



Adjunctive Parental Support Within Manualized Parent Training for Children with Autism Spectrum Disorder

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Abstract

Parent training is a central focus of behavioral intervention, with emphasis on teaching parents to become change agents for their children by using behavioral management skills. However, its effectiveness is limited by a parent's ability to engage in the learning process. Parents managing external stressors, psychopathology, or poverty often do not gain the skills and thus, the treatment may minimally impact parent and child behavior. In order to increase a parent's ability to acquire and implement new skills accurately, referred to as parent treatment integrity, the current study added a parent-support component to the RUBI Autism Network's Parent Training for Disruptive Behaviors protocol. The parent-support component was intended to remove barriers to skill acquisition during the parent training session by alleviating some of the interfering parental stress. In an alternating treatments design, a community-based sample of five parent-child dyads (average age of child = 32 months) participated in the parent-training protocol; half of the intervention sessions included a 15-min parent-support component. The addition of the parent-support component increased parent engagement, treatment integrity, and learned parenting skills, like parent praise. Results support a model of change for parenting behavior. Inclusion of a parent-support component is supported as an effective practice for parent training.

Keywords Treatment integrity · Parental stress · Parent support · Parent training · Disruptive behaviors · Autism

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Though child outcomes are typically the focus of child intervention, child behavior is linked to parent behavior undeniably. This interdependence is a central tenet of parent-training programs. Despite parents' best efforts, research shows that ineffective parenting strategies lead to undesired child behaviors, and positive parenting practices improve child functioning [1]. Consequently, if change in child behavior is desired, change in parent behavior is the place

for intervention. Research has focused on developing parent-training protocols to facilitate parent skill acquisition. While a skills-deficit is a part of the difficulty of parenting a child with challenging behavior, additional factors impact a parent's ability to learn and implement new skills. A high rate of attrition from parent-training programs, estimated to be between 28 and 60%, speaks to the difficulty of engaging in these programs [2, 3]. Current parent training literature largely ignores parent variables that may influence treatment engagement and success. The next frontier of parent-training research must be the development of methods to increase parent effectiveness in implementing learned skills.

While retention and attendance are essential for parent treatment engagement, any clinician can attest that simply attending treatment sessions does not result in skill acquisition or behavior change for the parent or the child. In general, parent-training programs have failed to measure parent engagement objectively, apart from outcome data. As the primary agent of change in a parent-training program, the parent's ability to implement the intervention as intended influences its success and its impact on the child. The degree to which an intervention is implemented as designed is

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referred to as “parent treatment integrity,” also known as treatment fidelity [4]. Parent treatment integrity is essential to the validity of an intervention and the reliability of treatment outcomes [5], and it has been found to predict parent behavior change [6]. Following active treatment, when behavioral interventions are implemented in naturalistic settings (e.g., home) by individuals with little behavioral analytic training (e.g., parents), it becomes even more likely that the integrity of the treatment may be compromised [7]. In order to problem-solve implementation barriers, Fallon and colleagues [8] provided additional support to parents in a parent-training program for children with autism spectrum disorder (ASD) and disruptive behaviors. Parents who received this additional support demonstrated increased parent treatment integrity and further decreased child disruptive behaviors [8]. It is imperative that parent training studies monitor and support a parent’s ability to implement learned skills accurately and effectively.

In order to support parent treatment integrity, factors that impact it must be identified. The impact of a parent’s private events on behavioral treatment has been largely overlooked in the literature. A “private event” refers to a stimulus or a response that is not observable (e.g., a thought, a physical sensation, an emotion) and can impact behavior [9]. Recent research has attempted to identify parent demographics and characteristics that predict attrition or failure to begin treatment [10]. The rate of attrition from parent training is highest for participants that experience low family income, low parental education/occupational status, and maternal psychopathology [11]. From a broad perspective, each of these factors undoubtedly increases parental stress. Outside the parent-training literature, stress has been identified consistently as a barrier to treatment adherence [12]. Excessive levels of stress negatively impact multiple processes in the brain, including behavioral flexibility, neural plasticity, and memory storage [13, 14], all essential for learning and behavior change. Therefore, high levels of parental stress, if unaddressed, would be expected to hinder learning and implementation of new behaviors and parenting strategies, and as a result, parent treatment integrity is likely to be low. Thus, it is paramount to alleviate parental stress in order to engage parents effectively in parent training.

Child disruptive behaviors, characterized by defiance, disobedience, and aggression towards others, predicted parental stress in multiple age groups [15] and accounted for the majority of the variance in a model of parental stress [16]. Parents often feel uncertain of how to manage disruptive behaviors [16, 17] and incompetent in attempts to do so [18]. While parental stress may occur in any parent-child relationship, it is especially relevant for families with a child with ASD, as parents of a child with ASD experience elevated levels of parental stress [15]. It has been estimated that 30% of children with ASD engage in disruptive

behaviors, compared to 5–14% of typically developing (TD) children and children with other developmental disabilities [19]. Thus, parents of children with ASD would benefit from behavioral skills training to manage child disruptive behaviors, as well as from support for the associated parental stress. Kazdin and Whitley targeted parental stress within a parent-training program by including five 50-min parent-only sessions over the course of the parent-training program [20]. The participating group of parents indicated a greater reduction of parental stress and experienced greater child behavior change (i.e., fewer child disruptive behaviors) than those who did not participate in parent-only sessions [20]. Facilitating parent skill acquisition alone does not guarantee parent or child behavior change given the significant impact of parent variables on parent treatment integrity.

Longstanding research has indicated that the ratio of positive to negative interactions impacts interpersonal relationships [21]. Thus, increasing the number of positive interactions is an important goal within a parent-child relationship fraught with negative interactions due to disruptive behaviors and elevated levels of parental stress. Increasing positive praise statements from parents could have cascading effects on parent behavior, child behavior, and the overall parent-child relationship. The quality of the parent-child relationship has been predictive of a child’s behavioral functioning for both TD children and children with intellectual disability, where higher warmth is associated with fewer behavior problems [22, 23]. Among adolescents and adults with ASD, high levels of maternal criticism or emotional over-involvement, also referred to as expressed emotion, was associated with increased disruptive behaviors and increased ASD symptoms [24]. In contrast, a positive parent-child relationship, characterized by high levels of maternal warmth and fewer disruptive behaviors, resulted in a reduction of core symptoms of ASD, specifically, repetitive behaviors [25]. An increase in positive parent-child interactions could improve the parent-child relationship, and in turn, child disruptive behavior. The implications of improved parent praise render it an essential target of parent-training programs, especially within this population.

Furthermore, parental stress impacts the parent-child relationship, which has a cascading impact on parent and child behavior. Parents with high levels of parental stress experience more irritability, often give instructions as commands, and respond to disruptive behavior with higher levels of attention [26]. Unfortunately, high-attention responses result in the child *increasing* the relevant behavior, not decreasing it [27]. These parenting behaviors often inadvertently reinforce the disruptive behavior [26]. Therefore, the relationship between parental stress and disruptive behavior is bidirectional, each increasing the likelihood of the other [28]. Behavioral parent training does not occur “in a vacuum,” but rather in a broader context that includes the parent-child

relationship and the impact of parent private events and parental stress.

Purpose

Parent-training protocols are hyper-focused on teaching parents a specific skillset. Such training is important and valuable, but for it to be effective, parents must implement the learned skills accurately and consistently. We aimed to increase the effectiveness of a manualized parent-training program by adding a parent-support component. We focused on facilitating parent learning during the parent-training session. While findings comment on the effectiveness of a manualized parent-training program administered by a doctoral level investigator within a community-based sample, the primary purpose was to provide evidence for a feasible way to increase parent treatment integrity in the course of standard treatment.

Methods

Design

We implemented a single-subject alternating treatments design in which each participating family received two treatment packages (i.e., manualized parent training [PT-Alone] and manualized parent training with a parent-support component [PT-Plus]) in a rapid alternating fashion with a randomized order of conditions. Over approximately 18 weeks, five families participated in the 11 core sessions of the Research Units in Behavioral Intervention Autism Network Parent Training for Disruptive Behaviors manual (RUBI manual), following three baseline observations [29]. The parent-support component consisted of approximately 15 min of supportive therapy with parents only which was

randomized to occur before six of the core parent-training sessions.

