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GROUP INTENSIVE FAMILY TRAINING (GIFT) FOR PRESCHOOLERS WITH AUTISM SPECTRUM DISORDERS

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Early, intensive behavioral intervention is effective in treating children with autism spectrum disorders (ASDs), but can be cost prohibitive. Expenses may be defrayed if children can benefit from parents acting as therapists. This quantitative case series examines the efficacy of the Group Intensive Family Training (GIFT) program, a 12-week (180 h, delivered 3 h each weekday) parent-training for preschoolers with ASDs. Parents were individually mentored in the hands-on application of behavior analytic techniques, implementing these skills *in vivo* within a group of six parent–child dyads. Seventy-two parents and children (ages 25–68 months) with ASDs participated in this study. Children's cognitive and adaptive functioning was assessed before and after the intervention program. Analyses revealed average gains of eight standard score points on the Mullen Early Learning Composite and five standard score points on the Vineland Adaptive Behavior Composite after 12 weeks of treatment. Additionally, 14% and 11% of the children moved from the 'impaired' to 'non-impaired' range on Mullen and Vineland composite scores, respectively. This preliminary investigation suggests that GIFT's behavioral, group parent-training can lead to significant, yet cost- and time-efficient gains for children with ASDs. Results must be interpreted with caution because of the absence of a control group.

INTRODUCTION

Parents and professionals alike are increasingly concerned with the rising rates of individuals diagnosed with autism spectrum disorders (ASDs), an often disabling continuum of neuro-developmental conditions (Fombonne, 2003). Autism's core symptoms include a reduced capacity for reciprocal social interaction, qualitative impairments in verbal and nonverbal communication, and the presence of restricted or repetitive patterns of behavior (Volkmar & Cohen, 2005). Especially in the absence of effective treatment, young children with autism often develop increasingly

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problematic behavior, including disruptive actions, aggression, and self-injury (Durand, 1990).

Fortunately, more clinicians now routinely screen for ASDs in younger patients, allowing diagnosis in children as young as 18–24 months (Johnson, Myers, & American Academy of Pediatrics, Council on Children with Disabilities, 2007a; Matson, Wilkins, & Gonzalez, 2008). The primary goal of early diagnosis is early intervention, which is particularly important in light of negative correlations between age at onset of intervention and treatment gains (Fenske, Zalinski, Krantz, & McClannahan, 1985). The National Research Council, Committee on Educational Interventions for Children with Autism (2001) reports that children who receive individualized, intensive intervention starting at an early age show the most dramatic treatment response. Their guidelines recommend preschoolers receive a minimum of 25 h of treatment a week, year-round.

Treatment programs applying behavioral principles have received strong empirical support (Cohen, Amerine-Dickens & Smith, 2006; Eikeseth, 2008; Eikeseth, Smith, Jahr, & Eldevik, 2002; Eikeseth, Smith, Jahr, & Eldevik, 2007; Howard, Sparkman, Cohen, Green, & Stanislaw, 2005; Lovaas, 1987; Matson & Smith, 2008; Sallows & Graupner, 2005). Children receiving early, intensive behavioral intervention demonstrate substantial improvement in measures of both cognition and adaptive behavior (Smith, 1999). Behavioral approaches are rooted in learning theory and focus on direct observations and measurement of behavior to identify motivational factors, antecedent stimuli, and various consequences that facilitate skill development and reduce problem behavior. Progress is measured using systematic methods, and the resulting data are used to guide intervention (Cooper, Heron, & Heward, 2007). The overall goal of behavior therapy is to generalize behavior change from the therapeutic setting to the natural environment in order to maximize an individual's ability to function independently (Stokes & Baer, 1977).

