

# Feasibility and Acceptability of a Compressed Caregiver Training Program to Treat Child Behavior Problems

Behavior Modification

1–25

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## Abstract

In an effort to address some of the criticisms of Behavioral Parent Training programs (BPT; high attrition, reliance on caregiver report measures), the current study examined the feasibility, acceptability, and outcome of an intensive behavior treatment program (120-minute sessions for 5 days/week over the course of 2 weeks). Using a changing criterion single case experimental design, 12 children (*M* child age = 4.9 years) and their primary caregivers completed the 2-week function-based intervention procedure designed to increase children's frustration tolerance via a wait training procedure based on the principles of applied behavior analysis. Using both direct observation and standardized measures, results indicated that the treatment was effective in reducing childhood behavior problems, both within and between appointments (Cohen's *d*s = 3.2 and 1.37, respectively). Preliminary evidence suggests that a compressed treatment package designed to train caregivers in function-based intervention strategies is feasible and acceptable.

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behavioral parent training, externalizing behavior problems, intensive treatment, applied behavior analysis

**Introduction**

Externalizing behavior problems (e.g., aggression, tantrums, and noncompliance) in young children can be early predictors for more significant concerns later in life, including disruptive behavior and conduct disorders, mood disorders, and substance abuse (Kim et al., 2013; Olson et al., 2002). Behavioral parent training (BPT) programs (i.e., Parent-Child Interaction Therapy [PCIT]; Eyberg et al., 1995; *The Incredible Years*; Webster-Stratton, 1996; *Strategies to Enhance Positive Parenting* [STEPP]; Chacko et al., 2008) are among the most frequently used interventions to address behavior problems in children (Maughan et al., 2005). Clinicians teach caregivers to define behavior problems, implement assessment measures, and provide treatment recommendations to address concerns (Shaffer et al., 2001). In BPT, caregivers are the mediators for their children's challenging behavior given their role in the consequences that maintain them (Maughan et al., 2005). Many of these programs teach caregivers to modify their responses to their child's behavior in order to create change; these strategies often include increasing positive interactions and setting limits. For instance, in PCIT, caregivers are coached to attend positively and predictably to their child's behaviors. Direct coaching from the clinician is used to teach the parent positive communication skills thought to reinforce the child's appropriate behavior, while limiting attention around negative behavior (Thomas et al., 2017). PCIT has been found to be a highly effective caregiver training program, with a recent meta-analysis of 26 studies including 1,144 participants suggesting statistically significant reductions in child externalizing behavior, noncompliance to parent requests, and parent stress (Thomas et al., 2017).

Despite its emphasis on general behavioral principles to improve outcomes, there are some limitations associated with BPT programs, including negative treatment outcomes (Assemany & McIntosh, 2002), premature termination (Forehand et al., 1983), poor treatment engagement (Miller & Prinz, 1990), and failure to maintain progress (Serketich & Dumas, 1996). In their review of 262 studies involving behavioral parent training, Chacko et al. (2016) noted a total dropout rate of 51% of participants, and attributed poor caregiver engagement to poor outcomes. As a means of improving engagement in caregiver-based treatment programs, one emphasis has focused on the effects of rapid behavior reduction following the

implementation intervention procedures (e.g., Lieneman et al., 2019; Mersky et al., 2015). Similarly, examples of time-limited interventions to quickly reduce presenting problems exist throughout the behavior literature (e.g., Family Check Up; Dishion et al., 2003; iPCIT; Graziano et al., 2020), obsessive-compulsive disorder (Storch et al., 2007), and selective mutism (Cornacchio et al., 2019). Preliminary research on these types of condensed programs suggests that the impact on outcomes related to attrition may be somewhat mitigated (e.g., Graziano et al., 2015; Whiteside & Jacobsen, 2010). However, many of these studies do not report data on rates of child problem behavior within or between treatment sessions beyond parent report (T. Smith & Iadarola, 2015), so additional research incorporating more objective measures (i.e., trained observer data collection) of outcome variables is warranted.

Perhaps relatedly, research on BPT has primarily evaluated outcomes at the group level, which presents some challenges to understanding the control of the intervention over problem behavior at the individual level (Maughan et al., 2005). Conversely, the behavior analytic approach to intervention focuses on the individualized connection between behaviors and their controlling environmental variables. Once a behavior's cause or "function" is identified, appropriate programming can be designed to improve maladaptive responses through function-based treatment (S. W. Smith et al., 2007). A meta-analysis of 213 studies with behavioral interventions for reducing problem behavior found that function-based treatments were significantly more effective in reducing problem behavior than those that were not function-driven (Heyvaert et al., 2014). Results from this meta-analysis suggests that one approach to improving outcomes in behavioral parent training interventions is to utilize function-based single-case design as part of the "treatment package." Behavior analytic interventions can examine treatment effects within participants via single case experimental designs (SCEDs) to ensure accountability for successful outcomes. This method of evaluation may be particularly important for interventions involving caregivers as change agents: parent report may be subject to expectation biases, which could affect the magnitude of reported behavior change (Ciesielski et al., 2020). Thus, it may be useful to include multiple outcome measures to evaluate treatment effectiveness, such as direct observation measures of function-based intervention procedures from trained observers in addition to parent report (Atkeson & Forehand, 1978).