Given that the definition of a baseline phase is that there is no treatment administered to which participants can adhere, parent treatment integrity could not be measured effectively during baseline. Thus, an alternating treatments design was implemented in order to observe and compare two variations of treatment adherence: the level of treatment adherence when parents are not provided support and the level of treatment adherence when parents are provided support.

Participants

The participants in the current study were five dyads of a parent and a child who was between 27 and 48 months of age, who had been diagnosed with ASD and who exhibited disruptive behavior (e.g., aggression, non-compliance, and tantrums, defined individually for each participant below). All five dyads included the biological mother as the parent participant. Each parent participant was able to communicate fluently in English. Demographic data are listed in Table 1.

During baseline, each child was observed to identify strategically common disruptive behaviors, precipitants, and functions of behavior, including access to preferred items or activities, gaining attention from the parent, escaping unwanted tasks, and automatically reinforcing behaviors [29].

Dyad 1

Jared was a 3 year, 9 month Hispanic male whose disruptive behavior was characterized by throwing himself on the floor, screaming, and crying. He often engaged in these behaviors when a preferred object was removed (e.g., mother’s cell

Table 1 Demographics table

Participant	Child 1	Child 2	Child 3	Child 4	Child 5
Age pre-treatment (years.months)	3.9	2.6	2.3	2.10	2.3
Age post-treatment (years.months)	4.0	2.11	2.7	3.2	2.7
Ethnicity	Hispanic	Caucasian	Hispanic	Black	Black
Gender	M	M	M	M	F
Disruptive behavior	– Screaming – Crying – Throwing himself on the floor	– Screaming – Crying – Throwing himself on the floor – Self-injury	– Screaming – Crying – Laying on the floor – Swiping Toys – Hitting others	– Screaming – Crying – Throwing himself on the floor – Hitting himself – Biting others	– Screaming – Crying – Throwing herself on the floor – Hitting others – Access
Functions of behavior	– Escape – Access	– Access – Attention	– Access	– Access	– Access

phone) or a preferred activity ended (e.g., turning off the TV).

Dyad 2

Anthony was a 2 year, 6 month Caucasian male whose disruptive behavior was characterized by throwing himself on the floor, screaming, crying, and self-injury (e.g., hitting his thigh or stomach with his fist). He engaged in these behaviors when not given a desired object. Anthony was also described as extremely persistent, given that tantrums had persisted for an hour despite parents' report of ignoring the behavior.

Dyad 3

Logan was a 2 year, 3 month Hispanic male whose disruptive behavior included swiping toys from the table, hitting others, and crying, laying on the floor, and screaming. These behaviors typically occurred when a parent initiated cooperative play "incorrectly" or a preferred object was removed.

Dyad 4

Jaden was a 2 year, 10 month African-American male whose disruptive behavior was characterized by throwing himself on the floor, screaming, crying, hitting himself, and biting others. He engaged in these behaviors 3–4 times daily, often when denied a request for a desired object and when a preferred activity ended.

Dyad 5

Brianna was a 2 year, 3 month African American female whose disruptive behavior was characterized by throwing herself on the floor, screaming, crying, and hitting others. She engaged in these behaviors when a preferred object was removed (e.g., a pen) or while waiting for a desired object (e.g., waiting for food to be ready for consumption).

All participating children received clinical diagnoses of ASD from a specialty center in a university-associated medical institution prior to referral to the study. Each child's assessment included administration of the Autism Diagnostic Observation Schedule, Second Edition (ADOS-2) [30]. Approvals from the Institutional Review Boards at both the university and the hospital were obtained prior to recruitment. Child-focused treatments related to symptoms of ASD (e.g., speech therapy, occupational therapy, feeding therapy) did not exclude a family from participation. Children older than age five were excluded from participation due to the focus and modality of treatment and to ensure patient and staff safety when managing disruptive behavior.

All information related to families was kept confidential, including each participant's name and behavioral data. To protect the participant's privacy, he or she was assigned a number and pseudonym. At no time did any paperwork contain the participant's name. The study participants were not responsible for any research-related costs and treatment was provided free of charge and without insurance involvement.

Procedure

Baseline Procedure

Each dyad participated in 14 sessions total over a range of 16–24 weeks. Each session was approximately one hour and 15 min in length. The first three sessions were baseline sessions; during the first session a structured interview was conducted in order to identify the behaviors most concerning to parents, while the child played in the room. The second and third sessions were part of the baseline observation period in order to determine which reported behaviors were best supported by observation. During the last 10 min of each session, the parents engaged in free play with the child, while the therapist observed separately and gathered functional relationship data via conditional probability observations. The free play period was coded for parent and child behaviors, specifically child disruptive behavior and parent praise.

Intervention Procedure

Following the baseline sessions, each dyad participated in the 11 core sessions of the RUBI manual, which addressed disruptive behaviors including noncompliance, difficulties with transitions, aggression, and tantrums. Each of the 11 treatment sessions included one parent-training module designed specifically for families with children with ASD (See [Materials](#), RUBI Manual). The first author served as the principal investigator and therapist for each session. During the last 10 min of each session, parents engaged in free play with their child, while the therapist observed separately and coded for target behaviors, including child disruptive behavior and parent praise. Five intervention sessions were randomly selected to be PT-Alone sessions, which consisted of one of the 11 core modules of the RUBI manual and a 10-min free play observation period. Six intervention sessions were randomly selected to be PT-Plus sessions, which, in addition to one of the 11 core modules of the RUBI manual and a 10-min free play observation period, included a pre-session parent-support component that was approximately 15 min in length and included parents only.

Parent-Support Component

The 15-min pre-session parent-only support provided in six randomly selected PT-Plus sessions is identified as the parent-support component. Prior to the parent-training module for that session, the principal investigator met with the parent individually. The parent-support component was unstructured to allow each parent to guide the focus in order to alleviate stress that might interfere with learning during that session. During this time, parents expressed behavioral concerns that had not yet been addressed in session (e.g., brushing teeth; school behavior problems), disclosed barriers to attending treatment, discussed implementation of strategies at home, described a lack of support from a partner, described stress related to other children, and indicated disagreement with learned strategies. Therapeutic interventions included repairing a therapeutic rupture through validating parental emotional experience, motivational interviewing related to barriers to progress, reflective listening, and collaborative problem-solving. The unstructured parent-support component was intended to allow individualization of treatment to remove barriers to learning and to encourage collaboration between the parent and therapist.

Data Collection Procedure

Each session was videotaped to allow for the measurement of outcome data, which are described in detail in the Measures section. Data related to parent treatment integrity, child disruptive behavior, and parent praise were collected following each session by the principal investigator and, for 40% of sessions, a trained observer to assess inter-observer agreement (IOA). Parent treatment integrity was recorded by the percentage of accurately completed parent objectives specific to each parent-training module. Child disruptive behavior and parent praise were measured via partial interval recording during the 10-min free play at the end of each session. At the end of treatment, parents rated the acceptability of the intervention as a whole via the Behavior Intervention Rating Scale [31]. The data collection procedure is described in more detail respective to each measure in the Measures section.

Materials

RUBI Manual

The primary treatment modality was a behavioral parent-training program, the Parent Training for Disruptive Behaviors manual, developed by the RUBI Autism Network (RUBI manual) [29]. The RUBI manual is a parent-training program based on the principles of applied behavior analysis (ABA) and was developed for families with children with

ASD and comorbid disruptive behaviors [32, 33]. Initial pilot studies measured the efficacy of the manual in comparison to psychopharmacological intervention [32, 34–36] and acceptability to parents [37].

The current study consisted of the 11 core modules. Modules 1 and 2 teach behavioral principles to facilitate parents' understanding of behavioral theory underlying learned strategies. Modules 3–8 focus on strategies to prevent disruptive behavior (e.g., visual schedules, positive reinforcement, planned ignoring, functional communication training, compliance training). Modules 9–11 focus on teaching new skills and on the generalization of skills. Each module is guided by a therapist script and parent activity sheets, which monitor understanding. Modules include didactic instruction, instructor modeling, role-playing, and video vignettes to promote active skill acquisition. All participants progressed through the modules on a weekly basis, such that during each new session, a new module was presented in the order of the RUBI Manual.