To be effective, early behavioral intervention must be sufficiently intensive (Fenske et al., 1985; Lovaas, 1987) and of adequate quality (Eikeseth et al., 2002; Perry, Prichard, & Penn, 2006). Thousands of skills must be systematically taught via hundreds of teaching trials each day, across dozens of hours each week, for several years. Because such treatment is time- and labor-intensive, for many it is prohibitively costly, with estimates ranging upwards of $60 000 per child per year (Butter, Wynne, & Mulick, 2003). Cost-analyses (Chasson, Harris, & Neely, 2007; Jacobson, Mulick, & Green, 1998) demonstrate that 'front-loading' expenses (i.e., providing the highest intensity of intervention during the preschool years) actually saves public dollars in the long-run, but few public agencies allocate such large amounts on preschoolers who have not yet posed serious behavioral problems. Additionally, intensive behavioral intervention is seldom covered by insurance, and most families cannot afford to pay for private treatment.

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One viable option has been for parents to be trained to serve as their child's therapist. A growing body of literature demonstrates the efficacy of teaching parents to implement behavioral intervention techniques (Ingersoll & Gergans, 2007; Sheinkopf & Siegel, 1998; Smith, Buch, & Gamby, 2000). In a study by Koegel, Schreibman, Johnson, O'Neill, and Dunlap (1984), parent training proved to be a more powerful adjunct than lengthening the hours of behavioral treatment in a clinic setting. However, other researchers have found the effectiveness of parent-managed behavioral treatment to be substantially lower than professionally delivered services (Bibby, Eikeseth, Martin, Mudford, & Reeves, 2001), perhaps in part because of difficulty in maintaining the quality of such intervention (Mudford, Martin, Eikeseth, & Bibby, 2001; Symes, Remington, Brown, & Hastings, 2006).

Authors of recently published work in this area (Johnson et al., 2007b; RUPP Autism Network, 2007) urge the development of comprehensive, structured parent-training programs. For such programs to be effective, they must provide intensive, 'hands-on' teaching and include follow-up to maintain the quality of parent-implemented intervention. Finally, Tonge, Brereton, Kiomall, Mackinnon, King, and Rinehart (2006) found parent-training conducted in group settings provides the added advantage of promoting parent mental health and adjustment.

With the above considerations in mind, the Division of Developmental-Behavioral Pediatrics at a large, suburban hospital developed the Hands-On Parent Education (HOPE) Center. Within the HOPE Center, the Group Intensive Family Training (GIFT) program was designed to provide an efficient and effective parent-training model. In this 12-week program, six parent–child dyads attend a preschool-like facility 5 days a week for 3 h a day, for a total of 180 h of training. Enrollment is staggered (i.e., two families exit and two families enter the program every 4 weeks), allowing experienced parents and children to serve as models for incoming families. Parents are taught to function as their child's primary therapist via didactic instruction, modeling, coaching, and constructive feedback provided from videotaped homework. The end objective of the program is to help parents move the intervention from the clinic to their home, with their child's treatment monitored via periodic (and less costly) follow-up consultation from a behavioral psychologist, approximately twice a month.

At the time of this study, the total cost for the 180 h GIFT program was $6500. Follow-up consultation with a behavioral consultant twice monthly at the conclusion of the program averaged $200 per month. Thus, total expense for a full year of services was about $8000, with subsequent years costing only $2400. These costs are substantially lower than the annual cost of $60 000 for professionally implemented intensive behavioral intervention reported in 2003 by Butter et al.

The GIFT program bears similarity to Schreibman and Koegel's (2005) behavioral parent training that targets three 'pivotal' areas shown to affect generalized treatment

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gains in children. As detailed by Schreibman and Koegel, parents first learn to increase children's motivation by giving clear instructions, interspersing maintenance tasks, providing choices, using natural reinforcers when possible, and reinforcing successive approximations to learning targets. Second, to remediate children's stimulus overselectivity, parents learn to teach their children a series of successive conditional discriminations. The third pivotal behavior taught to parents by Schreibman and Koegel is child self-management skills, such as self-monitoring. The GIFT program likewise incorporates these pivotal skills in the teaching curriculum. Differences include a shorter duration of treatment (Schreibman and Koegel report an average of 25 h per family) and the lack of a group-treatment model.

Tonge et al. (2006) describe a behavioral parent-training model that alternates between ten 60-min, individual family sessions and ten 90-min, small group sessions consisting of four to five families. The goals of increasing communication, socialization, and play skills and decreasing behavior problems are consistent with the GIFT program. Unique to the program described by Tonge et al. is a focus on parental stress, grief, and associated mental health problems.