Within the function-based behavior literature, behavior reduction programs often target acquisition of specific skills to reinforce adaptive behaviors in addition to creating behavior reduction goals. Specific examples include teaching simple high-probability requests to receive preferred

reinforcers in the context of extinction for challenging behavior (i.e., functional communication training [FCT]; Carr & Durand, 1985; Fisher et al., 1993; Worsdell et al., 2000), or teaching children to tolerate delays or denials to reinforcement (Ghaemmaghami et al., 2016; Hanley et al., 2007; Schweitzer & Sulzer-Azaroff, 1988). However, many programs in the applied behavior analytic literature can be both time-intensive and cost-prohibitive. For instance, Hanley et al. (2014) described an efficient delay and denial tolerance program that averaged 27 visits, ranging from 22 to 32 visits. As previously mentioned, there may be a cost to protracted treatment courses in the form of attrition and/or failure to maintain treatment gains. Finally, while the efficacy of many function-based treatments have been well established through years of published research, there is a relative dearth of empirical support for its effectiveness in applications outside of controlled treatment environments (Ghaemmaghami et al., 2021).

The purpose of the present study is to determine the feasibility and acceptability of a compressed, protocol-driven, function-based intervention for childhood behavior problems. Development of the current intervention package was informed by previous research highlighting the value of both rapid symptom reduction and a brief treatment format to reduce barriers to successful PMT outcomes (e.g., Graziano et al., 2015). Specifically, Graziano et al. (2015) compressed the procedures of Parent-Child Interaction Therapy into 90-minute sessions across two consecutive weeks and found significant improvements in caregiver attendance and satisfaction. Based on those findings, the procedures described in the current study were delivered in 10 or fewer 120-minute treatment sessions, inclusive of the functional assessment process and delivery of standardized measures. The authors hypothesized that the behavioral intensive treatment program (BITP) would be feasible, as evidenced by low attrition and high caregiver engagement, acceptable, as measured by a caregiver satisfaction measure, and produce clinically and statistically significant reductions in target problem behavior.

## Method

### *Participants*

Participants were 12 children between the ages of 3 and 7 ( $M=4.9$ ,  $SD=0.79$ ). Specific information regarding participant characteristics are listed in Table 1. Participants were recruited between January and August 2021 from a large volume (i.e., approximately 1,000 patients seen per year) outpatient treatment program for children with behavioral challenges. The outpatient treatment program is part of a hospital-based psychology department, and

**Table 1.** Demographic Information for all Participants.

Name	Age	Sex	Race	Diagnosis	Insurance	Family background	Participating parent	Target(s)	Previous treatment
Judah	5	M	B	ADHD-C	MA	Low-to-middle dual-parent income	Caregivers participated consecutively	Tantrum	None
Elliott	5	M	B	ADHD-C	MA	Low-to-middle single-parent income	Mother only	Aggression, Tantrum	None
Mildred	4	F	B	None	MA	Low, single parent income	Mother only	Tantrum	None
Daniel	5	M	W	None	Commercial	Middle two-parent income	Mother participated in all sessions; Father participated for two appointments	Aggression, Tantrum	None
George	4	M	W	None	MA	Middle dual-parent income	Both caregivers participated concurrently	Tantrum	None
Nevil	4	M	B	None	MA	Middle dual-parent income	Both caregivers participated consecutively	Tantrum	None
Xavier	6	M	B	ADHD; Vision Loss	MA	Middle dual-parent income	Both caregivers participated consecutively	Aggression, Tantrum	> 1 year (39 appts)
Washington	4	M	W	None	Commercial	Middle dual-parent income	Both caregivers participated consecutively	Aggression, Tantrum	> 1 year (15 appts)
Loren	6	F	W	None	Commercial	Middle dual-parent income	Father only	Tantrum	> 1 year (8 appts)
Jed	6	M	W	ADHD-C	MA	Middle dual-parent income	Both caregivers participated concurrently	Aggression, Tantrum	> 1 year (22 appts)
Chris	5	M	B	None	MA	Low, single-parent income	Mother only	Aggression, Tantrum	> 1 year (19 appts)
Chuck	5	M	W	ADHD-C	Commercial	Middle dual-parent income	Both caregivers participated concurrently	Aggression, Tantrum	> 1 year (29 appts)

Note. M= male; F= female; B= Black; W= White; MA= Medicaid; appts= number of behavioral therapy appointments.

receives referrals from community physicians, schools, and internal providers. Consistent with a prospective controlled consecutive case series design (Hagopian, 2020), participants were assigned to receive the treatment procedure described below based on their clinical presentation a priori. Specifically, participants were included if they were between the ages of 2 to 7 at the time of admission, if they engaged in some form of externalizing behavior (i.e., aggression, disruptive behavior, tantrums, etc.), and had not been previously diagnosed with an autism spectrum disorder or intellectual disability. In addition, at least one caregiver was required to be able to attend appointments daily for 2 weeks. As the current study was conducted as part of regular outpatient mental health services, inclusion criteria were left intentionally broad to capture a representative sample of families presenting for treatment of childhood behavior problems. Families who either (1) had no previous experience with behavioral therapy or (2) who had received traditional outpatient behavior services for a year or longer were contacted by the first author and given information about the nature of the condensed treatment program. This process occurred on a first come, first served basis until 12 participants were enrolled. In total, of the 18 families contacted for inclusion of the current study, three declined to participate due to scheduling challenges, one was unable to attend due to an inpatient hospital admission to address severe behavior, and two did not return the message left on their voicemail. As noted in Table 1, all participants' families were covered by insurance, and as a result out-of-pocket costs to each family were minimal (i.e., no more than \$20 copay per appointment for those with commercial insurance).

## Measures

Daily Behavior Rating Scale (BRS) is a one-item question measured on a 0-to-10 Likert scale (0–3=*mild issues*, 4–7=*moderate issues*, and 8–10=*severe issues*). At the beginning of each appointment, caregivers rate their impression of the functional impairment caused by their child's problem behavior since the previous appointment.

Text Message Behavior Rating is a one-item question sent to caregivers via text message every day at a time of their choosing. The purpose of this tool is to prompt caregivers to provide a frequency count of target problem behavior at the end of each day. Text prompts query the frequency of occurrence of each patient's individualized target behavior (e.g., "how many times did you child engage in aggression today?"). Caregivers respond by texting the number that corresponded to their daily observations of their child's behavior, which is automatically recorded and graphed on a de-identified database.

