

## Behavioral Family Intervention for Children With Developmental Disabilities and Behavioral Problems

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*The outcomes of a randomized clinical trial of a new behavioral family intervention, Stepping Stones Triple P, for preschoolers with developmental and behavior problems are presented. Forty-eight children with developmental disabilities participated, 27 randomly allocated to an intervention group and 20 to a wait-list control group. Parents completed measures of parenting style and stress, and independent observers assessed parent–child interactions. The intervention was associated with fewer child behavior problems reported by mothers and independent observers, improved maternal and paternal parenting style, and decreased maternal stress. All effects were maintained at 6-month follow-up.*

Behavior problems are common in young children with developmental disabilities (Emerson, 2003). Quine (1986) found that 64% of preschoolers with severe intellectual disability displayed challenging behavior, such as self-injury, aggression, and ritualistic behaviors. Einfeld and Tonge (1996b) found 41% of children with intellectual disabilities had severe behavioral or emotional problems. Behavior problems create a significant burden, interfering with a child's social and educational skills, leading to exclusion from community settings, and even threatening physical health (Roberts, Mazzucchelli, Taylor, & Reid, 2003; Tonge, 1999). Families experience substantial stress, often requiring more respite services to cope, and use of more intense and costly interventions (Hudson, Jauernig, Wilken, & Radler, 1995; Roberts et al., 2003). Also, many challenging behaviors in individuals with intellectual disabilities are extremely persistent over time (Green, O'Reilly, Itchon, & Sigafos, 2005).

Parent management training and behavioral family interventions (BFI) that train parents to respond contingently to child behavior and to plan activities to minimize opportunities for disruptive behavior have been used extensively and effectively with typically developing children to improve child behavior and adjustment (Kazdin, 2005). Reviews and randomized control trials with preschool children have reported reductions in child behavior problems, critical parenting, and parental stress, plus more positive parenting (Bryant, Vizzard, Willoughby, & Kupersmidt, 1999; Feinfeld & Baker, 2004; Reid, Webster-Stratton, & Baydar, 2004; Webster-Stratton, Reid, & Hammond, 2004).

Recent reviews of such interventions for children with disabilities indicate similar positive results (Gavidia-Payne & Hudson, 2002; Roberts et al., 2003). Hudson et al. (2003) reported that a BFI called Signposts implemented via group, telephone, or self-directed modes was equally effective in decreasing child behavior problems, enhancing parental efficacy, and reducing parental stress in families of children 4 to 19 years with disabilities and challenging behaviors. Sanders and Plant (1989) successfully implemented BFI strategies with five families of preschoolers with developmental disabilities and observed decreases in deviant child behavior across multiple settings. After parent management training Lowry and Whitman (1989) found positive changes in child behavior and more responsive and contingent interaction styles between mothers and their infants with developmental delay. Similarly, Harrold, Lutzker, Campbell, and

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Touchette (1992) observed more on-task behavior and less crying and aggressive behavior in young children with intellectual disabilities in four mother-child dyads following a BFI program. Using planned activity training alone, Huynen, Lutzker, Bigelow, Touchette, and Campbell (1996) observed that mothers gave clearer instructions and their young children with intellectual disabilities demonstrated more compliance and on-task behaviors, which generalized to new settings.

These results are promising and support the need for early intervention. However, Roberts et al. (2003) found that many studies with preschool children with developmental disabilities and behavior problems had methodological limitations; sample sizes were small, few studies used randomized control designs, and follow-up assessments were rare. There is a clear need for more randomized controlled trials of early intervention for young children with developmental and behavior problems, with adequate follow-up assessments.

Stepping Stones Triple P (SSTP; Sanders, Mazzuchelli, & Studman, 2003a) is an adaptation of the Triple P Positive Parenting Program (Sanders, 1999) for families of children with developmental disabilities. Triple P incorporates the principles of BFI and parent management training and has proven effective in reducing behavior problems in many randomized control trials with a variety of populations, such as children in families with marital problems, children of depressed parents, children in socially disadvantaged families, children in stepfamilies, children with attention deficit hyperactivity disorder, and children at risk for child abuse (Sanders, 1999; Sanders, Turner, & Markie-Dadds, 2002). SSTP adaptations include making the content and materials more sensitive to families of children with disabilities and coverage of additional issues relevant to such parents (e.g., adjustment to having a child with a disability, increased care giving, inclusion and community living, and family supports). Additional causal factors for behavior problems are considered (e.g., communication difficulties, lack of stimulation, automatic reinforcement, and stopping a disliked activity). Behavior change protocols for common problems associated with disability (e.g., self-injurious behavior, pica, and repetitive behaviors), and strategies such as blocking, physical guidance, and functional communication training are also included (Sanders, Mazzuchelli, & Studman, 2004).

This study reports on the first randomized control trial of SSTP with preschool children with disabilities. Child behavior problems and family outcomes for mothers and fathers such as parenting style, parental stress, and treatment satisfaction were evaluated. Families were followed up at 6 months to assess maintenance of effects. We predicted that SSTP would be associated with reductions in child behavior problems and more positive parenting styles at postintervention, compared to a wait-list control group. Changes in in-

tervention group child and parental behavior were predicted to occur in both target and generalization settings. We expected that SSTP would be associated with reduced parental stress at postintervention compared to the control group and that maintenance of all effects at a 6-month follow-up would occur.