The Research Units on Pediatric Psychopharmacology (RUPP) Autism Network recently developed a 16-week, behavior analytic parent-training model to examine the efficacy of combined pharmacological and behavioral treatment (Johnson et al., 2007b; RUPP Autism Network, 2007). Like the GIFT program, the RUPP protocol focuses on teaching functional communication, reducing problem behaviors, developing new skills, and promoting generalization. Another similarity is the use of videotaping to facilitate parental acquisition of therapeutic techniques. However, the RUPP program provides fewer and shorter parent-training sessions (11–14 sessions lasting 75–90 min versus GIFT's 60, 3 h sessions) and does not utilize a group training format. The RUPP program includes several 'booster' sessions designed to troubleshoot implementation of previously learned strategies, similar to the goal addressed via follow-up behavioral consultation available to families after they complete the GIFT program.

METHOD

As a preliminary examination of the efficacy of this intensive, short-term, multiple-family group treatment model, a quantitative case series was conducted.

Participants

Participants were child-caregiver dyads completing the HOPE Center's GIFT program during the first two years of its operation. Ninety-two families initially

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expressed interest, qualified, and were offered enrollment. Eleven families subsequently declined to participate, primarily due to concerns regarding the financial and time commitment. Of the 81 participants, one parent discontinued treatment prior to the conclusion of the intervention program, citing conflict with her employment. Charts of eight families who completed the program during the time parameters of this study were unavailable to the archivist collecting data. The remaining 72 parent–child dyads served as participants in this study.

All children were diagnosed with an ASD (either Autistic Disorder or Pervasive Developmental Disorder, Not Otherwise Specified) using DSM-IV criteria by experienced physicians and/or clinical psychologists in the community. At the time children began the intervention, their ages ranged from 25 to 68 months, with a mean age of 44 months (SD = 12.6). As expected with ASDs, the majority of children were male (84.7%). To qualify for this intervention, children needed to demonstrate significant impairment(s) relative to their chronological age (i.e., their score on measures of cognitive and/or adaptive functioning fell more than two standard deviations below the mean). Many exhibited co-morbid behavior problems (e.g., noncompliance, aggression, self-injury).

Most caregivers participating in the training program were mothers (96%); others included a father, a grandmother, and an in-home caregiver. For convenience, all will be referred to as 'parents'. Parents' ages ranged from 21 to 46 (excluding the grandmother), with an average age of 35 years (SD = 4.96). Parents had completed an average of 3 years of post-high school education, and most were married (96%).

Setting and Staff

Treatment occurred in the HOPE Center, part of an outpatient developmental-behavioral pediatric setting in a suburban hospital. A Board Certified Behavior Analyst designed each child's individualized behavioral intervention and supervised the treatment program. Four staff members with experience implementing behavior analytic treatment provided hands-on training to each cohort of six families. Each parent–child dyad worked individually with staff members (1:1 ratio) for the first month of treatment; the ratio changed to one staff member for two parent–child dyads (1:2 ratio) thereafter.

Description of Treatment Program

All parents attended a 12 h didactic weekend workshop addressing basic behavioral principles. This provided parents with introductory information about behavior analysis and allowed them to make an informed decision regarding participation in the GIFT program.

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Prior to starting treatment, each child's skill strengths and deficits were evaluated (the criterion-referenced measure used to assist in this process can be found in Partington & Sundberg, 1998a; Partington & Sundberg, 1998b; and the revised version in Partington, 2006a, 2006b). When necessary, the function of any interfering problem behaviors was assessed (Glasberg, 2006). Informal preference assessments were conducted to identify effective reinforcers for each child's acquisition of new skills (Barbera & Rasmussen, 2007). Taken together with any priorities identified by parents, this information was used to design an individualized treatment protocol. Each child's program consisted of hierarchically arranged component skills selected for training, and any problem behaviors targeted for reduction/elimination.