Eyberg Child Behavior Inventory (ECBI; Eyberg & Pincus, 1999) is a validated 36-item caregiver rating measure used to capture problematic behaviors of childhood. The “intensity scale” measures the frequency of behavior problems and the “problem scale” measures the degree to which the caregiver perceives a specific behavior as a problem. The test-retest reliability on both scales has been found to be acceptable ( $\alpha = .86$  for intensity scale;  $.88$  for problem scale), and the discriminative validity has been shown identify significant difference between non-referred, and conduct-disordered children (Eyberg, 1978).

Behavior Assessment System for Children—Third Edition (BASC-3; Reynolds et al., 2015) is a questionnaire designed to solicit a rating from caregivers about observable behaviors that have occurred over the past 6-month. Clinical scales include Hyperactivity, Aggression, Conduct Problems, Anxiety, Depression, Somatization, Atypicality, Withdrawal, and Attention Problems. Adaptive scales include Adaptability, Social Skills, and Leadership. Each scale yields a mean *T*-score of 60 and standard deviation of 10. Adequate reliability and validity have been shown for each edition of the measure (i.e., alpha coefficient  $\geq .80$ ; Altmann et al., 2018).

The Parenting Stress Inventory—Fourth Edition, Short Form (PSI-4-SF; Abidin, 2012) is a caregiver-report questionnaire that solicits information about the levels of stress caused by caregiver-child interactions on a 4-point Likert Scale. Domains include caregiver distress, parent-child dysfunctional interaction, and difficult child. Reliability coefficients across domains were found to contain high degree of internal consistency (i.e., Cronbach’s  $\alpha = .9-.91$ ; Abidin, 2012).

Caregiver Acceptability Questionnaire is a 7-item measure designed to assess caregivers’ satisfaction regarding (1) program length, (2) skills learned to manage problem behavior, (3) child progress. Respondents are asked to respond to questions using a 5-point Likert scale, ranging from 1 = strongly disagree to 5 = strongly agree.

### *Direct Observation, Data Collection, and Response Definitions*

The primary dependent variables were child problem behavior, functional communication, and waiting behavior. Responses per minute were used to analyze problem behavior; number of opportunities correct was used to analyze independent requesting, and duration was used to analyze appropriate waiting. In baseline, all direct measures were collected in 5-minute sessions. In the treatment evaluation, data were collected on a trial-by-trial basis, with the total number of trials varying each visit (average 13.3, range, 7–27). Trial duration varied based on the training stage (described in further detail in procedure).

Data were collected on all dependent variables by both the primary clinician and a second trained observer in real time via pencil and paper data. The definition of *problem behavior* was individualized to each participant; however, all participants engaged in either tantrums, aggression, or both as a primary target behavior. Tantrums were broadly defined as being some combination of screaming, crying, property destruction, or throwing items; Aggression was broadly defined as being any instance of hitting, kicking, biting, or shoving other people. Verbal aggression (i.e., profanity, verbal threats, etc.) were also included in the broad definition of aggression. Broad categories of primary targets are included in Table 1. *Independent requesting* was defined as any instance of an independent specific request for access to a social positive reinforcer (i.e., preferred toys, activities, or attention). The topography of each independent request was individualized for each child and based on their current language level. *Appropriate waiting* was defined as the number of seconds that the participant waited without problem behavior or attempting to approach preferred items. The wait duration started when the participant independently requested access to the designated reinforcer and ended with the participant either met the predetermined wait criterion in a given trial or engaged in problem behavior.

Treatment integrity data were not explicitly collected due to limitations with data collection inherent in a large volume outpatient clinic. To address this potential limitation, clinicians used a directive feedback style involving delivery of corrective feedback to caregivers immediately following a procedural error. Caregivers were coached to correct their error in the moment by delivering the corrected procedure (e.g., stopping a timer, delivering praise, etc.). These procedures ensured relatively few opportunities for procedural errors, and anecdotally appeared to reduce the probability of similar errors in the future.

### ***Interobserver Agreement***

Interobserver agreement (IOA) was evaluated by having a second independent observer collect data on all child responses simultaneously. In the functional analysis, each session's data were divided into 30-second intervals and compared on an interval-by-interval basis. Agreement percentages were calculated by dividing the number of exact agreements by the total number of intervals. IOA was calculated for 100% of all FA sessions, and averaged 91.2% (range, 80%–100%). For treatment evaluations, observers' data were compared on a trial-by-trial basis, and agreement percentages were calculated by dividing the number of sessions with agreement over the total number of sessions. If both observers scored a zero, the trial was scored as an



agreement. Quotients were then averaged and converted into a percentage. IOA was calculated for 77% of all treatment trials (range across participants, 50%–100%). Across participants, mean IOA was 91.9% for problem behavior (range, 85.4%–100%), 97.1% for wait duration (range, 90.5%–100%), and 94.7% for independent requesting (range, 85.4%–100%).

**Procedure.** In addition to attaining consent from all participating caregivers, the study's procedures were considered exempt by an institutional review board. The study was conducted as a prospective controlled consecutive case series to determine the feasibility, acceptability, and initial outcome of a compressed, protocol-driven parent management training program. All participants were enrolled in the Behavioral Intensive Treatment Program (BITP), which was conducted from 8:30 until 10:30 am on weekdays for a period of 2 weeks. Each intervention was conducted by two co-therapists, at least one of whom was a licensed psychologist, along with the identified patient and their relevant caregiver(s) for 10 separate sessions. In cases where a clinical psychology graduate student was involved in conducting the intervention, supervision occurred daily with a supervising psychologist. All participants received the same assessment and intervention procedures during the 2-week treatment; both in-session and between-session data were reviewed with caregivers intermittently to help them understand the impact of the intervention. Follow-up appointments were offered at 1, 3, and 6 months after the completion of treatment, where participating caregivers were asked to implement treatment procedures and report on rates of challenging behavior.

