parent and child B, was Caucasian. Child B was 10 years old and taking 30 mg of Ritalin-LA® daily. Dyad C, parent and child C, was Caucasian. Child C was 9 years old and taking Focalin XR® daily. Dyad D, parent and child D, was African American. Child D was 10 years old and taking Focalin XR® daily.

Materials

The Incredible Years: Parents Training program was implemented during a 9-week intervention phase. This self-administered parent training program consists of three sets of videos with three corresponding manuals. It was originally designed to be administered within a therapist-led group format. The program provides strategies on how to manage children's behavior. The program is divided into three parts: promoting positive behaviors, reducing inappropriate behaviors, and supporting education.

Intervention

During the first segment, parents learn the importance of promoting positive behavior by using strategies such as paying attention to the child, using effective praise, and providing tangible rewards. The second segment of the program teaches parents to set clear limits, ignore misbehaviors, use time-out procedures, use consequences and start-up commands, and use problem solving with children. Special problems such as lying, hitting, or stealing are also addressed. In the final segment, parents learn ways to promote their child's self-confidence, foster good learning habits, deal with the child's discouragement, participate in their child's homework, and advocate for their child in parent–teacher meetings.

Pre–post measures. We assessed both core and peripheral features of ADHD using the following preintervention and postintervention measures: The LIFT Parenting Practices Interview form (available at www.incredibleyears.com), Behavior Monitor for ADHD Rating Scales—Parent Monitor Ratings (BASC-PMR; Kamphaus & Reynolds, 1998), Eyberg Child Behavior Inventory (ECBI; Eyberg & Pincus, 1999), and the Social Skills Rating System—Parent form (SSRS-P; Gresham & Elliott, 1990).

The LIFT Parenting Practices Interview form measures parents' use of specific discipline techniques. Administered as an interview, the investigator reads a series of questions and marks parent responses. Questions ask parents to rate on a 7-point scale how often (e.g., never, seldom, sometimes, about half the time, often, very often, or always) they utilize specific behaviors (e.g., ignore it, raise your voice, give a spanking, take away a privilege) in response to child misbehavior both in general and in response to specific instances (e.g., If your child hits another child ...). There are also questions asking parents to rate how often they utilize specific behaviors in response to good behaviors (e.g., ignore it, praise or compliment your child, buy something for your child, give an extra privilege), and various questions (rated on 7-point scale from strongly agree to strongly disagree) about parenting behaviors and beliefs (e.g., I have made clear rules or expectations for my child about chores; giving my child lots of free, unsupervised time helps my child learn to be more responsible). Using scoring procedures by Webster-Stratton, Reid, and Hammond (2008), we computed summary scales and examined preintervention to postintervention changes in summary scale scores. Webster-Stratton et al. (2008) initially defined the summary scales theoretically, but then used exploratory factor analysis to examine empirically derived factors. Based on these results, as well as internal consistency analyses, the scales were refined by deleting some items with very low item/total correlations with the scale. Subsequent internal consistency analyses verified that final items correlated significantly with the respective subscale (alphas ranged from .62 to .82). Each summary scale score is the mean of component items on a 7-point scale. The summary scales monitored for this study were Appropriate Discipline (mean of 16 items), Positive Parenting (mean of 15 items), Clear Expectations (mean of 3 items), and Monitoring (mean of 9 items). Higher scores for all scales indicate more positive functioning in that area.

The BASC-PMR is a targeted, norm-referenced measure of ADHD-related behaviors. The 45-item parent report measure results in four scales: Attention Problems, Hyperactivity, Internalizing Problems, and Adaptive Skills. The authors state that the BASC-PMR is designed for repeated data collection to monitor

ratings over time as a measure of treatment effectiveness (Kamphaus & Reynolds, 1998). It has demonstrated adequate internal reliability for males age 8–11 years old (e.g., alphas of .81 for attention problems, .71 for hyperactivity, .74 for internalizing problems, and .79 for adaptive skills). Test–retest coefficients range from .70 to .85. The authors also report evidence of discriminative validity (Kamphaus & Reynolds, 1998).

The ECBI is a 36-item, norm-referenced, parent-report measure of a child's current externalizing behaviors, and its Intensity scale has been found to be sensitive to behavioral changes in response to treatment (Eyberg & Pincus, 1999). The ECBI has an internal reliability coefficient of .95 for the Intensity scale. It is also significantly correlated with the subscales on the Achenbach Child Behavior Checklist with coefficients ranging from .41 to .75.

The SSRS-P is a 55-item, norm-referenced, parent report of a child's social skills and problem behaviors. Social skill items tap cooperation, assertion, responsibility, and self-control. The problems behavior index measures both externalizing and internalizing behaviors. It has adequate internal and test–retest reliability, and has demonstrated predictive validity with the Achenbach Child Behavior Checklist social competence and behavior problems subscales (Gresham & Elliott, 1990).

Progres-monitoring measures. In addition to the standardized measures above, two measures were administered repeatedly over time to track child behavior changes in response to the intervention. A global change form (GCF) was administered weekly, and every third week the BASC-PMR was also administered. The GCF has been used in several evaluation studies for the Incredible Years program. This scale measured perceived change within the past week in the child's hyperactive-impulsive, attention, academic, and social functioning. The GCF uses a 7-point scale with the midpoint indicating "no change" and ratings of 1–3 indicating changes in the positive direction (e.g., these behaviors are *somewhat easier* for the child), ratings of 5–7 indicating changes in the negative direction (e.g., these behaviors are *somewhat more difficult* for the child).

Treatment integrity checklists. Treatment integrity checklists were used to gauge adherence to the program curriculum. These checklists can be obtained by contacting the first author (Christy M. Walcott). Checklists were specific to each of the three topic areas of the program and obtained information regarding (a) how much of the videos the parents watched, (b) how much of the workbooks was completed by the parents, and (c) how many of the target behaviors parents had practiced. Parents self-reported their participation in the above activities during weekly interviews conducted by the investigators either by phone or during home visits. As an additional measure of treatment integrity, the intervention manuals that accompanied the self-administered program were collected at the end of the intervention period. These manuals include several practice exercises or homework assignments for the parent to complete. Then the percentage of total homework or practice activities completed by each parent was calculated.