Measures

Parent Treatment Integrity—RUBI Manual Treatment Fidelity Checklist, Parent

As the primary outcome measure, parent treatment integrity was coded based on parent participation during each parent-training session. A RUBI manual treatment fidelity checklist (RUBI Manual TFC) operationalized goals specific to each parent-training module [29]. Following the session, the therapist rated the parent's treatment integrity to module-specific skills on a scale from "0" to "2." A score of "0" indicated the strategy was not implemented at all, a score of "1" indicated the strategy was implemented but not fully or accurately, and a score of "2" indicated the most accurate implementation. The "N/A" or "not applicable" option was selected if the therapist failed to administer the relevant item and thus did not allow the parent the opportunity to demonstrate that behavior (i.e., the therapist did not show the video vignette due to lack of time). The percentage of parent treatment fidelity for each session was calculated by adding the points received on the scale, dividing that number by the total points possible, then multiplying by 100 to obtain a percentage (i.e., See Fig. 1). As indicated above, parent treatment fidelity was measured only during treatment sessions due to the nature of the variable.

To ensure reliability, IOA for the RUBI Manual TFC was collected for a minimum of 40% of all intervention sessions. Specific training procedures, coding procedures, and IOA collected for parent treatment fidelity data are reported below within the section dedicated to IOA.

Fig. 1 RUBI Manual Treatment Fidelity Checklist, Module 6 Planned Ignoring, parent (Bearss et al., [29])

PARENT OBJECTIVES	RATING			
	0	1	<u>2</u>	N/A
1. PARENT IDENTIFIED CONSEQUENCES IN THE VIDEOS THAT REINFORCE DISRUPTIVE BEHAVIOR.	0	1	<u>2</u>	N/A
2. PARENT IDENTIFIED RULES FOR USING PLANNED IGNORING VIA USE OF VIDEO VIGNETTES.	0	1	<u>2</u>	N/A
3. PARENT IDENTIFIED WHEN TO USE THE 3 TYPES OF PLANNED IGNORING VIA VIDEO AND WRITTEN VIGNETTES.	0	1	<u>2</u>	N/A
4. PARENT ASSISTED IN DESIGNING A PLANNED IGNORING PROGRAM FOR HOME.	0	1	<u>2</u>	N/A
5. PARENT DEMONSTRATED THE ABILITY TO USE PLANNED IGNORING VIA ROLE PLAYING.	0	<u>1</u>	2	N/A
				TOTAL 9/10 = 90 %

Observational Data

During the 10-min free play at the end of each session, the therapist observed and recorded observational data via interval occurrence. The most effective method of measuring behavioral occurrence was determined to be partial interval recording based on the topography of the behaviors, so the interval was marked if the behavior occurred at any point during it. The intervals were 10 s in length, resulting in 60 intervals within the 10-min observation period. The percentage of intervals that included parent praise and child disruptive behavior is reported for each dyad. As a measure of IOA, a trained observer independently coded both behaviors for 40% of all sessions; IOA for each behavior for each participant is reported in the Results section.

Parent Behavior Observational Data—Parent Praise

The parent behavior of providing praise for positive behavior was observed and measured during baseline and in all subsequent sessions. Parent praise served as a specific measure of parent treatment integrity, given that it is a learned strategy in the RUBI Manual, and it also allowed an estimate of parenting behavior at baseline. Parent praise was operationalized as any instance in which a parent expressed verbal positive praise, general or specific, (i.e., “Good job!” or “I love how you are sitting quietly”), described the child’s play to reflect close attention, or made a positive vocalization either as an imitation or to indicate pleasure (i.e., clapping or saying, “Yay!”).

Child Behavior Observational Data—Disruptive Behavior

Regarding child outcomes, the principal investigator and the parent collaborated to identify a target behavior based

on direct observation and parent report during the baseline sessions. The primary target of observation was selected based on parent preference, severity, and frequency during observation. The disruptive behavior for each child is operationalized in the description of the participants (see above).

Therapist Procedural Integrity—RUBI Manual Treatment Fidelity Checklist, Therapist

Following each session, the therapist completed an additional RUBI Manual Treatment Fidelity Checklist that monitored therapist objectives specific to each parent-training module (i.e., presented the concept of planned ignoring; presented the video vignette). Therapist procedural integrity data were collected for all intervention sessions to ensure that the principal investigator implemented the treatment accurately across families and conditions. Data are reported as percentage of steps completed accurately by the principal investigator on the same “0–2” scale used for the parent treatment integrity data collection. Additionally, IOA for therapist procedural integrity was collected for a minimum of 45% of intervention sessions to protect against bias. Overall, therapist procedural integrity averaged 96.90% (range = 83.33–100.00%). Therapist procedural integrity and corresponding IOA for each dyad is provided in Table 2.

Inter-Observer Agreement

As mentioned, as a measure of internal control, for 40% of sessions a trained observer served as a second data collector for all dependent variables: parent treatment integrity, parent and child behavioral data, and therapist procedural integrity. In order to participate as a trained observer, each doctoral student completed two hours of training with the principal investigator using video vignettes from the RUBI manual

Table 2 Therapist procedural integrity average percentage by Dyad

Parent-child Dyad	Therapist procedural integrity average percentage (range)	Interobserver agreement percentage (range)
Dyad 1. Jared	96.01% (83.33–100.00%)	96.92% (84.62–100.00%)
Dyad 2. Anthony	96.79% (85.00–100.00%)	100.00%
Dyad 3. Logan	96.81% (90.91–100.00%)	97.78% (88.89–100.00%)
Dyad 4. Jaden	98.07% (91.67–100.00%)	100.00%
Dyad 5. Brianna	96.82% (86.36–100.00%)	100.00%

to practice behavioral coding. Each trained observer was required to meet 90% agreement with the principal investigator. Re-training was required any time an observer fell below 80% agreement during an observation and was required one time with each of the two trained observers. Observers were trained in the measurement of target behaviors, but they were blind to the condition of each session (i.e., PT-Plus or PT-Alone). Agreement between observers was defined as both observers indicating the target behavior occurred or did not occur during the interval. This method of determining agreement is considered more rigorous than a frequency count because it requires the same behaviors to be observed within the same interval. The percentage of IOA for each dependent variable was determined using an interval-based observation scheme by dividing the number of intervals in agreement by the total number of intervals within the observation and multiplying by 100 [38]. IOA occurred via live or video-recorded observations. IOA for each outcome variable is reported in the Results section.

Acceptability—Behavior Intervention Rating Scale

Parents completed a measure of overall intervention acceptability, the Behavior Intervention Rating Scale (BIRS) following the final parent-training session [31]. The BIRS consists of 24 items each scaled on a 5-point Likert scale, ranging from “*Strongly disagree*” to “*Strongly agree*.” The items address treatment effectiveness, as characterized by level of behavior change, maintenance and generalization of behavior change, as well as comparison of behavior to peers [31]. In the current study, the BIRS was modified to address parents and the home setting rather than an academic setting (i.e., the word “classroom” was changed to “home” in each item; “teacher” was changed to “parent”). Research indicates that these types of minor modifications to the wording of a measure have no significant effect on a measure’s validity or reliability [39]. The total BIRS score,

which is a sum of all responses on 24 items (e.g., maximum score is 120), represents the parent’s perception of acceptability of the intervention as a whole at post-treatment. We determined the benchmark for acceptability to be a score of 96 or above, indicating the parent rated the intervention as 80% acceptable overall, or rated an average of 4 on the 5-point Likert scale.

Visual Analyses

The current study employed visual analysis as the primary method of analyzing outcome data. Observational data have been graphed to allow for visual analysis between treatment conditions in terms of level, trend, and variability in level and trend, specifically looking for separation between conditions for parent treatment integrity, child disruptive behavior, and parent praise.

Supplemental Analyses

Additional measures have been included to support visual analysis and evaluate differences between data sets. A non-parametric measure of effect size, percentage of non-overlapping data (PND), was employed for condition-specific variables. The PND calculation consists of dividing the number of data points in the intervention phase that are above the highest data point in the baseline phase by the total number of intervention data points [40]. PND can be used to support visual analysis in single-subject designs by quantifying change between baseline and treatment phases [40, 41].