Caregivers were taught to implement all assessment and treatment procedures using an in-vivo behavioral skills training approach (Lafaskis & Sturmey, 2007). That is, clinicians provided instruction, modeled the use of each procedure, integrated caregivers as interventionists, and then provided feedback. Once they had demonstrated mastery over treatment procedures, caregivers were then instructed to complete practice trials after each appointment to facilitate generalization of stimulus control. The specific procedures prescribed for home practice were based on components of the intervention that were successfully demonstrated during the day's appointment. For instance, if an appointment was completed with caregivers having demonstrated successful use of effective instruction delivery and prompting procedures during the functional communication phase, the therapist instructed the family to continue practicing those skills at home. Practice types included both (1) discrete trial practices, similar to those conducted during the appointment and (2) natural environment practice, which involved using naturally occurring opportunities to practice skills learned in session (i.e., identifying participants' appropriate requests at home or in the community and following

intervention procedures to require appropriate waiting). Family members were instructed in how to complete both types of practice using role play during their time in session.

### *Intervention Description*

*Functional interview.* Prior to the start of treatment, all participants and their caregivers participated in a semi-structured functional interview designed to inform subsequent functional analyses. Specific components of the interview included (1) identifying and defining target behavior and (2) discussion of antecedent and consequent events that reliably precede and follow challenging behaviors. Specific questions were designed to both solicit relevant clinical information as well as to orient caregivers to the functional perspective of treatment (Edelstein et al., in press).

*Functional analysis.* The hypothesized functions of participants' challenging behavior was generated from the functional interview. Clinicians coached caregivers to implement a functional analysis, which assessed the environmental variables thought to evoke and maintain participants' challenging behavior. Analyses involved alternating between test and control conditions in procedures similar to those described by Hanley et al. (2014). During test conditions, putative reinforcers were removed every 30 seconds and only returned contingent on problem behavior. In many cases, various topographies of problem behavior (i.e., aggression, disruption, etc.) thought to serve in the same response class were aggregated in the test conditions following the results of the functional interview. The occurrence of challenging behavior in the test condition suggests that clinicians have identified a relevant contingency thought to evoke and maintain problem behavior. The materials available during test conditions included items/activities reported by caregivers that evoke challenging behavior (i.e., access to electronics, toys, or attention for social positive reinforcement and delivery of academic demands to increase value of social negative reinforcement). During each control condition, the putative reinforcers were available throughout the session. Caregivers were instructed to avoid presenting demands and/or restricting participants' access to tangibles and attention during the control conditions. The purpose of the control condition was to create an enriched environment as a comparison to test conditions: the absence of problem behavior in the control condition suggests that sufficient reinforcers were present in the environment to minimize the likelihood of challenging behavior. Data obtained from the test conditions of each participant's functional analysis served as the baseline for subsequent treatment evaluations.

*Treatment evaluation.* Treatment for all participants included three phases: (1) identifying and reinforcing an appropriate communication response as a functional replacement for challenging behavior (i.e., functional communication training; FCT), (2) introducing a wait program wherein participants were required to demonstrate appropriate behavior (i.e., “calm hands,” “quiet mouth,” and “calm body”) for increasing periods of time in order to access the things identified reinforcers, and (3) a denial program, which required participants to tolerate denied access to preferred items/activities. During treatment phases, caregivers learned to set limits on their child’s expectations and to reinforce only adaptive behavior consistent with the identified function of their child’s challenging behavior. In addition, they were taught to use effective commands (i.e., clear concise language, minimal prompting, and consistent follow-through) as well as extinction procedures. During periods where participants had earned access to positive reinforcement, caregivers were encouraged to play and attend to their children using behavior specific praise. These target skills were taught via behavioral skills training (i.e., instruction, modeling, rehearsal, and feedback) by each family’s therapist.

During wait training, caregivers used a digital timer and visual stimuli (e.g., “clinic rules”) to help them communicate expectations for waiting with their children. If the participant engaged in challenging behavior at any point during wait practice, the timer was paused and caregivers were coached to remain quiet until the rules for appropriate waiting were followed. Wait times began at 5 seconds for each participant and increased systematically as children and caregivers demonstrated mastery over the components of the procedure. Terminal wait criteria here determined in collaboration with caregivers and ranged from 2 to 3 minutes in length. Importantly, participants were required to engage in appropriate waiting behavior without access to distractors in order to increase their tolerance for restricted access (Edelstein et al., 2021). Participants were required to demonstrate appropriate waiting behavior in the absence of problem behavior for at least two consecutive trials prior to moving to the next phase of treatment. Exceptions to this criterion were made in cases where caregiver availability impacted treatment decisions (e.g., multiple caregivers alternating throughout the treatment process).

After children were able to demonstrate appropriate requesting and waiting behavior at the predetermined terminal wait criterion, therapists taught caregivers to introduce denied access on a variable schedule. During denial training, participants were required to demonstrate appropriate behavior following an instance where a request was denied. Following the denial statement from their caregiver (i.e., “no, that’s not available”) participants were required to demonstrate appropriate behavior in order to earn access to alternate, lesser preferred activities. Denial trials were un signaled to participants

in order to ensure that practice sessions had external validity. Once an item or activity was denied, it remained in the treatment room but unavailable for the duration of the appointment.