Procedures and Design

Two trained school psychology graduate students collected all data and implemented the study protocol under the supervision of a certified school psychologist. An outline of the procedural timeline is presented in Table 1. Preintervention baseline data were collected during three weekly home visits. After the 3-week baseline phase, parents were given the first set of videos and workbooks. The parents had 2 weeks to complete the first group of videos and 3 weeks to complete the second and third group of videos. During this intervention phase, weekly measures were administered via phone calls and home visits. Phone calls were made to the families during the weeks when videos were not delivered, and parents orally completed the GCF and treatment integrity checklist. They completed the GCF, treatment integrity checklist, and the BASC-PMR during home visits every third week when new videos were delivered. After the ninth week, a final home visit was made during which parents completed the postintervention measures described above.

Table 1. Procedural Timeline

Baseline 1 (Home visit)
- ☐ Introduce yourself and the study; answer questions and obtain written consent
- ☐ Administer dependent measures:
  - ☐ Parent practices interview, SSRS-P, ECBI, BASC-PMR.
- ☐ Set up next home visit date and time

Baseline 2 (Home visit)
- ☐ Check-in: Questions or concerns?
- ☐ Administer dependent measures:
  - ☐ BASC-PMR, GCF
- ☐ Set up next home visit date and time

Baseline 3 (Home visit)
- ☐ Check-in: Questions or concerns?
- ☐ Administer dependent measures:
  - ☐ BASC-PMR, GCF
- ☐ Give first set of training tapes and manual
- ☐ Set up next phone call time and next home visit date and time

Intervention: Weekly phone call 1
- ☐ Ask about tape/manual completion for the week; any questions or concerns?
- ☐ Administer dependent measure:
  - ☐ Parent video evaluation
  - ☐ GCF
- ☐ Set up next phone call time

Intervention: Weekly phone call 2
- ☐ Ask about tape/manual completion for the week; any questions or concerns?
- ☐ Administer dependent measure:
  - ☐ Parent video evaluation
  - ☐ GCF
- ☐ Confirm home visit date and time

Intervention: Home visit 1
- ☐ Treatment integrity checklist
- ☐ Questions or concerns?
- ☐ Administer dependent measures:
  - ☐ Parent video evaluation
  - ☐ BASC-PMR
  - ☐ GCF
- ☐ Set up next phone call time

Intervention: Weekly phone call 3
- ☐ Ask about tape/manual completion for the week; any questions or concerns?
- ☐ Administer dependent measure:
  - ☐ Parent video evaluation
  - ☐ GCF
- ☐ Set up next phone call time

Intervention: Weekly phone call 4
- ☐ Ask about tape/manual completion for the week; any questions or concerns?
- ☐ Administer dependent measure:
  - ☐ Parent video evaluation
  - ☐ GCF
- ☐ Set up next home visit date and time

Intervention: Home visit 2
- ☐ Treatment integrity checklist
- ☐ Questions or concerns?
- ☐ Administer dependent measures:
  - ☐ Parent video evaluation
  - ☐ BASC-PMR
  - ☐ GCF
- ☐ Set up next phone call time

Intervention: Weekly phone call 5
- ☐ Ask about tape/manual completion for the week; any questions or concerns?
- ☐ Administer dependent measure:
  - ☐ Parent video evaluation
  - ☐ GCF
- ☐ Set up next phone call time

Intervention: Weekly phone call 6
- ☐ Ask about tape/manual completion for the week; any questions or concerns?
- ☐ Administer dependent measure:
  - ☐ Parent video evaluation
  - ☐ GCF
- ☐ Set up next home visit date and time

Intervention: Home visit 3
- ☐ Treatment integrity checklist
- ☐ Questions or concerns?
- ☐ Administer dependent measures:
  - ☐ Parent video evaluation
  - ☐ Treatment integrity checklist
  - ☐ GCF
  - ☐ Parent practices interview, SSRS-P, ECBI, BASC-PMR.
- ☐ Collect videos and manuals
- ☐ Debriefing and payment

This study employed a replicated A-B design across four participants. A multiple baseline design was not employed because baseline data collection began at different points within an eight month period. This was a function of recruitment logistics. Participants were recruited through pediatrician offices, and the parent training program was meant as an adjunct to medication treatment. As such, we had ongoing enrollment in the study as parents expressed interest. Our intent was to transfer an evidence-based intervention to a real-world, less-controlled setting by delivering it within a naturalistic environment. Although an A-B design prevents one from saying with certainty that the intervention (and not some other factor) was responsible for observed changes, documenting preintervention to postintervention improvement is crucial and most applicable to evaluating treatments for individual clients in practice settings.

For the progress-monitoring measures (GFC and BASC-PMR), examination of mean phase level changes, visual analysis of trend/slope changes, and effect sizes measuring magnitude of change were used to detect

Table 2. Preintervention and Postintervention Parent Rating Scale Data for Each Participant With ADHD

	BASC-PMR (mean = 50; SD = 10)							
	Attention		Hyperactivity		Internalizing		Adaptive	
Child	Pre	Post	Pre	Post	Pre	Post	Pre	Post
A	60[a]	62[a]	70[b]	94[b]	64[a]	64[a]	33[a]	33[a]
B	64[a]	61[a]	72[b]	64[a]	72[b]	55	47	56
C	66[a]	54	66[a]	73[b]	92[b]	77[b]	44	50
D	65[a]	65[a]	83[b]	75[b]	73[b]	64[a]	44	52

	SSRS-P subscales (mean = 100; SD = 15)				ECBI (mean = 50; SD = 10)	
	Social skills		Problem behaviors		Intensity of problem behavior	
Child	Pre	Post	Pre	Post	Pre	Post
A	79[a]	70[b]	127[a]	127[a]	69[a]	75[b]
B	81[a]	106	125[a]	100	62[a]	49
C	90	95	122[a]	122[a]	62[a]	65[a]
D	66[b]	100	125[a]	115	67[a]	63[a]

[a]At-risk range. [b]Clinically significant range.