Results

Parent Treatment Integrity—RUBI Manual TFC, Parent

The primary aim of this study was to examine the impact of the intervention on parent treatment integrity, which was measured by rating parent objectives within each parent-training module in the RUBI Manual. Data from the RUBI Manual TFC for each dyad and corresponding IOA are displayed in Fig. 2 and Table 3. For four of five dyads, parent treatment integrity was greater following PT-Plus sessions compared to PT-Alone sessions.

Of note, the IOA for observations of Dyad 2 fell below the acceptable range. The average IOA was 92.00% (range = 60.00–100.00%). On one occasion the IOA was 60.00%. This discrepancy occurred during a video-recorded observation of the session and was due to disagreement between the principal investigator and the trained observer on the accuracy of parent implementation of module goals

Fig. 2 Parent Treatment Integrity based on the RUBI Manual Treatment Fidelity Checklist. Percentage of accomplished module-specific goals

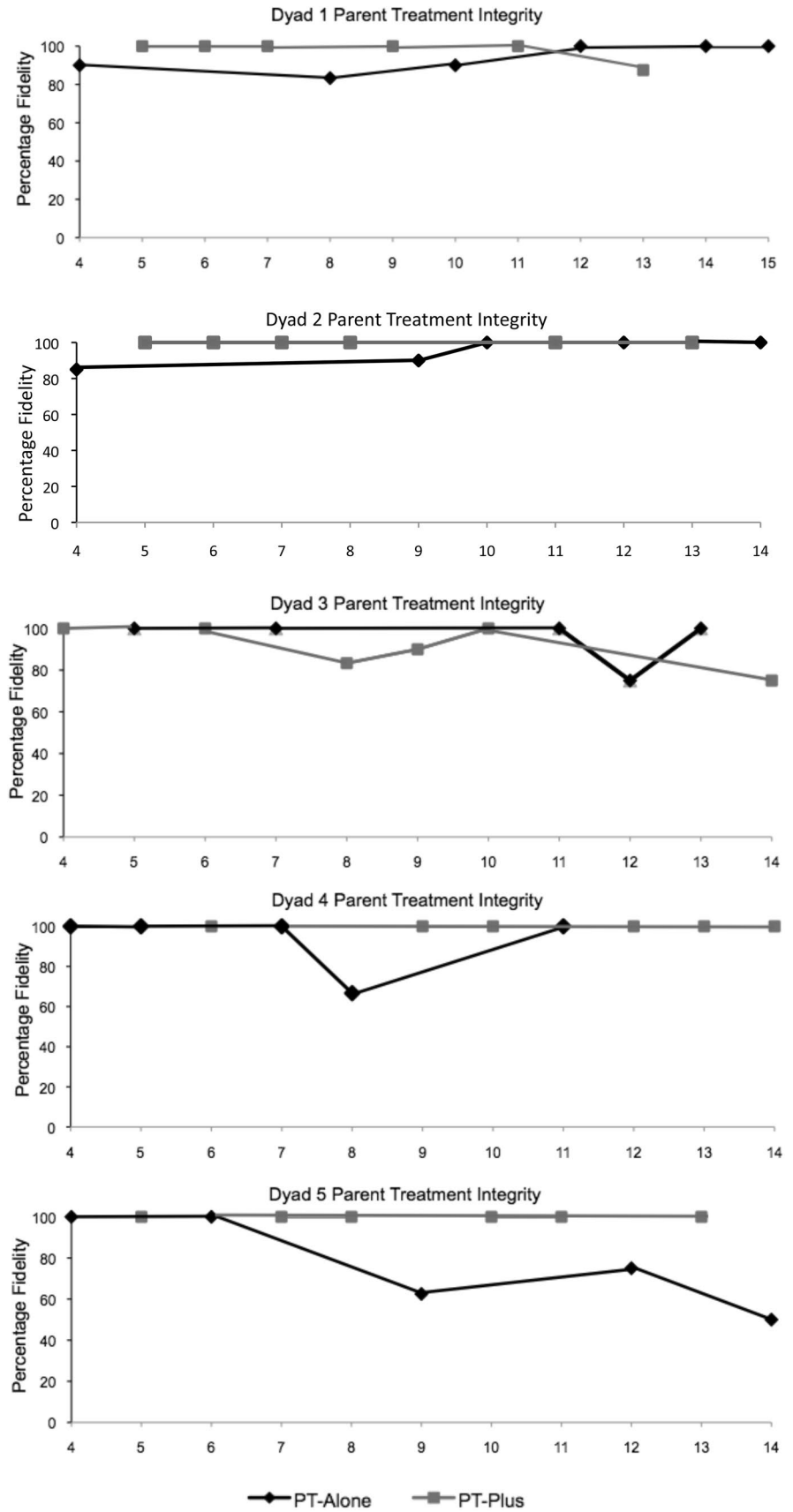


Table 3 Parent treatment integrity for PT-Alone and PT-Plus sessions

Parent-child Dyad	Parent treatment integrity		IOA average (range)
	PT-Alone sessions	PT-Plus session	
Dyad 1. Jared	93.89%	97.92%	100.00%
Dyad 2. Anthony	95.00%	100.00%	92.00% (60.00–100.00%)
Dyad 3. Logan	95.00%	91.39%	100.00%
Dyad 4. Jaden	93.33%	100.00%	100.00%
Dyad 5. Brianna	77.50%	100.00%	100.00%

(e.g., a rating of a “1” v. a “2”), not on the completion of those goals. A consensus of the principal investigator and trained observer’s rating was included in the data.

Parent Behavior Observational Data—Parent Praise

As a measure of change in parenting behavior, parent praise was measured observationally during the 10-min free play following each session. All dyads completed three baseline data points, which displayed a stable trend or a trend in an undesirable direction. For four of five dyads, the percentage of parent praise increased between the baseline and intervention phases. For all dyads the PND was greater between baseline and PT-Plus sessions than between the baseline and PT-Alone sessions. The data for parent praise for each dyad are displayed in Fig. 3 and Table 4.

Child Observational Data—Disruptive Behavior

Child disruptive behavior was measured observationally during the 10-min free play following each session. Disruptive behavior was defined individually for each child (i.e., see Table 1), and data are displayed in Fig. 4 and Table 5. Children from all dyads demonstrated a decrease in disruptive behavior from baseline to intervention sessions. Three of five dyads saw a further increase in disruptive behavior during PT-Plus Sessions compared to PT-Alone Sessions. Two dyads demonstrated changes in behavior that were reflected in a greater PND between baseline and PT-Plus Sessions compared to PND between baseline and PT-Alone Sessions. Notably, for some dyads PND could not be reported due to a floor effect in which one baseline time point included an interval occurrence of 0.00% for disruptive behavior.

Acceptability—Behavior Intervention Rating Scale

Acceptability of the intervention was measured via the BIRS at post-treatment. Four of five dyads reported higher than 96 of 120 on the BIRS, which corresponds with 80% agreement or higher (Table 6).

Discussion and Recommendations

We investigated the effectiveness of a manualized parent-training program and an adjunctive parent-support component in a sample of five parents and children with ASD under the age of five. Following a three-session baseline, all participants received two intervention packages: parent training based on the RUBI Manual (PT-Alone) and parent training based on the RUBI Manual plus a supplemental pre-session parent-support component (PT-Plus). We addressed limitations of previous parent-training treatment studies by collecting data via direct observation of parent and child outcomes. Results comment on the impact of the adjunctive parent-support component on parent treatment integrity, parent praise, child disruptive behavior, and the acceptability of the intervention as a whole. By gaining a better understanding of modifications to a manualized parent-training program, researchers might gain insight into effective practice for parent training within this population.