## Data Analysis

A single case experimental design (SCED) was employed with each participant, wherein the independent variable was controlled and changes to phases occurred as appropriate based on stability of responding. Specifically, treatment was evaluated in the clinic setting using a changing criterion design with embedded reversal over participants' waiting behavior, which was the identified skill building procedure meant to reduce challenging behavior. Functional control was demonstrated by showing that levels of appropriate waiting (i.e., in absence of challenging behavior) increased following successive changes in reinforcement contingences. Performance criteria were established a priori, prior to each successive stepwise intervention phase. In order to evaluate the effects of the intervention at the group level, paired sample *t*-tests were conducted in Microsoft® Excel® 2016 to compare pre and post treatment dependent variables. Cohen's *d* effect size estimates were also provided for all treatment analyses. All data and materials can be made available by the first author upon request.

## Results

### Group Analysis

Paired sample *t*-tests were computed to evaluate the impact of the brief intensive treatment program on dependent variables. In addition, Cohen's *d* (Cohen, 1988) effect sizes were calculated to determine the sizes of any effects. As indicated in Table 2, results of the paired samples *t*-test revealed significant decreases in problem behavior observed in-session and between sessions. Decreases in the BRS were also statistically significant. All pre-treatment to post-treatment reductions had large effect sizes, ranging from 1.37 (reduction in problem behavior per day) to 3.2 (in-session behavior reduction).

With regard to standardized measures (e.g., ECBI, BASC-3, and PSI) provided at baseline and discharge, results revealed significant changes in pre to post-treatment caregiver responses (see Table 2). Specifically, the ECBI problem and intensity subscale scores were significantly reduced after treatment with large effect sizes (1.16 and 1.64, respectively). One caregiver did not complete post-treatment standardized measures (Mildred). Results from

**Table 2.** Results of Paired Samples *t*-Test Analyses.

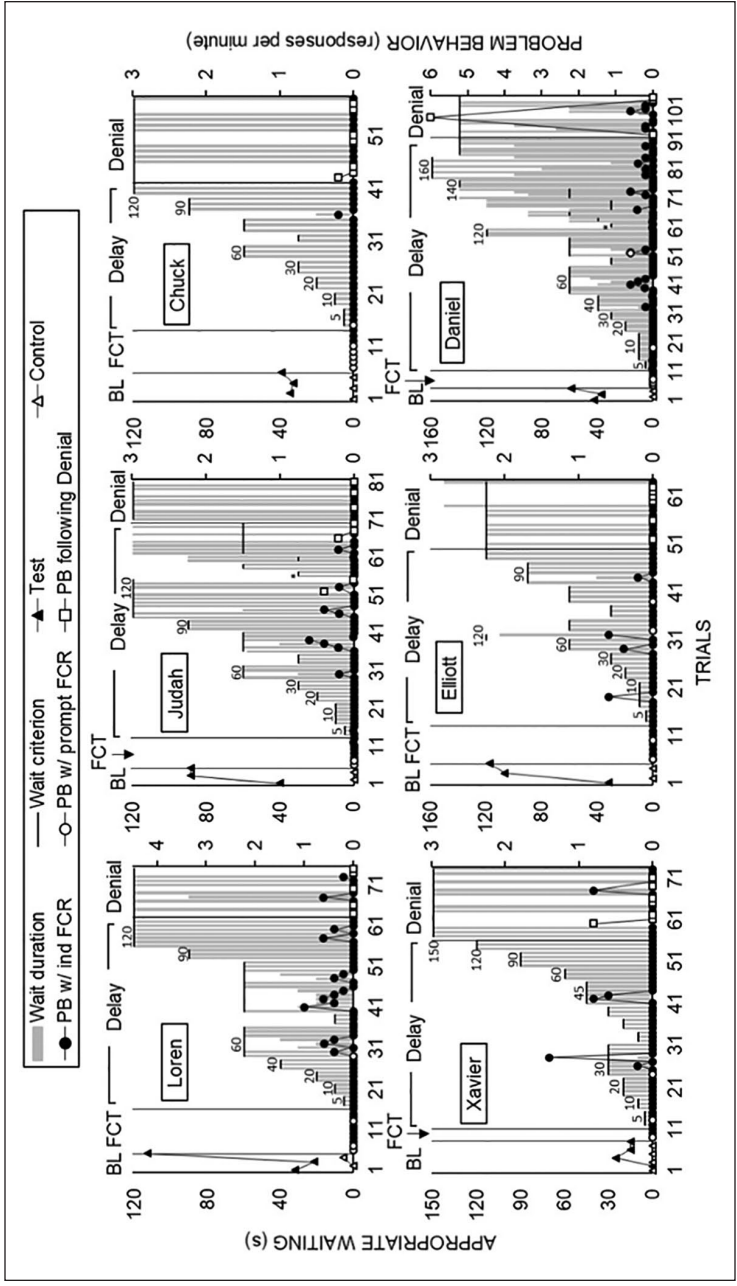
	Pre <i>M</i> ( <i>SD</i> )	Post <i>M</i> ( <i>SD</i> )	Paired samples <i>t</i> -test	<i>d</i>
In-session problem behavior	1.55 (0.48)	0.56 (0.11)	$t(11) = 11.10^{***}$	3.20
Problem behavior per day	2.42 (5.3)	0.39 (0.62)	$t(11) = 4.75^{***}$	1.37
Behavior rating scale (BRS)	7.70 (1.3)	1.60 (1.58)	$t(11) = 9.43^{***}$	2.72
ECBI—Problem	70.70 (8.6)	57.90 (7.3)	$t(10) = 3.85^{**}$	1.16
ECBI—Intensity	67.70 (4.15)	59 (6.5)	$t(10) = 5.45^{***}$	1.64
BASC—Externalizing	70.90 (8.7)	60.50 (8.21)	$t(10) = 4.12^{***}$	1.24
BASC—Internalizing	57 (11.4)	46.80 (8.8)	$t(10) = 4.27^{***}$	1.29
BASC—Behavioral symptoms	70.20 (10.6)	56.50 (6.3)	$t(10) = 3.48^{***}$	1.05
BASC—Adaptive skills	40.20 (8.5)	46.80 (3.8)	$t(10) = -2.91^{**}$	-0.88
PSI—Total stress	60.90 (6.7)	51.60 (6.5)	$t(10) = 6.38^{***}$	1.92
PSI—Parental distress	52.70 (13.8)	43.80 (13.3)	$t(10) = 2.82^{***}$	0.85
PSI—Dysfunctional interaction	56.30 (9.8)	50.80 (6.8)	$t(10) = 2.15$	0.65
PSI difficult child	67.20 (4.3)	57.60 (6.4)	$t(10) = 5.44^{***}$	1.64

Note.  $**p < .01$ .  $***p < .001$ .