Table 3. Preintervention and Postintervention Data From LIFT Parenting Practices Interview Form

Subscales	Preintervention score[a]	Postintervention score[a]	Change
Use of appropriate discipline (16 items)			
Parent A	6.1	4.8	decrease
Parent B	5.1	5.2	none
Parent C	5.2	5.1	none
Parent D	6.1	5.1	decrease
Use of positive parenting (15 items)			
Parent A	3.8	3.4	none
Parent B	4.9	6.0	increase
Parent C	5.1	5.3	none
Parent D	3.9	4.3	none
Setting clear expectations (3 items)			
Parent A	7.0	7.0	none
Parent B	6.3	6.3	none
Parent C	5.7	5.3	none
Parent D	6.0	6.7	increase
Monitoring your child (9 items)			
Parent A	5.8	6.0	none
Parent B	5.8	6.1	none
Parent C	6.3	6.7	none
Parent D	5.8	5.6	none

[a]Mean rating on a 7-point scale for items within that scale, with higher scores indicating more positive functioning in that area. Increased/decreased = pre–post change of .5 or more (on 7-point scale).

parent-perceived improvements in child behavior in response to the parent training intervention. Preintervention to postintervention changes also were examined for standardized parent rating scales (SSRS-P, BASC-PMR, and ECBI); pre- to post-score changes of one standard deviation or more in the predicted direction were considered significant improvements. Finally, preintervention to postintervention changes in self-reported parenting practices, based on summary scale scores from the LIFT Parenting Practices Interview, were examined.

RESULTS

Treatment effectiveness was examined via changes from baseline to treatment on both peripheral and core symptoms of ADHD. Baseline data indicate that each child participant, despite being medically treated for ADHD, had significant hyperactivity, inattention, and internalizing symptoms prior to the parent training intervention. This is evidenced by scores at least one standard deviation above the mean on the first administration of the BASC-PMR scales. At baseline, participants also had significant social skill deficits and behavior issues as evidenced by scores at least one standard deviation above the mean on the SSRS-P and ECBI scales, with the exception of child C, whose baseline social skills were rated as average compared to

Table 4. Summary of Parent-Reported Treatment Integrity, Parenting Practices, and Child Behavior Changes

	Participant A	Participant B	Participant C	Participant D
Treatment integrity	Skills practiced: 92% Manuals completed: no data	Skills practiced: 79% Manuals completed: 79%	Skills practiced: 90% Manuals completed: 40%	Skills practiced: 96% Manuals completed: 63%
Attention	GCF: improvement BASC-PMR: no improvement	GCF: improvement BASC-PMR: slight improvement	GCF: improvement BASC-PMR: significant improvement	GCF: improvement BASC-PMR: no improvement
Hyperactivity	GCF: improvement BASC-PMR: no improvement	GCF: improvement BASC-PMR: slight improvement	GCF: improvement BASC-PMR: no improvement	GCF: improvement BASC-PMR: slight improvement
Internalizing problems	BASC-PMR: no improvement	BASC-PMR: significant improvement	BASC-PMR: significant improvement	BASC-PMR: significant improvement
Externalizing problems	ECBI: no improvement SSRS-P: no improvement	ECBI: slight improvement SSRS-P: significant improvement	ECBI: no improvement SSRS-P: no improvement	ECBI: slight improvement SSRS-P: slight improvement
Adaptive skills	BASC-PMR: no improvement	BASC-PMR: significant improvement	BASC-PMR: slight improvement	BASC-PMR: slight improvement
Social skills	GCF: no improvement SSRS-P: no improvement	GCF: improvement SSRS-P: significant improvement	GCF: improvement SSRS-P: slight improvement	GCF: improvement SSRS-P: significant improvement
Academic skills	GCF: no improvement	GCF: improvement	GCF: improvement	GCF: improvement

Note. For GCF improvement: positive change in mean ratings across phases; no improvement = negative change in mean ratings across phases. For standardized rating scale measures (BASC-PMR, SSRS-P, and ECBI): significant improvement = pre–post change of one standard deviation or more in predicted direction; slight improvement = less than one standard deviation change in predicted direction.

peers. Only one child (child A) was rated to have significantly below average adaptive skills at baseline. Preintervention and postintervention scores from the BASC-PMR, SSRS-P, and ECBI are presented in Table 2.

In relation to parenting outcomes, preintervention and postintervention scores from the LIFT Parenting Practices Interview form are presented in Table 3. At baseline, on average, parents reported that they often or very often utilized appropriate discipline techniques (e.g., time-out, removing privileges, requiring correction of misbehavior), appropriately monitored their children (e.g., making sure the children are supervised in home and outside), and set clear expectations (e.g., setting clear rules for chores, bedtime). Positive reinforcement techniques (e.g., praise, giving extra privileges, using a reward system) were endorsed less often, with parents, on average, reporting that they used these strategies "about half the time" (mean rating of 4 on a 7-point scale). Postintervention scores on these same summary scales suggested few self-reported changes in parenting practices. Only two of the four parents had increased ratings, and both increased in only one of the four measured parenting practice areas.

A summary of treatment integrity and progress-monitoring results is presented in Table 4 and described below in detail for each dyad. Parent integrity data included how many parent training program videos parents reportedly watched, what behaviors they reportedly practiced, and what percentage of the activities in the manual they completed. Progress-monitoring and postintervention outcomes for individual child participants include global ratings of change over time (GFC) and ratings of specific ADHD-related behaviors over time (BASC-PMR). The progress-monitoring data are graphically depicted in Figures 1–4.