## Method

### Participants

Forty-seven families and 51 children were recruited through the Western Australian Disability Services Commission's (DSC), with 24 families (27 children) randomly allocated to an intervention group and 23 families (23 children) to a wait-list control group. Forty-eight children with behavior problems (10 girls) ages 2 to 7 years from 44 families were assessed for eligibility, after 3 control-group families declined to participate. All children were registered with DSC because of developmental disability and had levels of intellectual or adaptive functioning that were more than two standard deviations below their age norms. Table 1 indicates that the sample displayed primarily mild developmental delays. Half of the children had known causes of disability: Down's syndrome ( $n = 8$ ), other genetic syndromes ( $n = 8$ ), cerebral palsy ( $n = 5$ ), and accident or disease ( $n = 3$ ). All parents spoke English. One child was excluded after being placed in foster care.

Twenty-four intervention group families (27 children, of which 4 were girls) and 20 wait-list control group families (20 children, of which 6 were girls) were available at preintervention. Thirty-two children from 29 families (17 intervention, 15 control) participated at postintervention (33% attrition) and 15 intervention children remained at 6-month follow-up (44% attrition). The attrition rate was not significantly different across groups at postintervention,  $\chi^2(1, N = 48) = 0.96, p = .33$ . This attrition is comparable with reviews of previous research on treatment of child behavior problems (Kazdin, 2005) and is less than the 43% postintervention attrition reported by Hudson et al. (2003) in their community-based study of children with developmental disabilities. Ten intervention and 11 control-group fathers participated, with 8 intervention fathers remaining at follow-up. Mothers remaining at postintervention reported more dysfunctional parenting styles at preintervention than those that dropped out ( $M_{\text{dropout}} = 2.73, SD = .51$ ;  $M_{\text{remain}} = 3.26, SD = .60$ ),  $t(41) = -2.55, p < .05$ . Fewer intervention group children with a known disability ( $n = 5, 33\%$ ) remained at follow-up compared to those that left the study ( $n = 8, 80\%$ ),  $\chi^2(1, N = 25) = 5.23, p < .05$ . Reasons for family dropout included relocations, alternative treatments, family crises, and lack of comple-

**Table 1.** Demographic Data for Intervention and Control Group Children at Preintervention

Variable	Intervention <sup>a</sup>				Control <sup>b</sup>				Group difference
	<i>M</i>	<i>SD</i>	<i>n</i>	%	<i>M</i>	<i>SD</i>	<i>n</i>	%	
Age of the child in years	4.42	0.92			4.21	1.08			$t(31) = .61, p > .05$
Female			3	17.6			5	31.3	$\chi^2(1, N = 33) = 0.36, p > .05$
Child IQ	61.19	14.64	16		63.79	18.58	14		$t(28) = -0.99, p > .05$
Child Adaptive Functioning Quotient	60.59	10.87			58.25	9.39			$t(31) = 0.66, p > .05$
Attendance at preschool or school									$\chi^2(2, N = 33) = 1.19, p > .05$
No attendance			7	41.2			7	43.8	
Part-time			10	58.8			8	50.0	
Full-time			0	0.0			1	6.3	
Use of services from two or more agencies			7	41.2			5	31.3	$\chi^2(1, N = 33) = 0.75, p > .05$
Child health problems			9	52.9			13	81.3	$\chi^2(1, N = 33) = 2.97, p > .05$
Original-couple families			9	52.9			12	75.0	$\chi^2(1, N = 33) = 1.73, p > .05$
Mother's education									$\chi^2(2, N = 33) = 0.89, p > .05$
Less than Grade 10			4	25.0			2	12.5	
Grades 10 through 12			8	50.0			10	62.5	
Grade 12			2	12.5			2	12.5	
College or university			2	12.5			2	12.5	
Parental history of mental health problems			10	62.5			11	68.8	$\chi^2(1, N = 33) = 0.14, p > .05$
Number in the household									$\chi^2(1, N = 30) = 8.77, p < .01$
2 to 4			5	35.7			8	57.1	
4 to 9			14	87.5			2	12.5	

<sup>a</sup>*n* = 17. <sup>b</sup>*n* = 15.

tion of assessments. One family dropped out of the intervention because they perceived it as inappropriate for their child's needs. Intervention-group children were more likely to live in homes with four or more family members than control-group children,  $\chi^2(1, N = 30) = 8.77, p < .01$ . There were no other group differences on preintervention demographic variables (see Table 1).

## Measures

### Stanford-Binet Intelligence Scale (4th ed).

The composite score of this scale assessed child cognitive functioning (Thorndike, Hagen, & Sattler, 1986). This score has excellent internal consistency ( $rs = .95$  to  $.99$ ) and test-retest reliability ( $r = .91$ ) for preschoolers. Criterion validity is satisfactory based on correlations with other intelligence tests for children ( $rs = .44$  to  $.78$ ; Sattler, 2001). This test is frequently used in the assessment of children with disabilities because of the large number of items available for low-functioning children (Sattler, 2001).

**Vineland Adaptive Behavior Scales.** The Interview Edition Survey Form of this scale (Sparrow, Balla, & Cicchetti, 1984) assesses personal and social skills in disabled and nondisabled individuals. The Adaptive Behavior composite score is reliable, with internal consistency coefficients ranging .89 to .98, median test-retest reliability over 2 to 4 weeks at .88, and a median interparent reliability of .74 (Sparrow et al.,

1984). The composite score correlates significantly with other relevant measures such as the Scales of Independent Behavior ( $r = .90$ ), measures of intelligence ( $r = .31$ ), and rates of regular school integration ( $r = .26$ ) in preschool children with developmental disabilities (Roberts, McCoy, Reidy, & Crucitti, 1993). Trained research assistants interviewed the primary caregiver.