Parent Treatment Integrity

The primary aim of this study was to examine the impact of the added parent-support component on parent treatment integrity. When parent support was provided prior to the parent-training session, four of five dyads more accurately implemented session-specific goals. It is likely that when the provider attended to a parent’s acute stressors during the parent-support component, parents were better able to focus on learning module-specific skills during the parent training session [12]. The parent-support component alleviated stress and allowed more effective learning to take place [13, 14]. Qualitatively, during PT-Alone sessions, parents often had difficulty focusing on the session material and instead, directed the conversation to stressors that occurred during the previous week. Relatedly, during PT-Alone sessions, parent treatment integrity was not as high as during PT-Plus sessions. Meaningfully programming for parent support during the course of behavioral parent training improved parents’ engagement in parent training and parents’ implementation accuracy. These results suggest that providers could facilitate parent learning by building in a 15-min parent only “check-in” at the beginning of a parent training

Fig. 3 Observation Data of Parent Praise. Interval occurrence during 10-min free play

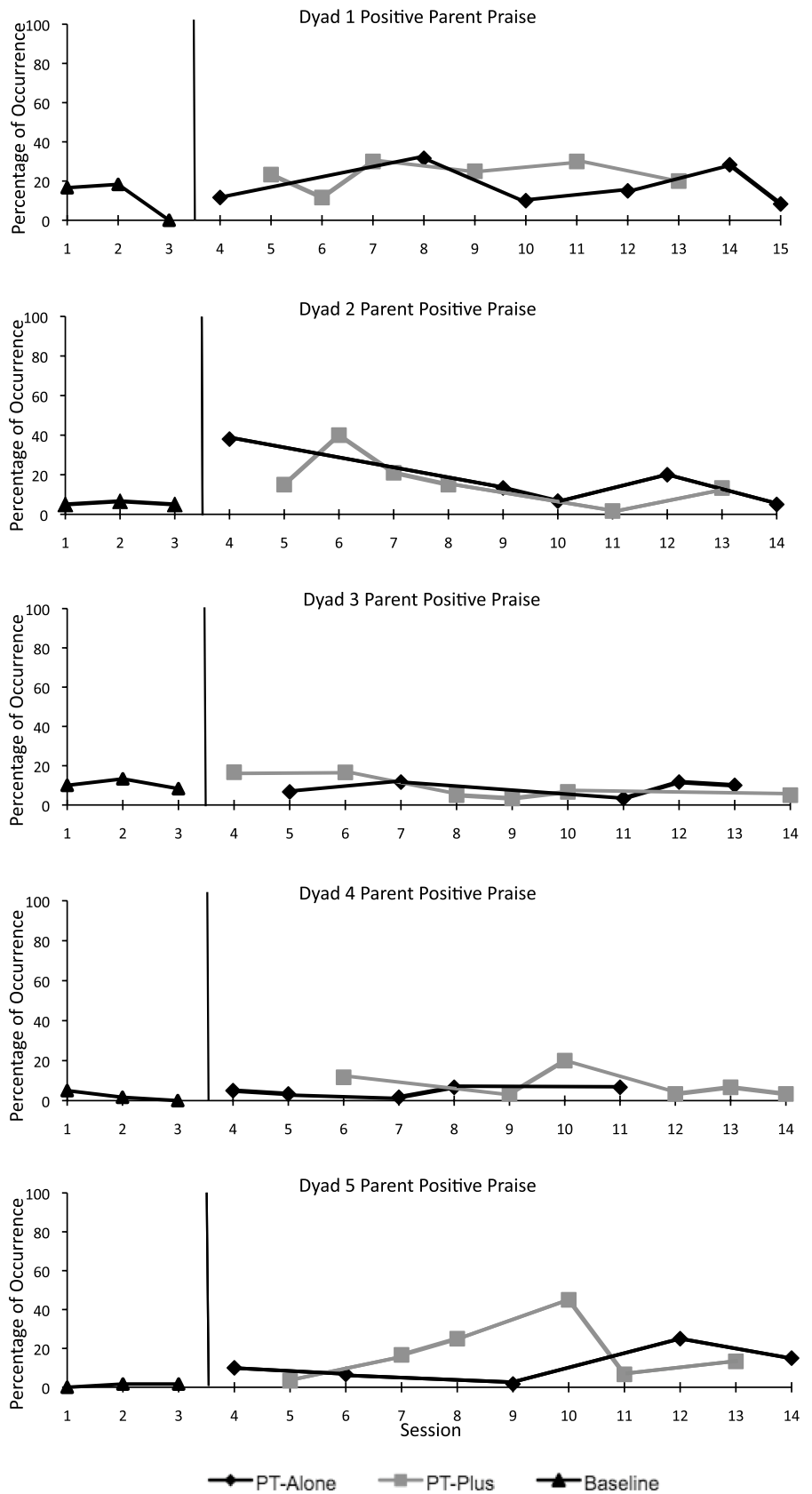


Table 4 Percentage of parent praise in all phases of treatment

Parent-child Dyad	Parent praise baseline phase	Parent praise Intervention phase		Percentage of non-overlapping data		IOA average (range)
		PT-Alone sessions	PT-Plus session	Baseline and PT-Alone sessions	Baseline and PT-Plus sessions	
Dyad 1. Jared	11.63%	17.47%	23.32%	33.33%	83.33%	94.67% (89.47–100.00%)
Dyad 2. Anthony	5.53%	16.60%	17.66%	80.00%	83.33%	97.72% (96.60–98.60%)
Dyad 3. Logan	10.53%	8.66%	8.87%	0.00%	33.33%	97.91% (97.50–98.33%)
Dyad 4. Jaden	6.52%	4.67%	8.06%	40.00%	50.00%	98.92% (97.96–99.16%)
Dyad 5. Brianna	3.34%	11.67%	18.33%	80.00%	100.00%	99.58% (99.58–100.00%)

session. Furthermore, monitoring parent implementation of specific skills during or following the session is imperative to parent treatment integrity. Providers administering formal or informal parent training would better serve families by building in opportunities for practice, feedback and parent support.

Parent Behavior—Parent Praise

For four of five dyads, parent praise increased between baseline and intervention phases. Parent praise was further increased following sessions that included the parent-support component, meaning that more change in parent behavior occurred during PT-Plus sessions [5, 6]. With some immediate stressors alleviated, parents were able to relate to their child in a more positive manner [26].

In considering Dyad 3, less change in behavior was observed relative to other dyads. Observation throughout treatment revealed little emotional reactivity by this mother during session, even when the child was notably distressed. While some progress during treatment was observed, the relatively small change in the child's behavior was likely related to the relatively small change in the parent's behavior. Thus, it is important to acknowledge that not all dyads responded as expected.

Child Disruptive Behavior

Disruptive behaviors decreased with intervention across all five dyads, with three dyads presenting decreased disruptive behavior by a margin close to 10%. This finding provides additional evidence that parent training through the RUBI Manual effectively targets child disruptive behavior. Decreasing child disruptive behavior significantly impacts a child's ability to access opportunities to learn adaptive skills, use effective communication strategies, and engage

in positive peer interactions [42]. Regarding parent benefits, multiple studies have cited disruptive behaviors as more stressful than core symptoms of ASD [16] and some predict parental stress based on the presence of disruptive behaviors [15]. The impact of decreasing child disruptive behaviors is far-reaching, as it allows meaningful participation of both the child and the parent in skill-building therapies. Results of this study provider further support for the RUBI manual as an intervention to decrease child disruptive behavior in this population.

Differences in child disruptive behaviors were not perceived between PT-Alone and PT-Plus sessions. While changes in parent behavior certainly impact child behavior, these findings indicate that the impact does not occur immediately. Future research could measure child behavior change at intervals following treatment in order to elucidate the amount of time for new parent behavior to impact child behavior. Investigation could include monitoring of a specific parent skill, like parent praise or planned ignoring, over time to determine when a change in a related child behavior occurs.

Acceptability

The majority of parents reported strong levels of acceptability of the study overall, resulting in an average score of 108.8 of 120 (range = 92–115), which exceeds the acceptability cut-off of 96 and corresponds with 90% overall agreement. Despite a small sample size, it can be assumed that this intervention was acceptable to the majority of participants and would be acceptable to parents within a similar context. Thus, the acceptability of the RUBI Manual is supported by these results [37], and its acceptability was maintained with the addition of the parent-support component.