Figure 1. Attention and hyperactivity-impulsivity change ratings via GCF

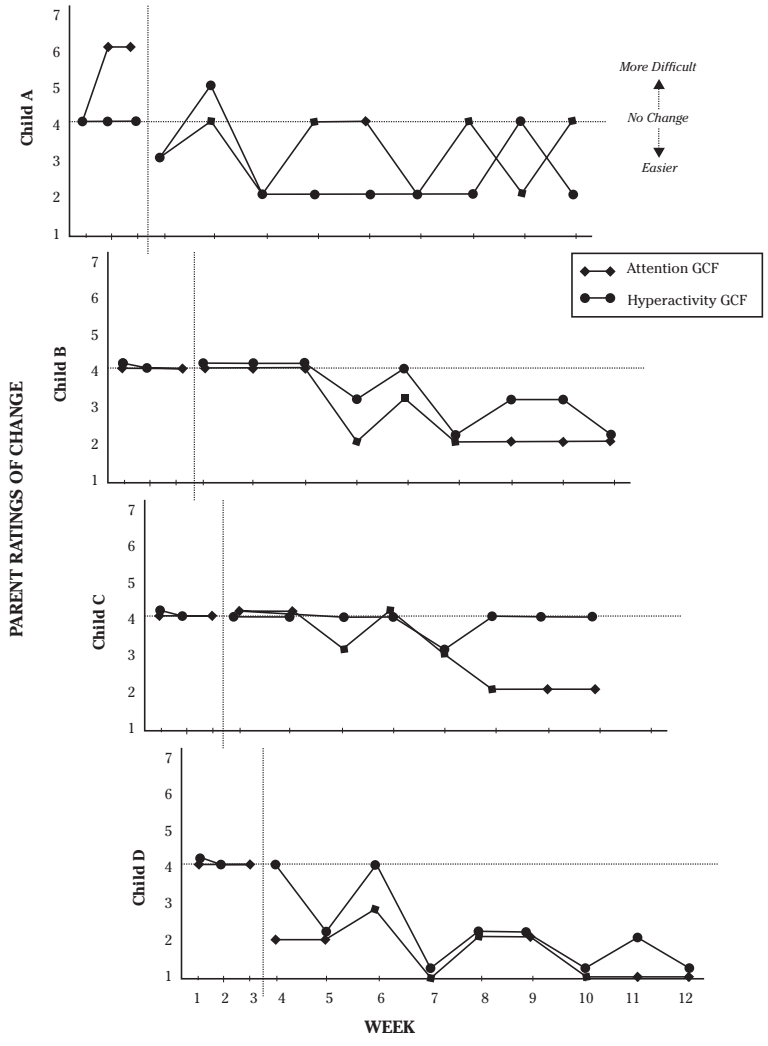
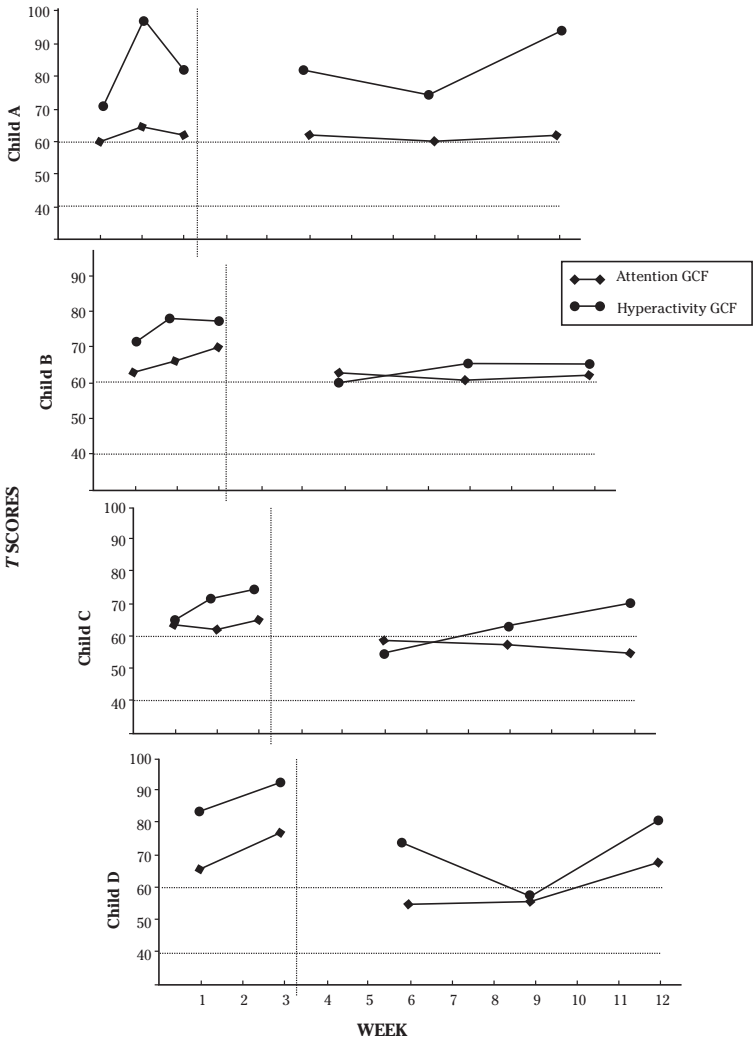


Figure 2. Attention problems and hyperactivity T scores via BASC-PMR

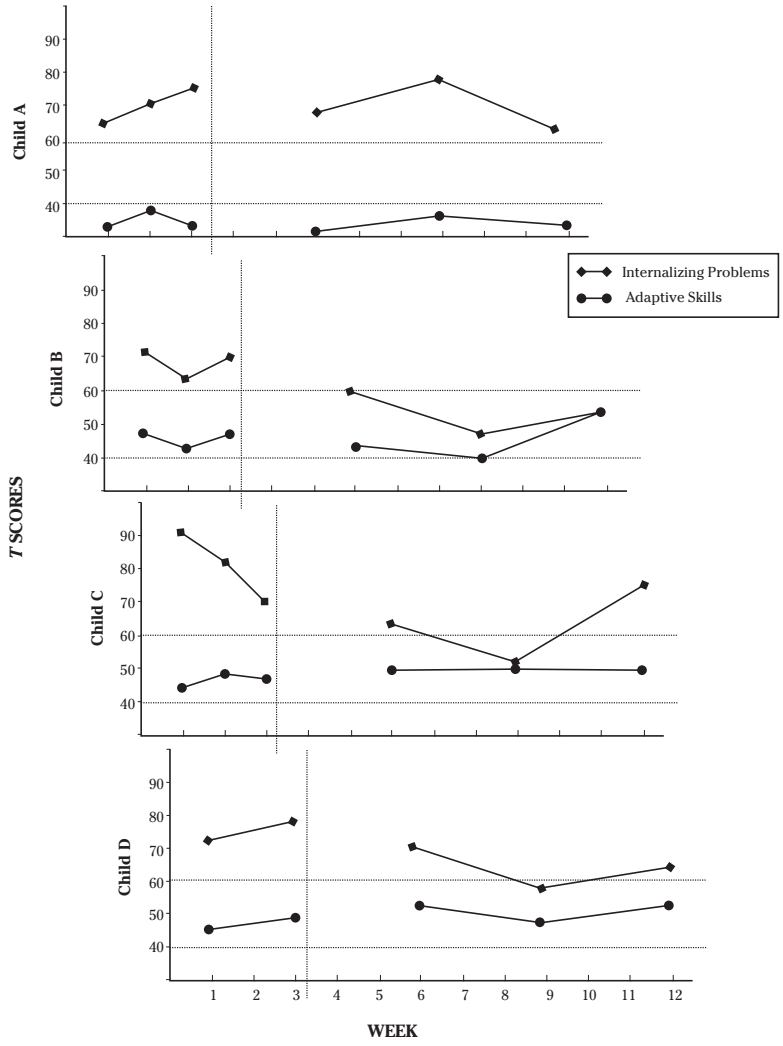


Dyad A

Parent behaviors. The objective measure of treatment integrity was missing for parent A because her family moved out of state after completing the intervention and she did not return the intervention manuals; however, parent A reported watching all of the videos and practicing 92% of the behaviors taught. According to parent responses on the LIFT Parenting Practices Interview form, summary scale scores for Positive Parenting, Clear Expectations, and Monitoring showed little to no change (e.g., < 0.5 change on a 7-point scale). Unfortunately, the score for Appropriate Discipline decreased from preintervention to postintervention. This suggests that parent A's parenting behaviors and strategies did not improve in response to this parent training.