### Developmental Behavior Checklist Parent Version.

This test (Einfeld & Tonge, 1992) assesses mothers' and fathers' perceptions of behavior problems in children with developmental disabilities. This 96-item scale includes six subscales: Disruptive, Self-Absorbed, Communication Disturbance, Anxiety, Autistic Relating, and Antisocial. The total behavior problem score (TBPS) was used, with a clinical cutoff of 46. This score has 85% specificity and 83% sensitivity with regard to expert clinician judgment of whether the child has a psychiatric diagnosis. A change score of 17 or more was used to assess reliable change (Einfeld & Tonge, 1992). In a sample of 1,093 Australian children ages 4 to 18 years with intellectual disabilities, Cronbach's  $\alpha$  for the TBPS was .94, the interclass correlations between mothers and fathers ( $n = 42$ ) was .80, and the test-retest reliability was .83 over a 2-week period (Einfeld & Tonge, 1996a). The interparental correlation for our sample was .51 ( $n = 34$ ). In past samples of children with developmental disabilities, the TBPS has correlated highly with measures of mal-

adaptive behavior from the American Association on Mental Deficiency Adaptive Behavior Scales ( $r = .86$ ) and the Scales of Independent Behavior ( $r = .70$ ), and with child psychiatrist ratings of psychopathology ( $r = .81$ ; Einfeld & Tonge, 1996a).

### **The Family Observation Schedule–Revised III.**

This test (Sanders et al., 1996) assesses primary caregiver–child interactions in home and community settings (e.g., independent play, mealtime, shopping). Parents nominated 3 difficult settings from a 16-setting checklist. Target and generalization settings were randomly selected from family choices. Observations were made blind to the child's group status. The Family Observation Schedule–Revised III has discriminated between children (ages 2 to 7 years) with and without conduct problems (Sanders, Dadds, & Bor, 1989) and was sensitive to the effects of intervention (Sanders & Christensen, 1985).

Child noncompliance and oppositional behaviors (e.g., complaining, negative physical behavior) were coded, plus appropriate verbal interactions and engaged activity. Five positive parental behaviors were coded: two behaviors antecedent to the child's behavior (i.e., specific instructions and questions) and three behaviors consequent to the child's behavior (i.e., praise, positive contact, and positive social attention). Parental negative behavior (i.e., negative physical contact or social attention, negatively worded questions or instructions, and vague instructions) was also coded. A 15-sec interval coding system cued via an earphone was used for the two 20-min in-vivo observation periods undertaken for each of the target and generalization settings.

This method was chosen because the behaviors occurred with low to moderate frequency and did not always have clear-cut beginnings and endings (Sattler, 2002). Occurrence frequency scores were calculated, then divided by the total number of observation intervals, to obtain three child and six parental behavior scores.

Research assistants were trained for 20 hr to reach at least 80% agreement. Reliability checks were conducted on 25% of the observations. Kappa interobserver agreements collapsed across both settings were good to excellent for child behaviors (noncompliance  $\kappa = .83$ ; oppositional behavior  $\kappa = .82$ ; appropriate behavior  $\kappa = .85$ ) and for parent behaviors (negative behavior  $\kappa = .79$ ; positive specific instructions  $\kappa = .73$ ; positive questions  $\kappa = .87$ ; praise  $\kappa = .90$ ; positive contact  $\kappa = .86$ ).

**Parenting Scale.** The Parenting Scale (Arnold, O'Leary, Wolff, & Acker, 1993) is a 30-item measure of dysfunctional parenting discipline. This scale has three factors. Laxness (11 items) measures permissive discipline and a tendency to give in to misbehavior;

Overreactivity (10 items) measures authoritarianism favoring punitive, and controlling methods of discipline; and Verbosity (7 items) measures overly long reprimands and few meaningful consequences for misbehavior. Good internal consistency was reported in a sample of 168 mothers of 2- to 4-year-olds (Laxness = .83, Overreactivity = .82, and Verbosity = .63), as was test–retest reliability over a 2-week period (Laxness = .83, Overreactivity = .82, and Verbosity = .79; Arnold et al., 1993). Also, in this sample, Laxness and Overreactivity subscales discriminated between clinic and nonclinic groups, and all subscales correlated significantly with the Child Behavior Checklist (.22 to .54) and Locke–Wallace Marital Adjustment measure (–.50 to –.35; Arnold et al., 1993). The subscales were significantly related to observed discipline mistakes (Laxness  $r = .61$ , Overreactivity  $r = .65$ , Verbosity  $r = .53$ ) and child misbehavior (Laxness  $r = .62$ , Overreactivity  $r = .69$ , Verbosity  $r = .46$ ; Arnold et al., 1993). Both parents completed the scale independently where available and higher scores indicated more dysfunctional parenting practices. Our sample revealed non-significant interparental correlations for all subscales ( $n = 33$ ; Laxness  $r = .29$ , Overreactivity  $r = .10$ , Verbosity  $r = .14$ ) and alpha coefficients that ranged from poor to good, with Verbosity being the least internally consistent (Mothers: Laxness  $r = .77$ , Overreactivity  $r = .81$ , Verbosity  $r = .39$ ; Fathers: Laxness  $r = .78$ , Overreactivity  $r = .72$ , Verbosity  $r = .52$ ).

Jacobson and Truax's (1991) procedure for establishing clinical significance was used with clinic and nonclinic group data presented by Arnold et al (1993). Clinical cutoffs at the point halfway between the means of these two significantly different samples were established for Laxness (cutoff = 2.8), Overreactivity (cutoff = 2.7), and Verbosity (cutoff = 3.25).