For children with minimal skills, initial goals included pivotal prerequisite behaviors such as attending and cooperating with simple requests. Goals necessary for establishing more complex learning were arranged hierarchically within skill areas such as imitation, matching, receptive and expressive language (Sundberg & Partington, 1998). The design of language goals was guided by Skinner's (1957) functional analysis of verbal behavior (see Carr and Firth's 2005 paper for description of differences between this approach and the structural account of language used by Lovaas in his 1987 study).

Developing spontaneous functional communication skills was an essential treatment goal for all children, as this establishes the basic rules of social interaction, and allows children to initiate social exchanges (Greer & Ross, 2008). Children who were unable to imitate vocal sounds initially learned to use either signs (Carr, 1979) or pictures (Frost & Bondy, 2002) to communicate their requests. The selected mode depended on the relative strength of children's motor imitation versus visual discrimination abilities. Customized play, social, and motor goals were also included as part of each child's curriculum.

In keeping with developmental expectations of preschoolers, children's treatment programs were implemented in the context of short, playful activity sessions. During some sessions, parents learned to teach their children in both adult-directed and child-directed activities. Other sessions paired two children together, teaching parents to use carefully crafted behavioral interventions to teach reciprocal interactive peer play. Still other sessions brought all six children together for small-group activities showing parents how to help their children master targeted prerequisite skills essential for success in a preschool environment (Taubman et al., 2001).

In order to implement their child's individualized therapy, parents were taught numerous intervention procedures. Although a full description is beyond the scope of this paper, techniques included differential reinforcement, response-cost, reinforcement thinning, shaping, chaining, prompting, programmatic generalization, errorless teaching, establishing and transferring stimulus control (Cooper et al., 2007), behavioral momentum (Mace et al., 1988), mand training, and application of

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motivational operations (Michael, 1988; Sweeney-Kerwin, Carbone, O'Brien, Zecchin, & Janecky, 2007). Perhaps most important, parents were taught to incorporate many of these behavioral principles during various day-to-day activities with their children.

Initially, staff modeled the intervention techniques for parents. Subsequently, parents implemented the treatment with staff providing coaching and feedback. Once basic intervention skills were mastered, parents learned data collection techniques essential in determining when their child's mastery (or alternatively, an inadequate acquisition rate) warranted curricular changes.

In the second month, each parent briefly worked with another child in the program. In addition to helping parents think conceptually about behavioral principles, learning from other adults fosters generalization of children's skills. In the third month, parents were encouraged to bring their spouse and/or other adult(s) to the program. With staff assistance, parents taught others how to implement their child's therapy, which further solidified parents' learning and decreased stress by sharing the work of providing therapy (Harris, Peterson, Filliben, Glassberg, & Favell, 1998).

To facilitate the eventual transition of the treatment to the home setting, parents were encouraged to practice their intervention skills with their child at home for approximately 5 h a week. This homework also ensured that children received a high level of treatment intensity. Staff reviewed a weekly videotaped sample of this homework and provided constructive feedback to ensure treatment integrity (Lerman, Swiezy, Perkins-Parks, & Roane, 2000).

Assessment Measures

Children's cognitive and adaptive functioning was assessed using the Mullen Scales of Early Learning (Mullen, 1995) and the Vineland Adaptive Behavior Scales (Sparrow, Balla, & Cicchetti, 1984). Both measures are widely used for this population and provide two independent sources of information about children's functioning. Standard scores for both measures have a mean of 100 and standard deviation of 15 in the normative sample.

The Mullen's Early Learning Composite score estimates young children's global cognitive functioning by averaging four scales measuring subdomains of development: visual reception (includes matching, sorting, and non-verbal problem-solving), fine motor skills, receptive language, and expressive language. The Mullen was standardized on a nationally representative sample of children ranging in age from 2 days to 69 months. This wide range was ideal for participants in this study, as the majority functioned below basal levels on other measures of cognition such as the Wechsler Preschool and Primary Scales of Intelligence. Mullen scores have been found to be sensitive to changes in language and intelligence over

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time (Bradley-Johnson, 1997) and to demonstrate good internal consistency (median reliability of the composite is .91) and inter-rater reliability (ranging from .91 to .99; Mullen, 1995). The Mullen was administered by experienced psychologists using standard procedures. However, these psychologists were not blind to children's intervention status.