Child behaviors. Child A in Figures 1–4 presents the child's behavior over time based on parent ratings. Because a CGF rating of 4 indicates no change and ratings below 4 indicate that this area was easier for the child in the past week, we hoped to find mean ratings below 4 and a decreasing slope during the intervention phase. Mean-level change across phases suggested positive changes in child A's global hyperactivity-impulsivity and attention according to the parent's report (Figure 1). Improvements in hyperactivity were most notable, with his parent reporting in six out of nine data points that "it has become somewhat easier for [child A] to control his body movements and think before acting." Based on trendline analysis of GCF data, attention ratings did not have a decreasing slope, but hyperactivity ratings did. BASC-

Figure 3. Internalizing problems and adaptive skills T scores via BASC-PMR



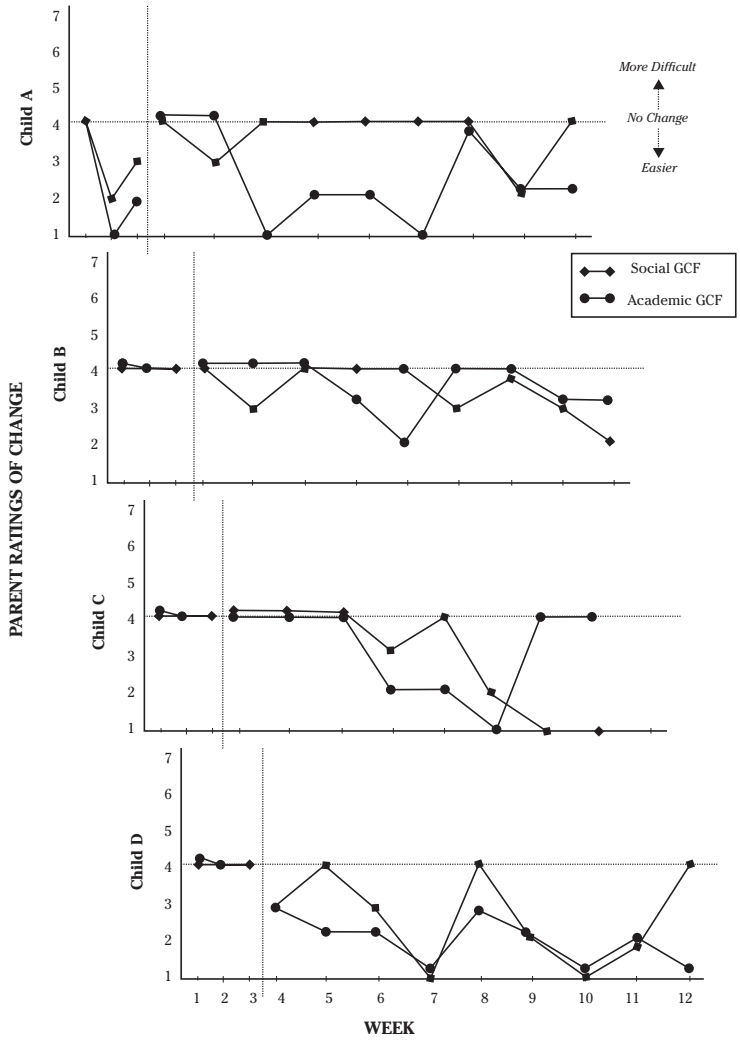
PMR scores, however, did not indicate significant changes in hyperactivity or attention problems from baseline to treatment (Figure 2). BASC-PMR results also did not indicate any change in internalizing or adaptive skills (Figure 3). Social and Academic Skills, as measured by the GCF, suggested no positive changes across phases in response to intervention (Figure 4).

Preintervention to postintervention change on the SSRS-P reflected the same pattern as the GCF (little to no change). Child A's SSRS-P Social Skill score remained significantly below average at postintervention assessment, and the ECBI indicated an increase in the intensity of problem behaviors (Table 2). Overall, for dyad A, there was no evidence across measures that the parent training program was effective in increasing positive parenting practices or reducing ADHD-related problems.

Dyad B

Parent behaviors. Parent B reported that she watched all of the videos and practiced 79% of the behaviors taught. Seventy-nine percent of the activities within the three program manuals were completed. According to the LIFT Parenting Practices Interview form, the summary scale score for Positive Parenting increased more than 1 point on a 7-point scale from preintervention to postintervention. Appropriate Discipline, Clear Expectations, and Monitoring showed little to no change (e.g., < 0.5 change on a 7-point scale). This suggests that parent B utilized more positive parenting strategies following the parent training. Reported

Figure 4. Social and academic change ratings via GCF



strategies included increased use of point charts, praise, and privileges in response to appropriate behaviors.

Child behaviors. Child B in Figures 1–4 presents the child's behavior over time based on parent ratings. Based on both trendline analysis and examination of mean level change across phases, there were decreasing slopes and positive changes in child B's global hyperactivity-impulsivity and attention behaviors after the third week of intervention (Figure 1). BASC-PMR data show similar trends for Attention Problems and Hyperactivity, with *T* scores during the intervention phase approaching the average range and little overlap of data points between phases (Figure 2). Effect sizes, using the standardized difference approach, for Attention Problems (-2.25) and Hyperactivity (-4.62) were large when intervention data were compared to baseline data. Adaptive Skills *T* scores were within the average range throughout the baseline and intervention phases. Internalizing Problems *T* scores decreased to within the average range during intervention (Figure 3), and the effect size was large (-2.91) when compared to baseline data. Social and Academic Skills, as measured by the GCF, also revealed positive changes during intervention as evident by decreasing slopes and lower mean levels during the intervention phase than the baseline phase (Figure 4). However, positive social changes were not apparent until 6 weeks into the intervention. Child B's social–behavioral change was also supported by SSRS-P postintervention data, which indicated child B's social skills increased from below average to average range following intervention (Table 2). Problem behaviors, as measured by the SSRS-P and the ECBI, also decreased from being a significant problem to

falling within the average range. Overall, for dyad B, there was evidence that, following the parent training program, positive parenting practices increased and ADHD-related problems including inattention and hyperactivity-internalizing problems, problems behaviors, social skill, and academic functioning decreased.