**Depression–Anxiety–Stress Scale.** The 14-item stress subscale (Lovibond & Lovibond, 1995) measured parental stress relating to continuing difficulties in meeting the demands of life, in the previous week. Items are scored on a 4-point scale ranging from 0 (*did not apply to me at all*) to 3 (*applied to me very much*), summed and converted to Z scores. Scores above 19 indicate moderate to severe levels of stress based on normative data collected from 1,044 men and 1,874 women age 17 to 69 years (Lovibond & Lovibond). Both parents completed the scale where available. Internal consistency from the normative data ( $\alpha = .90$ ), 437 adults ( $M$  age = 36 years) presenting for anxiety treatment ( $\alpha = .93$ ; Brown, Chorpita, Korotitsch & Barlow, 1997), plus the mothers ( $n = 43$ ,  $\alpha = .95$ ) and fathers ( $n = 31$ ,  $\alpha = .91$ ) in this study was good, as was test–retest reliability ( $r = .81$ ) reported by Brown et al. Correlations with the Beck Depression Inventory (intraclass correlation coefficient = .60) and the Beck Anxiety Inventory (intraclass correlation coefficient =



.64) in a sample of 717 university students was adequate, and the Stress subscale differentiated patients with generalized anxiety and mood disorders from other diagnostic groups (Lovibond & Lovibond, 1995).

**Client satisfaction.** A 38-item client satisfaction questionnaire included 11 items on parent satisfaction, (e.g., “The program helped me manage my child’s behavior”), 27 items that rated the helpfulness of each of the behavior management strategies (e.g., incidental teaching, timeout), and 6 items related to SSTP resources (e.g., “The *Stepping Stones Parenting Workbook* was helpful”). Satisfaction items were rated on a 5-point Likert scale ranging from 1 (*totally disagree*) to 5 (*totally agree*). Strategy and resource items were rated from 1 (*not at all helpful*) to 4 (*very helpful*) or 5 (*did not attempt/use*).

### Intervention

**SSTP.** The SSTP (Sanders et al., 2003a) is an individually delivered 10-session parenting program that incorporates sessions on the causes of child behavior problems, 14 strategies for encouraging children’s development (e.g., quality time, communicating with children, activity schedules), and 11 strategies for managing misbehavior (e.g., diversion to another activity, setting rules, quiet time, and time-out). Families received an *SSTP Family Workbook* (Sanders, Mazzuchelli, & Studman, 2003b) and watched video demonstrations of positive parenting skills (Sanders, 2003). Parent’s self-selected goals and strategies to practice in clinic appointments and home observation sessions based on preintervention assessment results and discussion with therapists. Parents were helped to identify high-risk situations and use a seven-step planned activity training routine to enhance generalization and maintenance. Clinic sessions averaged 120 min, and home visits (three to four per family) lasted 40 to 60 min.

Following completion of the standard SSTP, families with additional needs took part in one or two Enhanced Triple P modules (Sanders, Markie-Dadds, & Turner, 1998), *Partner Support* and *Coping Skills*. These included a review and feedback session, plus three 90-min sessions focusing on marital communication and parenting teamwork or mood management and coping skills.

**Wait-list condition.** Families assigned to this condition received their usual early intervention services, including individualized programs for speech and occupational therapy, physiotherapy, self-help, and preeducational skills as required, but no assistance with behavioral support. Control-group families were offered SSTP after postintervention assessments as an ethical requirement of DSC.

### Procedure

Institutional Review Board approval was given by the Curtin University and DSC Human Ethics Committees. Recruitment of families who reported elevated levels of behavior problems in their preschool child with disabilities was conducted via advertisements through DSC’s Northern Region early intervention team over a 3-year period from 1998 to 2000. Parents provided consent for themselves and their children to participate, in accordance with the Australian National Health and Medical Research Council guidelines for working with minors. Parents received written and verbal information about the project from DSC staff when they were recruited. They were informed of the research and intervention processes and that they could withdraw at any time without affecting their regular DSC services. They were told that they had a 50% chance of receiving the program immediately or waiting 4 months. Once parents consented, families were randomized to intervention or wait-list control groups by a university-based researcher not involved in recruitment. Research assistants blind to family group status visited parents in their homes to complete questionnaires and behavioral observations with primary caregiver–child dyads (one father).

Intervention group families received SSTP within 2 weeks of the completion of the assessments. All families received the positive parenting module of the program. Participation in additional modules depended on the family’s individual needs and preintervention assessment results. Eight couples received the *Partner Support* module, and 10 families (8 mothers and 3 fathers) received the *Coping Skills* module. Interventions were carried out by one male clinical psychologist and one female developmental psychologist, each with a master’s degree, employed by DSC. These therapists were involved in the development of SSTP and received 40 hr of training from Matthew Sanders, the author of the Triple P intervention. The psychologists received regular supervision and completed protocol adherence checklists, recording the activities completed in each session. The mean percentage of content covered for the intake session and 10 standard SSTP sessions ranged from 67% to 98% ( $M = 82.22\%$ ). The range of content completed for the coping skills sessions was 92% to 100% ( $M = 96.26\%$ ) and for the partner support, 97% to 100% ( $M = 98.87\%$ ).

Postintervention questionnaires and observations were conducted in the same manner as preintervention within 2 weeks of completion of the interventions. Control families completed the postintervention assessment approximately 16 weeks after preintervention and were then offered the SSTP intervention. Twelve families accepted. Intervention families only completed assessments and observations at 6-month follow-up.