For the participant who reported lower acceptability (92 of 120), the child in this dyad demonstrated more severe

Fig. 4 Observational Data Child Disruptive Behavior. Percentage of interval occurrence during 10-min free play

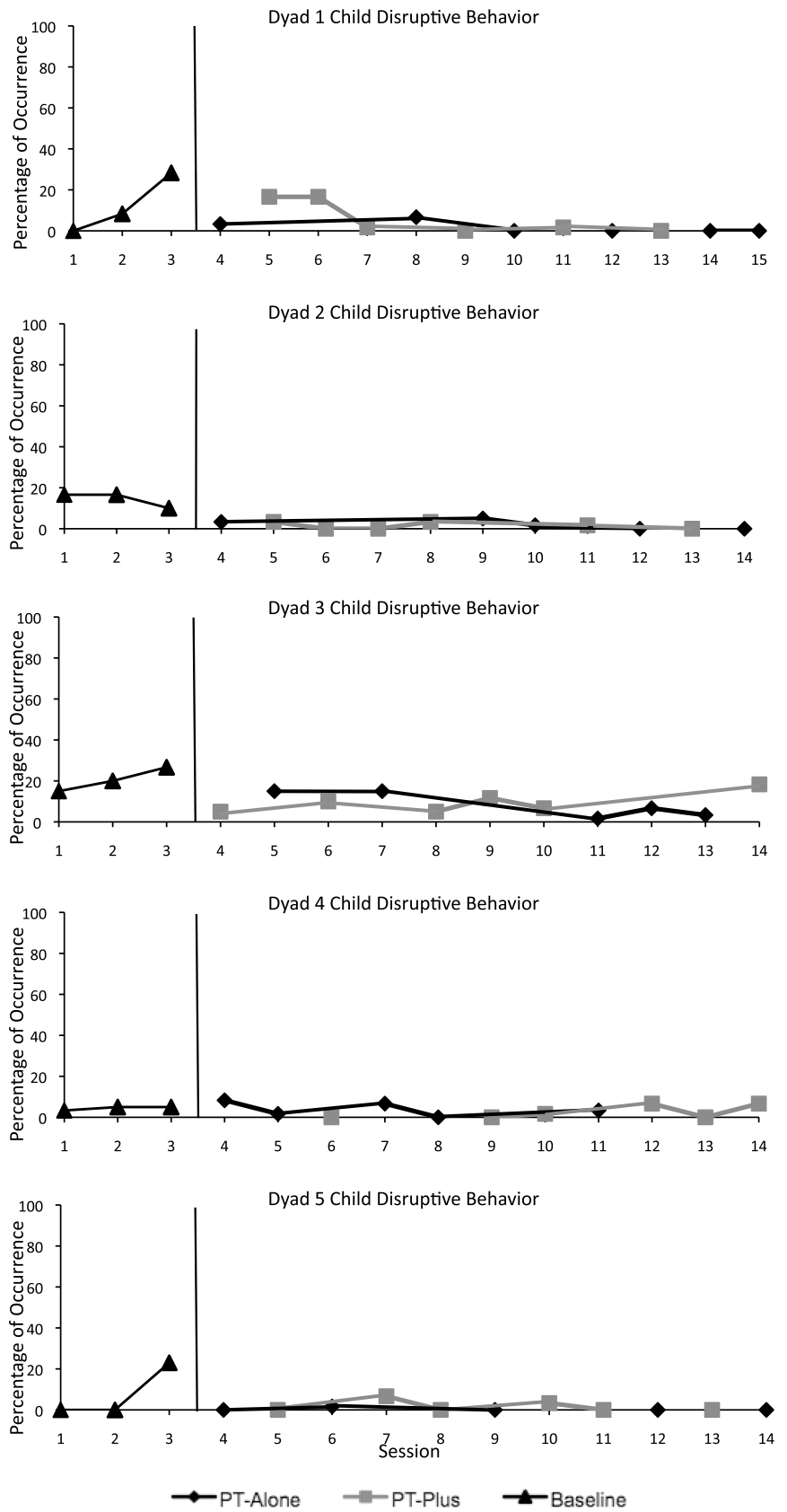


Table 5 Percentage of child disruptive behavior in all phases of treatment

Parent-child Dyad	Child disruptive behavior Baseline phase	Child disruptive behavior Intervention phase		Percentage of non-overlapping data		IOA average (range)
		PT-Alone sessions	PT-Plus sessions	Baseline and PT-Alone sessions	Baseline and PT-Plus sessions	
Dyad 1. Jared	12.20%	1.66%	6.09%	N/A	N/A	94.67% (89.47–100.00%)
Dyad 2. Anthony	14.40%	1.99%	1.39%	100.00%	100.00%	97.72% (96.60–98.60%)
Dyad 3. Logan	20.56%	8.33%	9.45%	60.00%	83.33%	97.91% (97.50–98.33%)
Dyad 4. Jaden	4.44%	3.99%	2.50%	60.00%	66.67%	98.92% (97.96–99.16%)
Dyad 5. Brianna	5.75%	0.33	1.67%	N/A	N/A	99.58% (99.58–100.00%)

impairment in terms of core symptoms of ASD, including deficits in social reciprocity and language impairment (i.e., deficits that would not be expected to be impacted by this parent-training intervention). “Slight disagreement” was indicated related to how well the intervention corresponded with the child’s problem behavior. Thus, it appears that the ratings provided by the mother in this dyad reflect her continued concerns regarding the child’s behaviors related to core neurological deficits, rather than continued disruptive behaviors.

Clinical Considerations

Parent-Support Component

Inclusion of the parent-support component was intended to provide protected time for the parent to express concerns and elicit support from the therapist related to parental stress. Based on previous research, the parent-support component was designed to facilitate the development of the therapeutic alliance [43, 44], increase attendance and adherence [45], and allow for flexibility within a manualized program, all with the intention of increasing treatment outcomes. The results of the current study indicate that even 15-min of parent support impacted parent treatment integrity and parent skill acquisition. Results of this study recommend that administration of manualized parent

training programs include an intentional parent-support component to improve participation and outcomes.

Comparison of PT-Alone and PT-Plus sessions revealed qualitative observations that provide insight into effective aspects of the parent-support component. Each session of the RUBI manual begins with a review of homework from the previous week and a brief recap of previously learned skills. Parents often were distracted during this review and chose to update the therapist on external matters related to parental stress, rather than discussing their implementation of module-specific skills. During PT-Alone sessions, this altered the pace of the session and the parent’s ability to engage with the parent-training module. Across families, parent treatment integrity was lower during PT-Alone sessions compared to PT-Plus sessions. Creating space and explicit therapeutic programming for individualization and support for parent concerns, including those outside of the behavior targeted in the manual, increased treatment effectiveness and efficiency of the session.

A second qualitative observation was that the parent-support component might have served as a reward for new parent behavior. The individualized parent attention and praise given to the parent for efforts made may have positively reinforced a parent’s effort and behavior change. In part, the reward of therapeutic support may have contributed to all parents completing all 14 sessions. It is not a novel concept that providing a desired outcome contingent upon the occurrence of a desired behavior is a powerful tool for behavior change [46]; given the difficulty inherent in parent behavior change, positive reinforcement is likely similarly beneficial for parents. Reinforcement can be incorporated meaningfully into parent training work, even through directed positive praise from the provider. Future studies could systematically provide positive reinforcement for change in parent behavior by measuring verbal praise given by the provider or include additional

Table 6 Behavior Intervention Rating Scale Scores by participant at post-treatment

Parent-child Dyad	BIRS Score
Dyad 1. Jared	92/120
Dyad 2. Anthony	115/120
Dyad 3. Logan	115/120
Dyad 4. Jaden	110/120
Dyad 5. Brianna	112/120

reinforcement, like compensation, for completing homework tasks.

Lastly, the parent-support component supported the therapeutic alliance. In a typical manualized parent-training program, parents are expected to discuss only topics related to the child and more specifically, the success or failure of learned skills. This inflexible design restricts participant engagement because it does not create a space for parents to express concerns or disagreement. In Dyad 5, the mother expressed strong disagreement with the use of planned ignoring as instructed in the module. The following parent-support component in the PT-Plus session was imperative to gain a better understanding of the mother's beliefs related to planned ignoring and to validate the mother's emotional experience. Without this opportunity to repair the therapeutic relationship, it is doubtful whether the dyad would have completed the treatment sessions, and if the mother would have been willing to learn additional behavioral skills. Implications for future practice include intentional focus on supporting parents' private events related to implementation and encouraging collaboration. It appears essential that providers administering manualized interventions provide protected space for parent feedback, collaboration upon goals, and processing parent discomfort or confusion. This study provides evidence for doing so in 15-min increments periodically during treatment.