Dyad C

Parent behaviors. Parent C reported that she watched all of the videos and practiced 90% of the behaviors taught. However, only 40% of the activities in the training manuals was completed. According to the LIFT Parenting Practices Interview form, all summary scale scores (i.e., Positive Parenting, Appropriate Discipline, Clear Expectations, and Monitoring) showed little to no change (e.g., < 0.5 change on a 7-point scale) from preintervention to postintervention, suggesting that parent C's parenting strategies did not change in response to training.

Child behaviors. Child C in Figures 1–4 presents the child's behavior over time based on parent ratings. Based on trendline analysis of GCF data and examination of mean level changes, there was little to no change in child C's hyperactivity, but small changes in attention after the fourth week of intervention (Figure 1). The GCF attention ratings showed positive mean level change from the baseline to the intervention phase and a decreasing trendline. BASC-PMR data also indicated an improvement in Attention Problems, with *T* scores decreasing from the at-risk range during baseline to the average range during intervention and at postintervention assessment (effect size = -7.51). The BASC-PMR Hyperactivity scores also fell within the average range early in the intervention phase, but then increased steadily to preintervention levels, suggesting no lasting change in response to the intervention (Figure 2). BASC-PMR Internalizing Problems *T* scores improved from baseline to treatment (effect size = -1.35) but showed an increasing trendline during the intervention phase, with a postintervention score returning to the Clinical range (Figure 3). Adaptive Skills *T* scores were within the average range throughout the baseline and intervention phases. GCF data indicated improvements in academic functioning and social skills as evidenced by decreasing slopes and mean level phase changes. Mean levels decreased from 4.0 to 2.9 for social change and from 4.0 to 2.6 for academic change, suggesting that the parent perceived these behaviors to become easier for the child. However, the parent perceived no change in academic functioning in the final weeks of the intervention (Figure 4). According to the SSRS-P, both preintervention and postintervention social skills scores were within the average range compared to peers, suggesting little preintervention concern with social functioning. There were no improvements in child C's significant externalizing problems as evidenced by SSRS-P and ECBI data (Table 2). Parent perceived functioning in this area remained within the at-risk to clinical range compared to peers. Overall, for dyad C, there was low adherence to treatment based on a low manual completion rate and little to no change in parenting behavior from preintervention to postintervention. Child attention showed improvement across time and measures. Parent-perceived internalizing problems significantly decreased from preintervention to postintervention but remained within the clinical range compared to peers.

Dyad D

Parent behaviors. Parent D reported that she watched all of the videos and practiced 96% of the behaviors taught by the Incredible Years. She completed 63% of the activities in the manual. The LIFT Parenting Practices Interview form indicated an increase in setting clear expectations for her child (i.e., Clear Expectations summary scale), but a decrease in her Appropriate Discipline summary scale score. Summary scores for Positive Parenting and Monitoring showed little to no change from preintervention to postintervention (e.g., < 0.5 change on a 7-point scale). This suggests that parent D utilized some positive parenting strategies by setting clearer expectations and rules in response to the parent training.

Child behaviors. Child D in Figures 1–4 present the child's behavior over time based on parent ratings. Based on trendline analysis of GCF data and examination of mean level change across phases there were positive changes in child D's global hyperactivity-impulsivity and attention behaviors soon after the start of the intervention (Figure 1). Mean phase levels decreased from baseline to intervention from 4 to 2.1 for

hyperactivity-impulsivity and from 4 to 1.7 for attention, suggesting that the parent perceived that these behaviors become easier for the child during the intervention phase. Based on BASC-PMR data, *T* scores for Attention Problems and Hyperactivity decreased (effect sizes = -2.33 and -4.32, respectively) and, at some points during intervention, fell within the average range (Figure 2). However, at the end of the intervention phase and at postintervention assessment, both areas were again elevated and within the at-risk to clinical range (Table 2). Adaptive Skills *T* scores were within the average range throughout baseline and intervention. Internalizing Problems *T* scores decreased from the baseline to intervention phase (effect size = -6.98), but remained within the at-risk range at postintervention (Figure 3). According to GCF data, child D showed positive changes from the baseline to intervention phase in both academic and social behaviors as evidenced by decreasing trendlines and mean phase levels (Figure 4). Mean phase levels decreased from 4 to 2.7 for social change and from 4 to 1.9 for academic change. According to SSRS-P data, child D's social skills increased dramatically from the extremely below average range to average range (Table 2). Likewise, on the SSRS-P and ECBI, Problem Behavior scores decreased from preintervention to postintervention but remained in the at-risk range compared to peers. Overall, for dyad D, there was evidence that the parent training program was effective in teaching the parent to set clear expectations and in reducing ADHD-related problems, particularly academic and social functioning.

Experimental Control

This study employed a replicated A-B design across four participants. We hypothesized that ADHD-related core and peripheral behaviors would decrease in response to the parent training intervention, but that effects would be greater for peripheral behaviors. We also predicted that intervention effects would be greater for parents that adhered to the training with greater integrity and reported greater use of the parenting strategies. We found changes in dependent variables that coincided with implementation of the intervention phase for three out of four participants, as evidenced by decreasing trendlines, mean level changes across phases, and at least three positive change effects at three different time points in one or more target behaviors (Horner et al., 2005). Although, an A-B design is inadequate to determine with certainty that the intervention (and not some other factor) was responsible for the observed change, replication of intervention effects across subjects was important to our design. All three positive responders demonstrated change in the following target behaviors: social skills, academic functioning, and internalizing problems. Two of three positive responders also demonstrated improvements in attention, hyperactivity, and/or behavior problems in response to the intervention.

As hypothesized, the dyad with the greatest level of treatment integrity (dyad B) demonstrated the best outcomes across the most target behaviors; the dyad with the next best integrity data (dyad D) demonstrated the next best outcomes; and dyad C, with the lowest treatment integrity of the three positive responders, demonstrated change in the fewest number of target behaviors. For dyad A (the nonresponder), an objective measure of treatment integrity is unknown because the manuals were not available, but low integrity is possible given that the parent reported no positive changes in parenting practices following the intervention and actually decreased her use of appropriate discipline strategies.