## Results

Separate mixed model multivariate analyses of variance or analysis of variance with independent variables, time (pre- and postintervention), and treatment (intervention and control) were used to assess intervention effects for mothers and fathers (see Table 2). Univariate analyses were conducted in accordance with a priori hypotheses. Where significant time or group by time interaction effects were found, paired *t* tests investigated the direction of effects and maintenance at follow-up. Two-tailed *p* values with  $\alpha = .05$  are reported for all analyses, except the Developmental Behavior Checklist Parent Version and observations of child behavior. These analyses included two intervention families with more than one child per family: one family with two children and one with three children. Although this introduces interdependence into the data, in each case the specific behavior problems for each sibling were different, and different target and generalization settings were chosen for observations. Rather than remove siblings from the analyses, thereby reducing the power, a more conservative  $\alpha = .01$  for interaction effects was used to reduce the possibility of Type 1 errors due to data interdependence (Stevens, 1992). Bonferroni corrections were applied to paired *t* tests. Intention-to-treat analyses were conducted for significant primary analyses, replacing missing data with the last observed response, a common and conservative method to estimate intervention effects (Hollis & Campbell, 1999).

### Child Behavior

**Parental report.** Maternal and paternal preintervention TBPS means for both groups (see Table 2) were above the clinical cutoff, but mothers in two-parent intervention group families rated their children's behavior problems as more severe than fathers,  $t(14) = 3.45, p < .01$ . Fourteen (82.4%) intervention and 11 (73.3%) control-group children had maternal TBPS scores above the clinical cutoff.

Mothers' TBPS indicated significant time,  $F(1, 30) = 4.25, p < .05, \eta^2 = .12$ , and time by group,  $F(1, 30) = 8.51, p < .01, \eta^2 = .22$ , effects. Intervention mothers reported significant reductions in behavior problems from pre- to postintervention,  $t(16) = 3.67, p < .01$ , and from preintervention to 6-month follow-up,  $t(14) = 3.19, p < .05$ . Control mothers reported no significant changes. No significant effects were found for fathers. Intention-to-treat analyses confirmed the significant time by group interaction,  $F(1, 43) = 6.18, p < .05, \eta^2 = .13$ , and significant reductions in intervention group behavior problems from pre- to postintervention,  $t(26) = 3.24, p < .01$ , and from preintervention to 6-month follow-up,  $t(26) = 2.77, p < .05$ .

**Behavioral observations.** Observations of child behavior in target settings (Table 3) revealed no significant effects for noncompliance. However, significant time,  $F(1, 30) = 6.23, p < .05, \eta^2 = .17$ , and time by group,  $F(1, 30) = 8.90, p < .01, \eta^2 = .23$ , effects were found for oppositional behavior. Intervention children's oppositional behavior decreased from pre- to postintervention,  $t(15) = 2.67, p = .05$ , and from preintervention to follow-up,  $t(15) = 2.98, p < .05$ . No changes occurred for control-group children. There were significant time effects only for appropriate behavior,  $F(1, 30) = 5.15, p < .05, \eta^2 = .15$ , indicating increases in appropriate behavior for both groups. Intention-to-treat analysis confirmed time by group effects for oppositional behavior,  $F(1, 40) = 5.83, p < .05, \eta^2 = .13$ , and reductions in intervention-group children's oppositional behavior at postintervention,  $t(24) = 3.06, p < .05$ , and follow-up,  $t(24) = 3.30, p < .05$ .

Observations of child behavior in the generalization settings (Table 3) showed significant time,  $F(1, 30) = 5.59, p < .05, \eta^2 = .16$ , and time by group effects,  $F(1, 30) = 7.80, p < .01, \eta^2 = .21$ , for noncompliance. Significant reductions in noncompliance for the intervention group occurred at postintervention,  $t(16) = 3.69, p < .01$ , and follow-up,  $t(15) = 2.70, p < .05$ , compared to preintervention, whereas noncompliance in the control-group children remained stable. For oppositional behavior, a significant time effect,  $F(1, 30) = 9.50, p < .01, \eta^2 = .24$ , indicated that both groups reduced oppositional behavior over time. There were no significant effects for appropriate child behavior, which remained stable over time. Intention-to-treat analyses confirmed time by group effects,  $F(1, 40) = 6.34, p < .05, \eta^2 = .14$ , for noncompliance and reductions in intervention children's noncompliance at postintervention,  $t(24) = 3.56, p < .01$ , and follow-up,  $t(24) = 3.06, p < .05$ .

### Parental Behavior

**Parental report.** All preintervention means for parental discipline styles were higher than the clinical cutoffs (see Table 4), except for control-group fathers' reports of verbosity. There were no significant differences between mothers' and fathers' preintervention scores in either condition.

For mothers, significant time by group effects were apparent for Overreactivity,  $F(1, 27) = 7.96, p < .01, \eta^2 = .29$ , and also time effects for Laxness,  $F(1, 27) = 6.24, p < .05, \eta^2 = .19$ , and Overreactivity,  $F(1, 27) = 9.72, p < .01, \eta^2 = .27$ . Intervention-group mothers became less overreactive,  $t(13) = 3.34, p = .01$ , after the intervention and maintained lower levels from preintervention to follow-up,  $t(11) = 3.97, p < .01$ . No changes occurred for control-group mothers. However, intention to treat analyses did not confirm the time by group interaction.