Limitations and Future Directions

Though the results of the current investigation support the effectiveness of the intervention in increasing parent treatment integrity and increasing parent praise, limitations must be noted, including the limited sample size. Though a sample of five is common in behavioral research, especially within developmental disabilities, it is possible that the results are not generalizable to other children with ASD, given the idiosyncratic nature of individual presentations of ASD. Additionally, while the intervention was designed to be administered over 14 weeks, due to holidays and scheduling conflicts families completed the intervention in 16–24 weeks. The increased number of weeks necessary for some families to complete the intervention potentially introduced variability into the course of treatment. Pacing of parent-training sessions may be an important variable to assess in future research and its impact on parent and child outcomes.

Future research could examine the impact of various "doses" of the parent-support component. The 15-min "dose," or duration of time spent administering the parent-support component, resulted in a considerable increase in parent engagement, even when administered during only 50% of intervention sessions. The increase in parent treatment integrity indicates that this amount of time was enough

to alleviate some parental stress during the session. Longer doses of the parent-support component may impact overall parental stress more directly [20]. Another question that could be considered is how much time is needed in order to see significant change in child disruptive behavior. From the results of this study, it is unclear for what amount of time new parent behavior must be consistent before the child's behavior changes. Thus, increased duration of the parent-support component or increased duration of time in treatment may improve child treatment outcomes.

In this sample, there were a few instances of low rates of child disruptive behavior in the baseline observational data. Despite the low occurrence of disruptive behaviors during baseline, these dyads were included in the study due to description of substantial disruptive behaviors at home and the primary focus on parent treatment integrity/engagement. Relatedly, there were some limitations in the structure of the observation period. To assess the impact of the session on parent and child variables, it was necessary that the observation period follow the parent-training session. However, during the free play observation the child had full access to parent attention. It became clear that even if disruptive behavior was present in excess during the parent-training session, once the parent turned her full attention to the child, the child often did not engage in disruptive behavior because all needs were being met. Thus, the amount of disruptive behavior at home and at other points in the session was higher than what was represented in the observation sessions. Future research could explore alternative ways of capturing disruptive behavior, like collecting an interval frequency during the parent training session. Another strategy may be to structure the observation session to include purposeful functional behavioral analysis techniques in which attention or preferred items are withheld from each child for a set amount of time during each observation period in order to provide equal opportunity for disruptive behavior during each observation.

Summary

The results of the current investigation support the effectiveness of the addition of the parent-support component to further the impact of the RUBI Manual by increasing parent treatment integrity and impacting parent behavior. These results support previous findings on the effectiveness of the RUBI Manual and expand its effectiveness to include a clinic population and administration by a doctoral level provider [32]. Results suggest that meaningfully programming for parent support during the course of behavioral treatment for children with ASD improved parents' engagement in treatment and parents' ability to implement learned parenting skills, specifically praise. While child disruptive

behavior decreased overall, it is unclear if disruptive behavior decreased to a greater degree following PT-Plus sessions. It is important to note that adding a pre-session parent-support component for half of treatment sessions did not negatively impact the acceptability of the manualized intervention.

The results expand the literature by supporting a model of change for parenting behaviors in a complex clinical population. Aspects of the parent-support component that contributed to improved outcomes include support for unique parental stress, addressing barriers to treatment, and improved therapeutic alliance. Participation in the parent-support component encouraged engagement in parent training, which resulted in increased treatment integrity; increased parent treatment integrity led to increased parenting skills, like parent praise. Increased parenting skills likely contributed to the decrease in child disruptive behavior and the acceptability of the treatment. Taken together, this begins to provide a rough model of how behavior change may occur in this clinical population. Future research is warranted to investigate the cascading impact of increased parenting skills on child-related outcomes. The results of the current study provide support for including a parent-support component as an effective practice for parent training, especially within this specialized population.

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Declarations

Conflict of interest The authors of this article do not have any financial, personal, or professional conflict of interest related to the content of the current study.

References

- Dishion T, Andrews OW (1995) Preventing escalation in problem behaviors with high-risk young adolescents: immediate and 1-year outcomes. *J Consult Clin Psychol* 63:538–548. <https://doi.org/10.1037/0022-006X.63.4.538>
- Baker CN, Arnold DH, Meagher S (2011) Enrollment and attendance in a parent training prevention program for conduct problems. *Prev Sci* 12:126–138. <https://doi.org/10.1007/s11121-010-0187-0>
- Forehand R, Middlebrook J, Rogers T, Steffe M (1983) Dropping out of parent training. *Behav Res Ther* 21(6):663–668. [https://doi.org/10.1016/0005-7967\(83\)90084-0](https://doi.org/10.1016/0005-7967(83)90084-0)
- Perepletchikova F, Treat TA, Kazdin AE (2007) Treatment integrity in treatment outcome research: analysis of the studies and examination of the associated factors. *J Consult Clin Psychol* 75(6):829–841. <https://doi.org/10.1037/0022-006X.75.6.829>
- Moncher FJ, Prinz RJ (1991) Treatment fidelity in outcome studies. *Clin Psychol Rev* 11:247–266. [https://doi.org/10.1016/0272-7358\(91\)90103-2](https://doi.org/10.1016/0272-7358(91)90103-2)
- Eames C, Daley D, Hutchings J, Whitacker CJ, Jones K, Hughes JC, Bywater T (2009) Treatment fidelity as a predictor of behaviour change in parents attending group-based parent training. *Child: Care Health Dev* 35(5):603–612. <https://doi.org/10.1111/j.1365-2214.2009.00975.x>
- Fryling MJ, Wallace MD, Yassine JN (2012) Impact of treatment integrity on intervention effectiveness. *J Appl Behav Anal* 45:449–453. <https://doi.org/10.1901/jaba.2012.45-449>
- Fallon LM, Collier-Meek MA, Sanetti LMH, Feinberg AB, Kratochwill TR (2015) Implementation planning to promote parents' treatment integrity of behavioral interventions for children with autism. *J Educ Psychol Consult* 26(1):87–109. <https://doi.org/10.1080/10474412.2015.1039124>
- Skinner BF (1974) *About behaviorism*. Knopf, New York
- Carr T, Lord C (2016) A pilot study promoting participation of families with limited resources in early autism intervention. *Res Autism Spectr* 2:87–96. <https://doi.org/10.1016/j.rasd.2016.02.003>
- Reyno SM, McGrath PJ (2006) Predictors of PMT efficacy for child externalizing behavior problems: a meta-analytic review. *J Child Psychol Psychiatry* 47:99–111. <https://doi.org/10.1111/j.1469-7610.2005.01544.x>
- Kalichman SC, Grebler TC (2010) Stress and poverty predictors of treatment adherence among people with low-literacy living with HIV/AIDS. *Psychosom Med* 72(8):810–816. <https://doi.org/10.1097/PSY.0b013e3181f01be3>
- Arnsten AFT (2009) Stress signaling pathways that impair prefrontal cortex structure and function. *Nat Rev Neurosci* 10(6):410–422. <https://doi.org/10.1038/nrn2648>
- Cerqueira JJ, Mailliet F, Almeida OFX, Jay TM, Sousa N (2007) The prefrontal cortex as a key target of the maladaptive response to stress. *J Neurosci* 27(11):2781–2787. <https://doi.org/10.1523/JNEUROSCI.4372-06.2007>
- Estes A, Olson E, Sullivan K, Greenson J, Winter J, Dawson G, Munson J (2013) Parenting-related stress and psychological distress in mothers of toddlers with autism spectrum disorders. *Brain Dev* 35:133–138. <https://doi.org/10.1016/j.braindev.2012.10.004>
- Lecavalier L, Leone S, Wiltz J (2006) The impact of behaviour problems on caregiver stress in young people with autism spectrum disorders. *J Intellect Disabil Res* 50:172–183. <https://doi.org/10.1111/j.1365-2788.2005.00732.x>
- Hayes SA, Watson SL (2013) The impact of parenting stress: a meta-analysis of studies comparing the experience of parenting stress in parents of children with and without autism spectrum disorder. *J Autism Dev Disord* 43:629–642. <https://doi.org/10.1007/s10803-012-1604-y>
- Baker-Ericzen M, Brookman-Frazee L, Stahmer A (2005) Stress levels and adaptability in parents of toddlers with and without autism spectrum disorders. *Res Pract Pers Sev Disabil* 30:194–204. <https://doi.org/10.2511/rpsd.30.4.194>
- Kaat AJ, Lecavalier L (2013) Disruptive behavior disorders in children and adolescents with autism spectrum disorders: a review of the prevalence, presentation, and treatment. *Res Autism Spectr Disord* 7:1579–1594. <https://doi.org/10.1016/j.rasd.2013.08.012>
- Kazdin AE, Whitley MK (2003) Treatment of parental stress to enhance therapeutic change among children referred for aggressive and antisocial behavior. *J Consult Clin Psychol* 71(3):504–515. <https://doi.org/10.1037/0022-006x.71.3.504>
- Gottman JM (1993) Conflict engagement, escalation, and avoidance in marital interaction: a longitudinal view of five types of couples. *Consult Clin Psychol* 61(1):6–15. <https://doi.org/10.1037/0022-006X.61.1.6>