DISCUSSION

The purpose of this study was to examine the effectiveness and integrity of an evidence-based parent training program when applied to a real-world, uncontrolled physical setting by delivering it within the home via a self-administered format. This study also investigated the Incredible Years program's effectiveness as a treatment for ADHD, whereas most empirical evidence for the program comes from its application to conduct and oppositional problems. This study more specifically targeted families seeking behavioral treatment in conjunction with standard medication treatment for ADHD. Additionally, past research on the Incredible Years has not focused on the integrity of the self-administered format. This is the first study to examine all three of these areas (i.e., transportability to real-world settings, self-administered format, and treatment for ADHD in conjunction with medication) using the Incredible Years.

Consistent with conceptual models for ADHD that guided this study (Barkley, 1997; Rapport et al., 2001), behavioral targets included peripheral factors associated with ADHD (e.g., internalizing problems, social and academic functioning, and problem behaviors) in addition to core symptoms. We predicted the treatment would have an impact on the specified peripheral features more than the core features because the latter have a greater dependency upon neurobiological substrates. Indeed, the three areas of improvement that were consistent across all three positive responders were the peripheral behaviors of internalizing problems, social skill, and academic functioning. Improvements in core symptoms of ADHD were also apparent, but were less consistent across responders. One parent reported improvements in both hyperactivity-impulsivity and attention problems across multiple measures (i.e., global ratings and an ADHD-specific rating scale). A second parent reported positive changes in attention only, the other in hyperactivity only, when multiple measures were considered.

Using multiple measures of problem behavior, two of the three positive responders showed improvement in response to the intervention, with one child's ratings decreasing to within the average range compared to peers. Although changes were in a positive direction across behaviors and across participants, unfortunately, the majority of children continued to have at-risk or clinically significant levels of hyperactivity, inattention, and behavior problems at the end of this intervention. Although medication targets the core symptoms of inattention and hyperactivity-impulsivity, parent training and other social-behavioral interventions target a variety of secondary symptoms associated with ADHD. This intervention presents a viable addition to, but not a replacement for, standard medication treatment for ADHD. This aligns well with the conceptual models presented earlier, and the data from this study add support for the importance of medication monitoring associated with dosage titration. Specifically, most children in this study remained significantly symptomatic within the core areas of ADHD despite this parent training intervention.

Our prediction that this parent training program would result in positive changes in ADHD-related behaviors hinged upon the idea that the intervention would alter parenting practices in beneficial ways. Our data suggest that parents, based on their self-report, did not substantially change their parenting practices in response to this self-administered intervention. Two of the four parents had no reported increases at all in various positive parenting practices. The other two reported changes in one specific area, that is, setting clear expectations for one parent and increasing use of praise, privileges, and other positive reinforcement techniques for the other. These latter cases replicate findings that the Incredible Years has demonstrated improvements in parent's functioning (Webster-Stratton & Reid, 2003). Interestingly, the two parents who increased their positive parenting strategies were the two with the highest treatment integrity data, and their children showed the greatest improvements. Although the design of our study does not allow us to examine positive parenting changes as a mediator of child outcomes, this would be an important topic for future research. Within our small sample, it does appear that the effectiveness of this intervention depends, at least to some extent, upon adequate treatment integrity and subsequent adoption of the targeted parenting strategies.

It is crucial that effectiveness research examines how well evidence-based interventions transfer into real-world settings, such as the home. Given the self-administered format, it was imperative to determine if this cost-effective and efficient version could be carried out with the same level of integrity as the traditional version, which is delivered within a controlled, therapist-directed setting. Parents reported that they watched the videotapes and engaged in suggested behaviors with relatively high levels of integrity, but our objective assessment of integrity (their completion of activities in the manuals) revealed great variability in adherence to the treatment protocol. Because our findings suggest a link between treatment integrity and positive outcomes, we recommend further study of this relationship. If self-administered formats are to be utilized effectively, researchers and practitioners must determine what components are most appropriate for this type of delivery, identify factors or strategies to improve integrity, and routinely monitor integrity in relation to treatment outcomes.

This study presented some limitations. In terms of experimental design, we did not include a withdrawal (i.e., verification) and replication phase (A-B-A-B design) to ascertain that the training program itself was responsible for the improvements found. Replicated A-B designs across participants were utilized instead. Although this approach is similar to a nonconcurrent multiple baseline design, Christ (2007) argues that a priori specification of multiple baseline durations is a crucial distinction from a series of A-B designs. Unfortunately, although we did specify a priori the baseline duration (2 weeks), we did not vary the length of baseline across participants. This and the fact that our baseline phases were much shorter than our intervention phases make potential confounds and the threat of history more difficult to rule out. Employing a strict, nonconcurrent multiple baseline design with future studies would increase experimental control.

In terms of measurement, the majority of data was based on parent perceptions rather than objective measures of behavior. Parent ratings of their child's behavior may have been skewed positively because the parents wanted the intervention to work or due to a social desirability bias. Further research should include direct observation of the child and parent–child interaction and/or make attempts to blind data collectors to the conditions of the study.

Teachers were contacted for their participation in this study through each child's parent so that contextually relevant measures of academic functioning could be obtained. However, this technique had a low return rate, and we were unable to secure enough teacher data for analysis. If this program were implemented by school psychologists, who have access to the child's teacher, this important layer of ecologically relevant data could be easily examined. Finally, generalizing the results of this study to other parents of children diagnosed with ADHD is limited by the use of reported ADHD diagnoses that were not confirmed by a structured diagnostic process. However, this and the fact that children were not excluded if they had comorbid conditions are consistent with effectiveness research (Chorpita, 2003).