Measure and Group	Pre						Post						Follow-Up					
	Mother			Father			Mother			Father			Mother			Father		
	M	SD	n	M	SD	n	M	SD	n	M	SD	n	M	SD	n	M	SD	n
Postintervention Time × Group Effects																		
Total Behavior Problems																		
Intervention	67.47	19.02	17	47.25	20.95	12	49.65	24.54	17	42.92	21.11	12	52.73	25.24	15	37.50	30.49	10
Control	64.13	26.52	15	56.64	27.79	11	67.20	27.36	15	61.45	29.89	11	Mother: $F(1, 30) = 8.51$ , $p < .01$ , $\eta^2 = .22$					
Parental Stress																		
Intervention	14.07	10.32	14	7.67	5.70	9	9.14	8.39	14	7.89	6.17	9	9.75	7.46	12	6.62	7.01	8
Control	10.27	7.36	15	11.50	7.00	10	9.93	8.45	15	10.40	7.10	10						

**Table 3.** *Intervention Effects on Observations of Child Behavior*

Measure and Group	Pre						Post						Follow-Up					
	Target			General			Target			General			Target			General		
	M	SD	n	M	SD	n	M	SD	n	M	SD	n	M	SD	n	M	SD	n
Noncompliance Intervention Control	.15	.21	17	.18	.15	17	.12	.24	17	.03	.04	17	.13	.21	16	0.08	.08	16
	.21	.15	15	.12	.13	15	.19	.22	15	.14	.15	15	General: $F(1, 30) = 7.80$ $p < .01, \eta^2 = .21$					
Oppositional Behavior Intervention Control	.29	.32	17	.16	.14	17	.03	.08	17	.03	.04	17	.03	.04	16	0.04	.05	16
	.14	.12	15	.15	.17	15	.17	.22	15	.09	.11	15	Target: $F(1, 30) = 8.90$ $p < .01, \eta^2 = .23$					
Appropriate Behavior Intervention Control	.63	.21	17	.71	.17	17	.85	.24	17	.85	.24	17	.79	.25	16	1.01	.45	16
	.68	.16	15	.73	.21	15	.72	.29	15	.72	.29	15						



**Table 4.** *Intervention Effects on Parenting*

<i>Measure and Group</i>	Pre						Post						Follow-Up					
	Mother			Father			Mother			Father			Mother			Father		
	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>
Laxness																		
Intervention	2.96	.93	14	2.75	.31	10	2.42	0.81	14	1.95	0.54	10	2.25	.78	12	1.89	0.53	8
Control	3.03	.65	15	2.93	.77	11	2.92	0.76	15	2.87	0.52	11						
Overreactivity																		
Intervention	3.59	.77	14	3.24	.67	10	2.79	0.82	14	2.63	1.28	10	2.77	.70	12	2.47	0.95	8
Control	3.37	.79	15	3.38	.64	11	3.33	1.01	15	3.25	0.65	11						
Verbosity																		
Intervention	3.24	.78	14	3.79	.81	10	2.80	0.67	14	2.81	0.98	10	2.63	.74	12	2.77	1.03	8
Control	3.21	.79	15	3.17	.86	11	3.27	0.97	15	3.62	0.54	11						

Father:  $F(1, 19) = 9.95$ ,  
 $p < .01$ ,  $\eta^2 = .34$

Mother:  $F(1, 27) = 7.96$ ,  
 $p < .01$ ,  $\eta^2 = .29$

Father:  $F(1, 19) = 18.82$ ,  
 $p < .001$ ,  $\eta^2 = .50$

Fathers showed significant time by group effects for Laxness,  $F(1, 19) = 9.95, p < .01, \eta^2 = .34$ , and Verbosity,  $F(1, 19) = 18.82, p = .001, \eta^2 = .50$ , but not for Overreactivity. Significant time effects were found for Laxness,  $F(1, 19) = 13.86, p = .001, \eta^2 = .42$ , and Overreactivity,  $F(1, 19) = 6.01, p < .05, \eta^2 = .24$ . Intervention fathers' use of lax,  $t(9) = 4.47, p < .01$ , and verbose,  $t(9) = 3.24, p = .01$ , styles declined significantly from pre- to postintervention and from preintervention to follow-up: Laxness,  $t(7) = 6.34, p < .001$ ; Verbosity,  $t(9) = 2.89, p = .05$ . Control-group fathers used more verbose discipline,  $t(10) = -2.92, p < .05$ , from pre- to postintervention. Intention-to-treat analyses confirmed time by group effects for verbose discipline,  $F(1, 29) = 13.88, p < .01, \eta^2 = .32$ , and declines in intervention fathers' use of these discipline strategies,  $t(17) = 2.99, p < .05$ , from pre- to postintervention and from preintervention to 6-month follow-up,  $t(17) = 3.15, p < .05$ , as well as increases in verbosity for control-group fathers,  $t(12) = -2.78, p = .05$ .

**Behavioral observations.** No significant effects were found for parental positive antecedent behaviors or parental negative behaviors in the target settings (Table 5). However, for parental positive consequences a significant time by group interaction was apparent,  $F(3, 28) = 3.16, p < .05, \eta^2 = .25$ , with univariate time effects for positive social attention,  $F(1, 30) = 5.91, p < .05, \eta^2 = .16$ , and time by group effects for praise,  $F(1, 30) = 8.47, p < .01, \eta^2 = .22$ . Positive social attention increased from pre- to postintervention for both groups. Intervention-group parents praised their children more in the target settings after the intervention,  $t(16) = -2.89, p < .05$ , and from preintervention to

follow-up,  $t(15) = -2.36, p < .05$ , but no significant changes occurred in the control group. Intention-to-treat analyses confirmed the time by group interaction,  $F(1, 40) = 6.44, p < .05, \eta^2 = .14$ , for praise and increases in praise by intervention parents from pre- to postintervention,  $t(24) = -2.70, p < .05$ , and preintervention to follow-up,  $t(24) = -2.47, p < .05$ .