22. Caspi A, Moffitt TE, Morgan J, Rutter M, Taylor A, Arseneault L, Tully L, Jacobs C, Kim-Cohen J, Polo-Tomas M (2004) Maternal expressed emotion predicts children's antisocial behavior problems: using monozygotic-twin differences to identify environmental effects on behavior development. *Dev Psychol* 40:149–161. <https://doi.org/10.1037/0012-1649.40.2.149>
23. Hastings RP, Daley D, Burns C, Beck A (2006) Maternal distress and expressed emotion: cross-sectional and longitudinal relationships with behavior problems of children with intellectual disabilities. *Am J Ment Retard* 111:48–61. [https://doi.org/10.1352/0895-8017\(2006\)111\[48:MDAEEC\]2.0.CO;2](https://doi.org/10.1352/0895-8017(2006)111[48:MDAEEC]2.0.CO;2)
24. Greenberg JS, Seltzer MM, Hong J, Orsmond GI (2006) Bidirectional effects of expressed emotion and behavior problems and symptoms in adolescents and adults with autism. *Am J Ment Retard* 111:229–249. [https://doi.org/10.1352/0895-8017\(2006\)111\[229:BEOEEA\]2.0.CO;2](https://doi.org/10.1352/0895-8017(2006)111[229:BEOEEA]2.0.CO;2)
25. Smith LE, Greenberg JS, Seltzer MM, Hong J (2008) Symptoms and behavior problems of adolescents and adults with autism: effects of mother-child relationship quality, warmth, and praise. *Am J Ment Retard* 113(5):387–402. <https://doi.org/10.1352/2008.113:387-402>
26. Sanders MR, Dadds MR, Bor W (1989) Contextual analysis of child oppositional and maternal aversive behaviors in families of conduct-disordered and nonproblem children. *J Clin Child Psychol* 18:72–83. https://doi.org/10.1207/s15374424jccp1801_9
27. Dumas JE, Wahler RG (1985) Indiscriminate mothering as a contextual factor in aggressive-oppositional child behavior: “damned if you do, damned if you don't.” *J Abnorm Child Psychol* 13:1–17. <https://doi.org/10.1007/BF00918368>
28. Wahler RG, Dumas JE (1989) Attentional problems in dysfunctional mother-child interactions: an interbehavioral model. *Psychol Bull* 105:116–130. <https://doi.org/10.1037/0033-2909.105.1.116>
29. Bearss K, Johnson C, Handen B, Butter E, Lecavalier L (2015) Parent training for disruptive behaviors. In: Scahill L, Smith T (eds) *The RUBI autism network*
30. Lord C, Rutter M, DiLavore PC, Risi S, Gotham K, Bishop SL (2012) *Autism diagnostic observation schedule*, 2nd edn. WPS Publishing, Torrance
31. Elliott SN, Treuting MV (1991) The behavior intervention rating scale: development and validation of a pretreatment acceptability and effectiveness measure. *J Sch Psychol* 29:45–51. [https://doi.org/10.1016/0022-4405\(91\)90014-I](https://doi.org/10.1016/0022-4405(91)90014-I)
32. Bearss K, Johnson C, Handen B, Smith T, Scahill L (2013) A pilot study of parent training in young children with autism spectrum disorders and disruptive behavior. *J Autism Dev Disord* 43(4):829–840. <https://doi.org/10.1007/s10803-012-1624-7>
33. Bearss K, Lecavalier L, Minshawi N, Johnson C, Smith T, Handen B, Sukhodolsky D, Aman M, Swiezy N, Butter E, Scahill L (2013) Toward an exportable parent training program for disruptive behaviors in autism spectrum disorders. *Neuropsychiatry* (London) 3(2):169–180. <https://doi.org/10.2217/npv.13.14>
34. Aman MG, McDougle CJ, Scahill L, Handen B, Arnold LE, Johnson C, Stigler KA, Bearss K, Butter E, Swiezy NB, Sukhodolsky DD, Ramadan Y, Pozdol SL, Nikolov R, Lecavalier L, Kohn AE, Koenig K, Hollway JA, Wagner A (2009) Medication and parent training in children with pervasive developmental disorders and serious behavior problems: results from a randomized clinical trial. *J Am Acad Child Adolesc Psychiatry* 48:1143–1154. <https://doi.org/10.1097/chi.0b013e3181bf6669>
35. Bearss K, Johnson C, Smith T, Lecavalier L, Swiezy N, Aman M, Scahill L (2015) Effects of parent training versus parent education on behavioral problems in children with autism spectrum disorder: a randomized clinical trial. *J Am Med Assoc* 313:1525–1533. <https://doi.org/10.1001/jama.2015.3150>
36. Scahill L, McDougle CJ, Aman MG, Johnson C, Handen B, Bearss K et al (2012) Effects of risperidone and parent training on adaptive functioning in children with pervasive developmental disorders and serious behavioral problems. *J Am Acad Child and Adolesc Psychiatry* 51(2):136–146. <https://doi.org/10.1016/j.jaac.2011.11.010>
37. Research Units on Pediatric Psychopharmacology (RUPP) Autism Network (2007) Parent Training for children with pervasive developmental disorders: a multi-site feasibility trial. *Behav Interv* 22(3):179–199. <https://doi.org/10.1002/bin.236>
38. Repp AC, Deitz DEE, Boles SM, Deitz SM, Repp CF (1976) Differences among common methods for calculating interobserver agreement. *J Appl Behav Anal* 9(1):109–113. <https://doi.org/10.1901/jaba.1976.9-109>
39. Freer P, Watson TS (1999) A comparison of parent and teacher acceptability ratings of behavioral and conjoint behavioral consultation. *Sch Psychol Rev* 28:672–684. <https://doi.org/10.1080/02796015.1999.12085993>
40. Cohen J (1988) *Statistical power analysis for the behavioral sciences*, 2nd edn. Lawrence Erlbaum, Hillsdale
41. Scruggs TE, Mastropieri MA, Casto G (1987) The quantitative synthesis of single subject research: methodology and validation. *Remedial Spec Educ* 8:24–33. <https://doi.org/10.1177/074193258700800206>
42. Guevremont DC, Dumas MC (1994) Peer relationship problems and disruptive behaviors. *J Emot Behav Disord*. <https://doi.org/10.1177/106342669400200304>
43. Axford A, Lehtonen M, Kaoukji D, Tobin K, Berry V (2012) Engaging parents in parenting programs: lessons from research and practice. *Child Youth Serv Rev* 34:2061–2071. <https://doi.org/10.1016/j.childyouth.2012.06.011>
44. Kazdin AE, Whitely M, Marciano PL (2006) Child-therapist and parent-therapist alliance and therapeutic change in the treatment of children referred for oppositional, and aggressive, and antisocial behavior. *J Child Psychol Psychiatry* 47:436–445. <https://doi.org/10.1111/j.1469-7610.2005.01475.x>
45. Sterrett E, Jones DJ, Zalot A, Shook S (2010) A pilot study of a brief motivational intervention to enhance parental engagement: a brief report. *J Child Fam Stud* 19:697–701. <https://doi.org/10.1007/s10826-010-9356-9>
46. Kazdin AE (1994) *Behavior modification in applied settings*, 5th edn. Brooks Cole, Pacific Grove

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