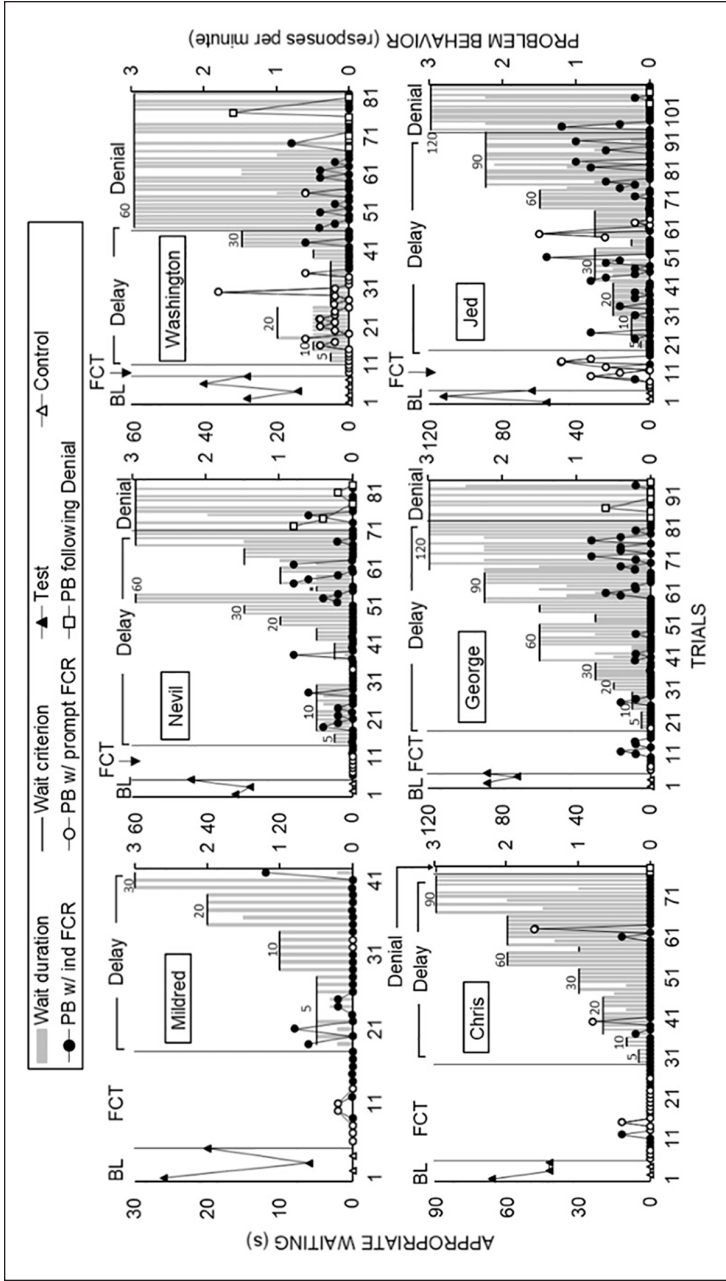
the BASC-3 indicate that the largest impact of the intervention occurred on the internalizing problems subscale (Cohen’s  $d=1.29$ ). BASC-3 adaptive skills, externalizing problems, and the behavioral symptoms index also showed large effects ( $d=-0.88$ , 1.24, and 1.05, respectively). Results from the parent stress indices (PSI) suggest that the wait training intervention was effective in reducing perceived caregiver stress, with large effect sizes evident in Total Stress, Parental Distress, and Difficult Child subscales ( $d=1.92$ , 0.85, and 1.64, respectively). However, the Parent-Child Dysfunctional Interaction subscale did not show statistically significant differences between pre and post-intervention administrations of the PSI (Table 2).

### Single Case Series Analysis

Effects of the intervention across individuals and different subphases was possible due to the single case design of the study (see Figures 1 and 2). Data from the functional analyses, all of which were ultimately used as baseline for treatment, revealed that all participants emitted some problem behavior



**Figure 1.** Results of participants' response to wait training intervention. Note. Single-case experimental design results for Loren, Judah, Chuck, Xavier, Elliott, and Daniel.



**Figure 2.** Results of participants' response to wait training intervention (continued).  
 Note. Single-case experimental design results for Mildred, Nevil, Washington, Chris, George, and Jed.

( $M=1.56$  responses per minute; range, 0.37–2.1) as access to positive reinforcement was withheld. The primary dependent variable, duration of appropriate wait behavior per trial, is graphed on the primary  $y$ -axis and appears as grey bars. Rate of problem behavior is displayed on the secondary  $y$ -axis and is reflected as line graphs. During baseline and the first phase of treatment (FCT), appropriate waiting duration remained at zero across participants, suggesting that they were not able to independently engage in these behaviors absent skills training. FCT resulted in immediate elimination (i.e.,  $\leq 3$  trials) of problem behavior for 58% of the total sample. The rest of the participants required additional functional communication training trials ( $M=16.3$ , range, 13–24 trials; Chris, George, Mildred, and Jed) to bring their rates of problem behavior to zero.