CONCLUSION

In sum, this study demonstrates a potentially useful, cost-effective, convenient training program for parents of children with ADHD. Conceptual models for ADHD (Barkley, 1997; Rapport et al., 2001) and large-scale research findings (MTA Cooperative Group, 1999) support a combined approach to the treatment of ADHD, as do the results of this study. Knowledge of this program is useful to school psychologists and other school-based professionals so that they can provide parents with a potentially useful, cost- and time-efficient intervention to complement medication (or as a viable option for parents who choose not to medicate their child). We found this program to be most influential on the peripheral features of ADHD, particularly internalizing problems, social functioning, and academic functioning, according to parent reports. The intervention was an acceptable and convenient self-administered treatment that parents could utilize within their homes. Although the outcome data for behavioral treatments are often not as strong as the outcome data for psychostimulant treatment, particularly on core symptoms of ADHD, such interventions can be very useful in providing viable alternatives or additive treatment options.
This study represents the kind of work that Chorpita (2003) would label as effectiveness-dissemination research, which examines evidence-based interventions when implemented within highly naturalistic settings. The efficacy of the Incredible Years is well researched, but there is less data on the real-world effectiveness of this treatment, particularly the self-administered program. Treatment integrity appears to be an important factor to consider when using the self-administered version. As such, practitioners should encourage and monitor adherence to the intervention program for positive outcomes to be realized. Future research should continue to examine issues of integrity, acceptability, and feasibility across treatment components.

Given the importance of treatment integrity to the success of this intervention, school-based professionals can play a crucial role in monitoring the effectiveness, integrity, and acceptability of the self-administered version of the Incredible Years: Parents Training program. The Incredible Years website

(www.incredibleyears.com) provides a wealth of information about the programs as well as a variety of assessment tools and forms to assist in progress monitoring and evaluation activities. Segool, Brinkman, and Carlson (2007) present a framework for using single-subject methodologies, such as those used in this study, within the context of behavioral consultation. Imbedding consistent and recurrent evaluation activities within the context of behavior consultation can help support families and schools so they can better address the problem behaviors associated with ADHD.

REFERENCES

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text rev.). Washington, DC: Author.

Barkley, R. A. (1997). Behavioral inhibition, sustained attention, and executive functions: Constructing a unifying theory of ADHD. *Psychological Bulletin, 121,* 65–94.

Barkley, R. A. (2003). Attention deficit hyperactivity disorder. In E. J. Mash & R. A. Barkley (Eds.), *Child psychopathology* (2nd ed., pp. 75–143). New York: Guilford Press.

Chorpita, B. (2003). The frontier of evidence-based practice. In A. E. Kazdin & J. R. Weisz (Eds.), *Evidence-based psychotherapies for children and adolescents* (pp. 42–59). New York: Guilford Press.

Christ, T. J. (2007). Experimental control and threats to internal validity of concurrent and nonconcurrent multiple baseline designs. *Psychology in the Schools, 44,* 451–459.

Eyberg, S., & Pincus, D. (1999). *Eyberg Child Behavior Inventory and Sutter-Eyberg Student Behavior Inventory—Revised.* Odessa, FL: Psychological Assessment Resources.

Gresham, F. M., & Elliott, S. N. (1990). *The Social Skills Rating System.* Bloomington, MN: AGS/Pearson Assessments.

Hartman, R. R., Stage, S. A., & Webster-Stratton, C. (2003). A growth curve analysis of parent training outcomes: Examining the influence of child risk factors (inattention, impulsivity, and hyperactivity problems), parental and family risk factors. *Journal of Child Psychology and Psychiatry, 44,* 388–398.

Horner, R. H., Carr, E. G., Halle, J., McGee, G., Odom, S., & Wolery, M. (2005). The use of single-subject research to identify evidence-based practice in special education. *Exceptional Children, 71,* 165–179.

Johnston, C., & Mash, E. J. (2001). Families of children with attention deficit hyperactivity disorder: Review and recommendations for future research. *Clinical Child and Family Psychology Review, 4,* 183–207.

Kamphaus, R. W., & Reynolds, C. R. (1998). *BASC monitor for ADHD.* Bloomington, MN: AGS/Pearson Assessments.

Lees, D. G., & Ronan, K. R. (2005). *Parent management training for solo mothers of children diagnosed with attention deficit hyperactivity disorder: An effectiveness and multiple baseline evaluation.* Unpublished manuscript, Massey University, Palmerston North, New Zealand. Retrieved May 14, 2008, from http://www.incredibleyears.com/library

MTA Cooperative Group. (1999). A 14-month randomized clinical trial of treatment of attention deficit hyperactivity disorder (ADHD). *Archives of General Psychiatry, 56,* 1073–1086.

Pelham, W. F., Wheeler, T., & Chronis, A. (1998). Empirically supported psychosocial treatments for ADHD. *Journal of Clinical Child Psychology, 27,* 190–205.

Rapport, M. D., Chung, K., Shore, G., & Isaacs, P. (2001). A conceptual model of child psychopathology: Implications for understanding attention deficit hyperactivity disorder and treatment efficacy. *Journal of Clinical Child Psychology, 30,* 48–58.

Reid, M. J., Webster-Stratton, C., & Hammond, M. (2007). Enhancing a classroom social competence and problem-solving curriculum by offering parent training to families of moderate- to high-risk elementary school children. *Journal of Clinical Child and Adolescent Psychology, 36,* 605–620.

Segool, N. K., Brinkman, T. M., & Carlson, J. S. (2007). Enhancing accountability in behavioral consultation through the use of single-case designs. *International Journal of Behavioral Consultation and Therapy, 3*, 310–321.

Webster-Stratton, C. (2002). *The Incredible Years: Parents and Children Series: Self-study video-based learning for parents.* Seattle, WA: Author.

Webster-Stratton, C., & Hammond, M. (1997). Treating children with early-onset conduct problems: A comparison of child and parent training interventions. *Journal of Consulting and Clinical Psychology, 65*, 93–109.

Webster-Stratton, C., Hollinsworth, T., & Kolpacoff, M. (1988). Self-administered videotape therapy for families with conduct problem children: Comparison with two cost-effective treatments and control group. *Journal of Consulting and Clinical Psychology, 56,* 558–566.

Webster-Stratton, C., Hollinsworth, T., & Kolpacoff, M. (1989). The long-term effectiveness and clinical significance of three cost effective training programs for families with conduct-problem children. *Journal of Consulting and Clinical Psychology, 57*, 550–553.

Webster-Stratton, C., & Reid, M. J. (2003). The Incredible Years: Parents, Teachers, and Children Training Series: A multifaceted approach for young children with conduct problems. In A. E. Kazdin & Weisz, J. R. (Eds.), *Evidence-based psychotherapies for children and adolescents* (pp.224–240). New York: Guilford Press.

Webster-Stratton, C., Reid M. J., & Hammond, M. (2008). *LIFT Parenting Practices Interview information*. Unpublished manuscript. Retrieved May 9, 2008, from http://www.incredibleyears.com/Resources/assess_forms.asp.