In the generalization settings, there were no significant time or time by group effects for parental negative behavior, positive antecedents, or positive consequences. However, there were significant group effects for both parental negative behaviors,  $F(1, 30) = 11.54, p < .01, \eta^2 = .28$ , and positive consequences,  $F(3, 28) = 3.85, p < .05, \eta^2 = .29$ , with intervention parents engaging in fewer negative behaviors and control-group parents exhibiting more positive consequences at both pre- and postintervention.

### Parental Stress

Normative levels of stress were indicated by preintervention means for mothers and fathers from both groups (Table 2). No significant effects were found for mothers or fathers.

### Clinical Significance

Clinical significance was investigated by the Reliable Change Index (Hawley, 1995; Jacobson & Truax, 1991) using a Reliable Change Index of 1.96 to measure reliable change. At postintervention, 9 (52.9%) intervention-group children experienced reliable behavior change on the maternal TBPS, compared to 3 (20%) control-group children. Two (13.3%) control-group

**Table 5.** Intervention Effects on Observations of Parent Behavior

Measure and Group	Pre				Post				Postintervention Time × Group Effects	Follow-Up			
	Target		General		Target		General			Target		General	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Negative Behavior									Target: $F(1, 30) = 8.47$ , $p < .01$ , $\eta^2 = .22$				
Intervention	.12	.11	.06	.16	.08	.08	.04	.08		.15	.18	.19	.12
Control	.23	.21	.02	.05	.22	.13	.03	.05					
Praise													
Intervention	.02	.03	.04	.06	.09	.10	.06	.09		.07	.07	.08	.08
Control	.05	.07	.05	.06	.03	.05	.03	.04					
Contact +													
Intervention	.10	.11	.17	.18	.17	.26	.12	.18		.10	.12	.12	.21
Control	.16	.19	.27	.22	.18	.27	.17	.22					
Social Attention +													
Intervention	.43	.33	.38	.29	.64	.35	.42	.36	.47	.33	.60	.30	
Control	.48	.26	.57	.28	.50	.37	.61	.31					
Specific Instruction +													
Intervention	.12	.15	.16	.12	.16	.15	.11	.12	.09	.09	.15	.12	
Control	.12	.11	.22	.19	.11	.13	.17	.12					
Question +													
Intervention	.14	.16	.12	.13	.18	.14	.11	.17	.17	.16	.17	.12	
Control	.16	.15	.14	.11	.16	.15	.20	.14					

children's behavior showed a reliable deterioration. Chi-square analysis approached significance,  $\chi^2(1, N = 32) = 3.69, p = .05$ . Eight (53.3%) intervention children maintained reliable improvements at follow-up.

Significantly more intervention (7, 50%) than control-group mothers (1, 6.7%) reported reliable reductions in overreactive discipline at postintervention,  $\chi^2(1, N = 29) = 6.81, p < .05$ . At follow-up, 3 (25%) intervention-group mothers showed reliable change in overreactive discipline, and no mothers reported deterioration. There was a significant difference between the 4 (40%) intervention-group and the zero control-group fathers who reported reliable reductions in laxness at postintervention,  $\chi^2(1, N = 21) = 5.44, p < .05$ . Similarly, significantly more (5, 50%) intervention-group fathers reported reliable reductions in Verbosity compared to control-group fathers who reported no change or an increase (1 father) at postintervention,  $\chi^2(1, N = 21) = 7.22, p < .05$ . At follow-up, 4 (50%) intervention-group fathers showed reliable change from preintervention on both Laxness and Verbosity, and none reported deterioration.

Despite the lack of significant postintervention effects for maternal stress, significantly more intervention-group mothers (4, 28.6%), compared to no control-group mothers, reported reliable reductions in stress at postintervention,  $\chi^2(1, N = 29) = 4.97, p < .05$ . One (6.7%) control-group mother reported a reliable increase. At follow-up, 1 intervention-group mother of three children reported reliable reductions in stress levels from preintervention, and none reported deteriorations.

### Client Satisfaction

Twenty-two parents completed the parent satisfaction questionnaire. Parents rated the program highly ( $M$  range = 4.00–4.73) indicating that they "somewhat agreed" or "totally agreed" with all general satisfaction items relating to SSTP and its effects. The only exception, "My family and friends have commented on changes in me that have occurred as a result of the program," showed a mean rating of 3.09 indicating a neutral response. The strategies with the highest helpfulness ratings were: time-out ( $M = 3.86$ ), backward chaining ( $M = 3.82$ ), behavior charts ( $M = 3.77$ ), giving attention ( $M = 3.73$ ), and response blocking ( $M = 3.68$ ). Mean ratings for resources and methods ranged from "helpful" ( $M = 3.00$ ) for the Every Parent Book to "very helpful" ( $M = 4.00$ ) for the home visits and the SSTP Family Workbook. Parents reported high levels of satisfaction with their therapists (range = 4.36–4.91).

### Discussion

These findings indicate that SSTP was associated with reductions in child behavior problems. Parent be-

havior also changed, although the changes were not as consistently observed as changes in child behavior. SSTP was associated with mothers becoming less overreactive and with fathers using fewer lax and verbose discipline strategies. Independent observers noted parents praising their children more in target settings. These behaviors were all maintained at follow-up.

These results support the findings of single-participant studies of BFI with young children with disabilities that have reported reductions in child behavior problems and enhancement of positive parenting behaviors (Gavidia-Payne & Hudson, 2002; Roberts et al., 2003), and they support studies of typically developing preschool children (Bryant et al. 1999; Feinfield & Baker, 2004; Reid et al., 2004; Webster-Stratton et al., 2004). They indicate that parents and children were able to apply their skills to new situations and to continue using them after the formal intervention had ceased. These results are also consistent with the findings of previous trials of the Triple P interventions (Sanders, 1999) from which this intervention has been derived.