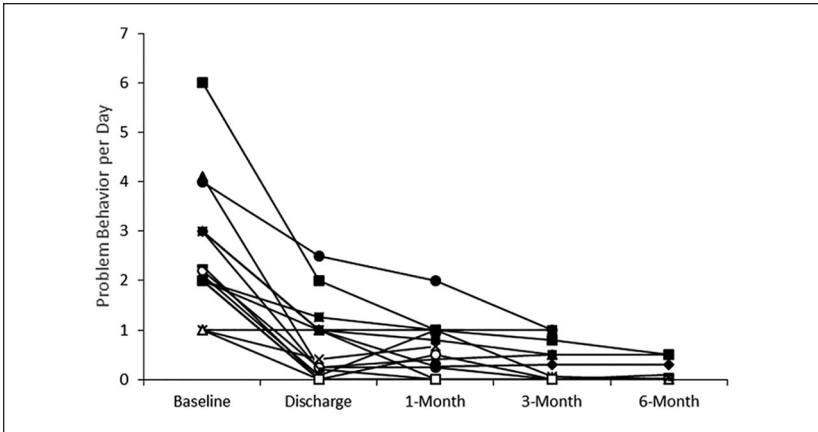
In delay training, participants' appropriate waiting behavior matched the established waiting criterion for all participants throughout all subphases. Variability in responding occurred at the terminal wait criterion for 5 out of 12 participants, and was most common among participants who had multiple caregivers alternating throughout the treatment process (Daniel, Jed, and George). Instances where caregivers alternated in their role in acting as the primary therapist (i.e., consecutive participation) are noted in the graphs using an asterisk. During denial training, rates of problem behavior initially increased for 4 out of 11 participants (Washington, Nevil, Daniel, and Chuck). However, rates of problem behavior reduced to zero or near-zero rates for all participants by the end of their admission. Overall, participants had average problem behavior reduction of 97% (range, 86%–100%).

Finally, upon discharge from the program, caregivers were asked to continue providing data about frequencies of target behavior via the Text Message Rating System on a daily basis. The authors analyzed data submitted for 11 out of 12 participants who agreed to participate at 1-, 3-, and 6-month post-discharges to monitor progress and assess for maintenance of skills. Rates of problem behavior at discharge averaged 0.79 instances per day ( $n=11$ ;  $SD=0.85$ ); data collected from caregivers at 1-month post-services averaged 0.66 instances per day ( $n=10$ ;  $SD=0.61$ ). Continued monitoring of families at 6-month post-discharge (see Figure 3) suggests that treatment effects may be durable over time.

### *Attrition and Satisfaction*

Only one family dropped out of treatment (8.33% of participants) prior to receiving the full intervention ("Mariah;"  $n=2$  treatment days). However, the caregiver reported that she was pleased with her child's progress at the point of termination (i.e., functional communication training and wait training);





**Figure 3.** Results of follow-up progress monitoring.

Note. Problem behavior per day refers to instances of challenging behavior reported by caregivers via the text message delivery system. Each data point shows the mean rate across 5 days during baseline, immediately following discharge, and at 1-, 3-, and 6-month follow-ups.

treatment ended with an 86% reduction of in-session target behavior, 100% reduction of at-home problem behavior, and a 50% reduction in the BRS. Mariah’s mother agreed to continue reporting rates of problem behavior at home, and at the 1-month checkpoint behavior rates were 0.4 problem behaviors per day, averaged across 5 days (down from 4 per day in baseline).

Regarding caregiver responses on the acceptability measure, mean responses to items across caregivers ( $n=12$ ) was 4.4 out of 5 total points (range, 3.8–4.9), where 5 reflects a maximum score of satisfaction (see Table 3). The question that averaged the lowest score ( $M=3.8$ ) asked about satisfaction around program length, with several caregivers reporting that they would have liked the program to last longer than 2 weeks. The two questions that averaged the highest scores ( $M_s=4.9$ ) asked about level of support provided by the therapist and the overall impressions of the intensive program.

## Discussion

The results of the current study suggest that a compressed 10-day behavioral parent training program based on the principles of applied behavior analysis is a feasible treatment package for young children with behavior problems. With the exception of one patient, participants and their caregivers remained engaged for the duration of the intensive 20 hours program. Treatment

**Table 3.** Results of Caregiver Satisfaction Measure.

Question	Mean score (range)
1. The length of the treatment program met my expectations and the needs of my family	3.8 (3–5)
2. I was surprised about the progress my child made over the course of the program	4.4 (3–5)
3. I feel more confident that I can prevent challenging behavior from happening in the future	4.2 (4–5)
4. I feel more confident that I can manage my child's challenging behavior in the future	4.1 (2–5)
5. I felt that I was able to learn the skills necessary to help my child to be successful	4.3 (4–5)
6. I felt supported by my child's therapist	4.9 (4–5)
7. Overall I felt it was helpful to have my child participate in the intensive treatment program	4.9 (4–5)

Note. Caregivers were asked to rate on a Likert scale, with 1 = strongly disagree, 3 = neither agree or disagree, and 5 = strongly agree.

included both function-based skill acquisition (i.e., functional communication training) and behavior reduction (i.e., differential reinforcement with extinction) programming. The improvements seen at posttreatment coupled with maintenance of gains at follow-up indicate that a 10-day intensive program can effectively improve externalizing behavior problems in young children. Caregivers who completed the program also reported high acceptability of the treatment package, ( $M=4.37$  out of a possible 5.0 across items on the acceptability survey).