Children's adaptive functioning was assessed via parent interview using the Vineland Adaptive Behavior Scales. This measure provides an overall Adaptive Behavior Composite score by averaging four scales assessing separate adaptive domains: communication, socialization, daily living (includes self-help ability), and motor skills. The Vineland is a well-validated tool with strong internal consistency (split-half reliability coefficients range from .91 to .97) and reliability (inter-rater reliability for composite score = .74; Sparrow et al., 1984). It is widely used for individuals with various developmental disabilities, including autism (Sparrow & Cicchetti, 1987).

Children were initially assessed using the Mullen and Vineland at an intake appointment, before families enrolled in the GIFT intervention program. As mentioned previously, to qualify for the program, children needed to demonstrate significant impairment(s) relative to their chronological age (i.e., their score on at least one domain on each measure fell more than two standard deviations below the mean). Intake assessment occurred, on average, 5 weeks prior to the 12-week intervention. Children were evaluated again using the Mullen and Vineland in the final week of the treatment program. Time two assessment was implemented by the psychologist who developed and supervised the individualized intervention, but who had not provided direct treatment (i.e., children were not familiar with the testers).

To address social validity of the GIFT program, a subset of 37 parents (51%) completed a parent satisfaction measure (this measure was not designed until midway through this study). This questionnaire asked parents to rate their level of approval of the program and staff using a 4-point Likert scale (1 = highly satisfied, 2 = satisfied, 3 = mildly satisfied, 4 = dissatisfied).

RESULTS

Preliminary analyses revealed children's standard scores on the Mullen and Vineland did not differ as a function of gender. Due to significant positive skewing of the distribution of Mullen composite and domain scores (this measure does not permit composite standard scores below 49 or domain *T*-scores below 20), nonparametric statistical testing (Wilcoxon signed ranks test) was used.

As shown in Table 1, the mean post-treatment Mullen composite score was significantly higher than at intake and, on average, children performed significantly

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Table 1. Mean cognitive and adaptive standard scores at intake and following intervention

Variable	*Intake Mean (SD)*	*Post-intervention Mean (SD)*	*Significance test*
Mullen composite	51.69 (6.27)	59.65 (16.58)	-5.38^{a**}
Visual reception	60.10 (11.84)	70.99 (23.00)	-4.90^{a**}
Fine motor	57.35 (7.59)	65.29 (18.97)	-4.42^{a**}
Receptive language	56.58 (5.62)	63.94 (20.86)	-3.57^{a**}
Expressive language	56.31 (5.24)	63.81 (19.40)	-4.14^{a**}
Vineland composite	53.11 (7.39)	58.27 (9.59)	6.91^{b**}
Communication	54.61 (8.35)	60.09 (12.19)	6.48^{b**}
Socialization	56.17 (5.29)	61.54 (8.39)	7.84^{b**}
Daily living skills	57.59 (7.96)	59.70 (8.65)	3.18^{b*}
Motor skills	62.74 (13.50)	70.06 (16.20)	5.08^{b**}

SD = Standard deviation.
[a]Wilcoxon signed ranks test (*z*-score).
[b]Paired *t*-test.
$^{*}p < .01$. $^{**}p < .001$.

better after treatment on all Mullen domains (domain scores were converted from *T*-scores to standard scores for ease of comparison). Children made the largest gains in their Mullen visual reception scores, and evidenced similar, more modest improvements in the other domains.

The distribution of Vineland composite and domain scores did not violate assumptions of homogeneity, permitting parametric statistical analysis (paired *t*-tests). Children's mean post-treatment composite and all domain scores on the Vineland were also significantly higher than at intake (Table 1). Vineland motor skills increased most, and daily living skills improved least. Communication and socialization skills fell between these extremes, with relatively similar levels of improvement.

In addition to these tests of statistical significance, clinical significance of the change in Mullen and Vineland composite scores pre- and post-intervention was examined. At intake, the majority of composite scores fell in the impaired range (i.e., standard scores of less than 70) on the Mullen (97%) and the Vineland (96%). This finding was not surprising, given the aforementioned program entry criteria. After the intervention, a total of 10 children's Mullen composite scores (14%) moved from the impaired to the non-impaired range (i.e., score ≥ 70) and eight children's Vineland composite scores (11%) moved from the impaired to the non-impaired range.