It is interesting that mothers and not fathers reported significant reductions in child behavior problems for the intervention group. Comparisons of both parents have not been made in previous intervention research with young children with developmental disabilities (e.g., Hudson et al., 2003), although they have been compared in studies of typically developing children (e.g., Webster-Stratton et al., 2004). The differential response of mothers and fathers may be related to the small number of fathers involved in the study ( $n = 21$ ), leading to reduced power to find effects. Also, intervention-group fathers initially rated their children's problems as less severe than mothers. Because the primary caregiver in all cases except one was the mother, fathers may have had less opportunity to observe changes in their children's behavior across settings.

In accord with previous research, this study found an increase in parent's positive behavior, praise, and social attention in target settings (Harrold et al., 1992; Huynen et al., 1996; Lowry & Whitman, 1989). However, unlike Harrold et al. and Huynen et al., improvements in parent instructions and contingent responding were apparent in mother's and father's reports of their own discipline style but not in the behavioral observations. Although these changes in parenting styles were maintained at follow-up, and all changes were clinically reliable, such changes were not observed in target or generalization settings. Furthermore, control-group parents also displayed an increase in positive social attention from pre- to postintervention. Parental behavior changes observed in this study were more limited than those of previous single-participant studies (Harrold et al., 1992; Huynen et al., 1996; Lowry & Whitman, 1989). However, few previous studies with young children with disabilities have used control groups or

research designs that could isolate these effects or have asked parents to report on their own behavior. Without a control group, it is not possible to determine if changes in observed parental behavior are the result of intervention or naturally occurring processes, such as was found for rates of positive social attention in this study.

The limited changes in parent's behavior in target settings and lack of changes in generalization settings may have been the result of sampling problems. The independent observations assess a small sample of parental behavior over a time frame of 1 week, whereas the Parenting Scale asks parents to reflect on their parenting style over the past 2 months. This takes into account many exemplars of parenting behavior, which may represent more consistent behavior change. This explanation is to some extent supported by the significant proportions of mothers and fathers reporting reliable changes in aspects of their discipline style compared to the control group at postintervention. However, it is also possible that parent report may be biased by their experience of the intervention. Future research should continue to use multiple measures of parental behavior.

It is interesting that intervention-group fathers reported significant changes in their own parenting behaviors but no corresponding changes in child behavior. Indeed, the effect sizes for fathers' parenting style changes were larger than those for mothers. In addition, the effect for fathers was robust following the intention-to-treat analyses. Previous intervention studies with children with disabilities have not investigated fathers' parenting style (Harrold et al., 1992; Hudson et al., 2003; Huynen et al., 1996; Lowry & Whitman, 1989; Sanders & Plant, 1989). However, studies of typically developing children have found large effects for reducing fathers' negative parenting style following BFI interventions (Webster-Stratton et al., 2004).

The effect of SSTP on reducing family stress was limited. No group treatment effects were found for mothers or fathers, and results of the analysis of clinical significance indicated a preventative effect for mothers, with intervention mothers maintaining or reducing normal levels of stress. These results were not as robust as other studies of SSTP for children with disabilities (e.g., Hudson et al., 2003), and there was no significant maintenance at follow-up. Therefore, replications by future studies are needed before conclusive statements can be made on the usefulness of SSTP for reducing family stress.

The strengths of this study include the use of a randomized control design, the use of multiple sources of information, and the inclusion of child, parent, and family outcomes. In addition, the integrity of implementation of the intervention program was monitored and social validity data indicated that families were very satisfied with the SSTP intervention, resources,

and therapists. However, the sample size was small, with low numbers of fathers. This limits the power of the evaluation to find effects, particularly if these effects represent small or moderate changes. This also affects the chances of a Type 2 error given the number of primary analyses conducted. In addition, there was significant attrition. Rates of attrition did not differ between intervention and control groups, and care was taken to determine how participants who remained in the study differed from those families that dropped out. The attrition in this study is comparable with previous research on children and adolescents referred for treatment of behavior problems (Hudson et al., 2003; Kazdin, 2005). Attrition was not generally associated with the SSTP intervention. Only one family reported this to be the reason for discontinuing participation with the research project. It is more likely that the rigorous assessment protocol served as a disincentive for these families who experienced very busy lives. However, the high rate of attrition in the context of the small sample size is a limitation, particularly in terms of investigating mechanisms of treatment effects.

This study investigated the efficacy of a BFI for preschool children with developmental disabilities and behavioral problems. The SSTP intervention was effective in reducing child behavior problems and enhancing mothers' and fathers' style of discipline. These changes were maintained at 6-month follow-up. Hence, SSTP can be seen as a promising BFI for families of children with developmental and behavioral problems. However, it is important that controlled trials with larger sample sizes and better attention to attrition are conducted to confirm these results. In addition, it is important to investigate the mediators of treatment effects. It is unclear what aspects of the intervention are the active components, or which variables result in the positive behavioral outcomes for children with disabilities. Moderators of treatment effects also need to be investigated. Factors such as parental psychopathology, socioeconomic status, and problem severity have been found to affect treatment outcomes for typically developing children (Snell-Johns, Mendez, & Smith, 2004). However, these factors have not been considered in families also coping with child disability. In addition, the impact of the enhanced modules on *Coping Skills* and *Partner Support* was not assessed in this study because of the small sample size. Future studies need to tease out the effect of these additional modules for families of young children with disabilities.

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