Participants' challenging behavior was significantly reduced following the implementation of the wait training procedure, as measured both by observation from trained observers and parent report. Wait training was signaled both from the caregiver (i.e., "first you have to wait") and from a digital timer. The use of the digital timer may have been an essential component in the maintenance of stimulus control across trials and appointments. Specifically, most participants focused intently on the timer as it counted down, which may have aided in the tolerance of increased delays. These responses suggest a type of habituation similar to those described during exposure treatments (e.g., Grayson et al., 1982), wherein participants are required to focus their attention on an aversive stimulus in lieu of distracting themselves with alternate items. While the durations of the wait intervals were relatively brief across participants (range, 60–150 seconds), it may be that this type of brief "wait with nothing" paradigm is sufficient to establish stimulus control over

signaled delays to reinforcement. Following implementation of wait training procedures, participants demonstrated a 97% reduction of problem behavior in session. Reductions of this magnitude are consistent with the behavior analytic literature demonstrating the efficacy of function-based interventions (e.g., Ghaemmaghami et al., 2016). These effects were not limited to those that occurred within appointments; as part of ongoing progress monitoring, caregivers were asked to report on generalization of treatment gains at participants' homes and in the community. Specifically, the use of daily text message data collection system allowed caregivers to report on the impact of behavioral strategies between sessions. Caregivers reported an 89% reduction of problem behavior occurring between appointments ( $M$  (baseline)=2.6 instances per day;  $M$  (discharge)=0.388 instances per day). These results, along with follow-up data reported in the previous section, are promising indicators about the clinical utility of the procedures (Ghaemmaghami et al., 2021).

Yet another significant finding of the current study was the magnitude of reported change by caregivers themselves via standardized measures. With regard to the ECBI, caregivers rated the amount and intensity of participants' challenging behavior to be clinically significant on the ECBI ( $M$ s=70.7 and 67.7, respectively). Similarly, caregiver ratings on the BASC-3 yielded clinically significant scores in both externalizing problem and behavioral symptoms index ( $M$ s=71 and 70, respectively). These parent reports suggest that participants included in the study exhibited maladaptive behaviors that significantly impacted their functioning. These impressions were consistent with observations of in-session problem behavior, which often included aggression, property destruction, threats of violence, and profanity. Subsequent caregiver ratings on standardized measures at discharge suggest that participants' challenging behavior no longer met clinical criteria across domains. Interestingly, the cluster of items on the BASC-3 with the largest effect size following pre/post data analysis was the Internalizing Problems subscale. This was an encouraging finding, as behavior analytic interventions are often primarily considered within the context of externalizing behavior issues. However, as diagnostic criteria for childhood mood symptoms typically include observable behaviors such as crying, whining, negative vocalizations, and irritability (American Psychiatric Association, 2013), it is possible that the creation of predictable access to positive reinforcement inherent in the intervention procedure had collateral positive impact on caregivers' impressions of their child's mood.

Although the current study was a preliminary investigation of the feasibility and acceptability of a novel behavioral parent training protocol, the

results have implications for future clinical practice. Specifically, while broadly accessible, behavioral parent training programs have been criticized for low caregiver engagement and program attrition (Chacko et al., 2016). Conversely, while highly effective, behavior analytic interventions have been criticized as lacking generalizability or as being too rigid (Boutot & Hume, 2012). Our approach highlights procedures that combine effective components across disciplines of clinical psychology (i.e., the accessibility of a caregiver-based approach combined with the technical precision of behavior analytic interventions). The product of this synthesis is a concurrent caregiver and child-based skill acquisition program, where children learn to habituate to aversive stimuli (i.e., restricted access to preferred items/activities) and caregivers learn to support their children without accommodation. During the compressed treatment program, a deliberate emphasis was placed on between-appointment practice to facilitate generalization; specifically, clinicians encouraged both discrete, trial-based skills practice as well as natural environment training. Clinicians engaged in daily review of home-based and community-based data to model the use of ongoing data-based decision-making.

The conclusions of the current study should be tempered by its limitations. While the use of a well-controlled single case design is useful when assessing the practicality of an intervention (Morgan & Morgan, 2001), future research should evaluate the effectiveness of the current intervention using random assignment to an alternative evidence-based behavioral treatment. In addition, while the small sample size of the current study represents another potential limitation, the findings were statistically significant and with large effect sizes. Additionally, although there may be a potential selection bias among families who agreed to participate in an intensive treatment program, the authors undertook considerable efforts to identify families across diverse socioeconomic backgrounds, family constellations, and previous history of behavioral intervention. That last point is of particular note, as 50% of participants had received behavioral services for a year or greater without success prior to their referral to the intensive program. While there were no significant differences in outcome among these two “cohorts,” the inclusion of participants with a history of treatment-resistant behavior problems is likely another strength of the current investigation. Future studies should consider examining behavioral and demographic predictors for success in an intensive intervention program.

Another important limitation of the current study is the absence of caregiver treatment integrity data. As the procedures of the study were mainly implemented by caregivers, direct measures on skill acquisition would have provided important information about the efficacy of the training procedures.

Further, the authors attempted to correct for the absence of these data by using directive, in vivo caregiver coaching as a means of reducing issues with treatment fidelity. While the primary goal of the current study was to evaluate the feasibility and acceptability of a compressed treatment format, future research should evaluate the teaching procedures specifically; effective and efficient caregiver training is a critical component of any behavior parent training program.

Overall, the current study sought to incorporate the relative strengths of previously established behavior analytic assessment and treatment procedures into a behavioral parent training paradigm. The intervention package was administered over the course of a 2-week intensive admission, consisting of daily 2-hour sessions. While 92% of families completed the full 2-week program, all participants demonstrated clinically and statistically significant reductions in problem behavior. In addition, distal measures of rates of problem behavior suggest that treatment effects may be durable over time. While subsequent validation of the study's procedures is necessary through randomized controlled trials, the current investigation offers preliminary evidence for a high dosage parent-based behavior analytic intervention to address challenging behavior in young children.

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### **Data Availability Statement**

All data and materials can be made available by the first author upon request.

### **Data Transparency Statement**

No parts of the current dataset have previously been published or are currently in press.

### **Declaration of Conflicting Interests**

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