Another way to look at the change in children's pre- and post-intervention functioning on the Mullen and Vineland is to examine developmental age-equivalencies (Table 2). Although such scores are less reliable than standard scores, they provide an estimate of the size of children's developmental gains during the course of the treatment program. Because intake assessment often took place several

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Table 2. Mean cognitive and adaptive age-equivalencies at intake and following intervention

	Intake (mean age = 43.3 months) Mean AE (SD)	*Post-intervention (mean age = 47.5 months) Mean AE (SD)*
Mullen composite	16.99 (5.64)	25.20 (7.93)
Visual reception	20.90 (6.52)	29.51 (7.61)
Fine motor	21.44 (5.30)	28.46 (8.81)
Receptive language	13.39 (7.17)	21.85 (10.22)
Expressive language	12.21 (7.12)	21.00 (10.36)
Vineland composite	15.91 (3.60)	21.65 (5.71)
Communication	11.90 (4.71)	17.87 (6.37)
Socialization	10.30 (2.56)	15.75 (4.83)
Daily living skills	17.86 (3.96)	21.68 (5.67)
Motor skills	23.57 (6.20)	30.99 (9.41)

AE = age-equivalency; SD = standard deviation.

weeks before families began the program, the average time interval between pre- and post-intervention assessment was 4.1 months (SD = 1.2), slightly longer than the length of the intervention. During this time period, children made an average of 8.2 and 5.7 months of overall developmental gains on the Mullen and Vineland, respectively. This rate of developmental progress is particularly impressive, as these children had not made month-for-month developmental gains prior to treatment. For the sake of completeness, pre- and post-intervention age-equivalencies on the Mullen and Vineland domains are also provided in Table 2, although domain age-equivalencies are even less reliable than composite age-equivalencies.

Finally, satisfaction with the GIFT program, as rated by the subset of 37 parents completing the parent satisfaction survey, was quite high. The mean overall satisfaction rating was 1.5 (i.e., falling midway between 'satisfied' and 'highly satisfied') indicating that, on average, families were pleased with the program and judged it to be worthwhile.

DISCUSSION

Examination of this quantitative case series provides preliminary evidence that participation in an intensive, but short-term, group parent-training program is associated with statistically and clinically significant improvement in children's short-term cognitive and adaptive functioning. At the intervention's conclusion, mean composite standard scores on the Mullen and Vineland improved by 8.0 and 5.1 points, respectively. Bearing in mind that this intervention was only 12 weeks in length, these findings are generally in keeping with data from Eikeseth and his

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colleagues (2002) who found mean increases in cognitive and adaptive functioning of 17 and 11 standard score points, respectively, following a full year of intensive behavioral treatment from professional therapists. A review by Smith (1999) cites IQ gains ranging from 7 to 28 points, and recent studies by Sallows and Graupner (2005) and by Howard et al. (2005) document IQ gains of 18 and 29 points, respectively, for children receiving intensive behavioral intervention for more than a year.

One could argue that the dramatic Mullen score gains observed at the conclusion of the GIFT program could be due, in part, to the development of pivotal skills such as 'testing compliance'. That is, perhaps some abilities were present at the time of intake testing, but were not demonstrated due to poor instructional control (Matson, 2007). Developing the ability to respond consistently to a typical testing (or learning) environment—sitting at a table, attending to relevant stimuli, engaging with the examiner (or teacher), and following instructions—is a worthwhile goal in and of itself. However, the parallel gains noted on the Vineland argue against the hypothesis that participants' cognitive gains were due solely to their developing pivotal learning skills. Of course, adaptive behavior gains could be due, in part, to parent-expectancy effects. But potential artifacts such as improved compliance and/or parental expectations would not be expected to produce the magnitude of developmental changes observed.

The findings of this quantitative case series have significant limitations. Dependent variables consist solely of clinical data routinely collected as part of families' participation in the GIFT program. Several factors that may influence children's developmental gains, such as the severity of autistic symptoms, were unable to be examined. Although children with interfering behavior received treatment targeting these problems, aberrant behavior could not be quantitatively measured. Systematic assessment of parental treatment fidelity and its relation to children's gains was also beyond the scope of the current study. This limits the ability to definitively determine that parental intervention was responsible for children's gains.

As is often the case in clinical field research, children could not be randomly assigned to alternative modalities of treatment. Many children discontinued other types of therapy during the 12 weeks of this intervention, while others continued to receive a myriad of treatments (e.g., speech therapy, special education services, dietary restrictions, nutritional supplements, etc.). The lack of random subject assignment to treatment and a control group reduces confidence that children's improvements observed in this study are a direct result of the GIFT intervention program and leaves open the possibility that gains may have occurred without this treatment (i.e., could be explained by other factors occurring during this time period).

Another limiting factor is that examiners were not blind to children's pre- or post-intervention status. The psychologists administering assessment measures at the conclusion of treatment did not work directly with the children and thus Mullen

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scores should not have been inflated due to children's familiarity with the examiners. However, these psychologists were involved in developing the children's intervention. As such, they may have been less objective than blind examiners, potentially biased in favor of treatment results.

There are other questions that cannot yet be answered by this preliminary study. Despite the robust effects observed during the 3-month GIFT program, assessment of participants' long-term progress is needed. After completion of parent training, families varied with respect to continued treatment intensity. Although parents learned to effectively implement behavioral intervention, they were not taught to design new treatment programs as their children's skills advanced. For this reason, most utilized a behavioral psychologist an average of twice monthly for follow-up services to oversee in-home intervention. In an effort to maintain at least 20 weekly intervention hours, some parents hired tutors to assist in their child's home treatment. Other parents were unable to maintain this level of intensity, but continued to provide behavioral teaching techniques during day-to-day activities such as dressing, eating, bathing, etc. Long-term follow-up is essential to determine the conditions under which children continue their improvement in cognitive and adaptive functioning after participating in the GIFT program. Finally, because this intervention is not based on a written, standardized manual or protocol, the extent to which it can be replicated is limited.

This treatment model may not be an optimal fit for some families, as it places a significant burden on parents as primary providers of intervention and requires their daily attendance. However, the 3-month training was designed to correspond with the time allotment of the Family Medical Leave Act. Out-of-town families were assisted with local housing and parents from remote areas report that the GIFT program is particularly suited to their needs, citing the lack of service providers near their home as their primary motivation for wanting to learn to serve as their child's therapist. Additionally the program appears to have good social validity based on high parent satisfaction rating.

For many families, the GIFT program shows strong promise as an effective and efficient way for children to obtain early affordable behavioral intervention. This parent-training model is 'hands-on' and builds from a simple to complex level of proficiency. Parents in the GIFT program report a growing sense of empowerment, as a result of observing their efforts produce concrete gains in their children's abilities (Feldman & Werner, 2002). Parents also report receiving social support from one another as they learn together, another benefit of a group intervention model (Hastings & Symes, 2002).

In summary, this study provides preliminary support for the hypothesis that children benefit when their parents receive hands-on training in behavioral interventions during the 3-month, group format described in this study. At the

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conclusion of this parent-training program, children's cognitive and adaptive functioning significantly improved: mean composite standard scores on the Mullen and Vineland increased by 8.0 and 5.1 points, respectively. Additionally, after this relatively short treatment, some children's scores moved out of the impaired range on both cognitive and adaptive measures. On average, children gained 2 months of overall cognitive skills and 1.5 months of overall adaptive skills for each month of intervention.

In conclusion, while factors such as high cost and lack of adequately trained clinicians prevent many children from receiving early, intensive behavioral intervention, this study gives hope that there may be another equally effective way to meet the needs of young children with ASDs. The HOPE Center's GIFT program shows promise in offering a cost- and time-effective behavioral parent-training model in which children can make significant short-term gains. The program merits more rigorous evaluation in controlled studies. Follow-up research should randomly assign participants to wait-list or other control groups, use evaluators blind to intervention status, assess other factors potentially related to treatment response (e.g., treatment adherence), and include longer-term outcome measures.

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