A Case Study of Parent-Child Interaction Therapy for a Young Child with Autism Spectrum Disorder: Behavioral and Developmental Considerations

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Abstract

Externalizing behaviors and impairments in communication and adaptive functioning are the core defining features of the autism spectrum disorder (ASD). They are also the primary focus of interventions for children with ASD, as these conditions impact both the child's adaptive behavior and parental mental health. This study examined the effectiveness of Parent-Child Interaction Therapy (PCIT) utilizing a case study of a 4-year-old boy diagnosed with ASD and comorbid disruptive behavior disorder. Behavioral observation data and psychometric tools with ecological validity were used across all assessments to evaluate intervention outcomes as assessed by the caregiver and the teacher. Results of both caregiver and teacher reports and observations indicated that 1) PCIT was effective in decreasing disruptive behaviors and improving parenting skills while reducing parental stress, and that 2) intervention gains had been maintained at the 3-month follow-up. Although the nature of this single case experimental study is a limitation, this article replicates and advances previous research examining PCIT success with children with autism and their parents while providing clinical implications for improving children's adaptive behavior in a short time.

1. Introduction

Autism spectrum disorder (ASD) is a lifelong developmental disability characte-

rized by pervasive deficits in social understanding and communication, poor adaptive functioning, and the presence of stereotypical behaviors and interests (American Psychiatric Association, 2013). Although behavioral abnormalities in children with ASD are diagnosed in early childhood; certain dysfunctional behaviors may become more apparent as children mature and external expectations increase beyond their coping resources and parental or educational support. The frequency of ASD diagnoses continues to rise, with some studies suggesting that 1% of the global population has ASD (Centers for Disease Control and Prevention, 2014). The estimated prevalence of ASD in the United States is 1 in every 59 children aged eight years, with four times as many boys affected as girls (Baio et al., 2018). Additionally, ASD prevalence in Europe appears to be close to the prevalent estimates recorded in the United States and Asia (Duchan & Patel, 2012). As the prevalence of ASD has been rapidly increasing during the few last decades, it has become a critical public health concern. Problems associated with ASD include lifelong care and education costs related to high rates comorbidity and stress throughout development (Wood & Gadow, 2010).

Studies suggest that 50% - 80% of children and adolescents with ASD—including higher-functioning individuals—present with comorbid disruptive behavior (Bauminger, Solomon, & Rogers, 2010; Kanne & Mazurek, 2011) beyond the core symptoms associated with ASD. Furthermore, approximately one in four diagnosed children meet full diagnostic criteria for disruptive behavior disorder (Masse, McNeil, Wagner, & Quetsch, 2016; Kaat & Lecavallier, 2013), which represents one of the most common reasons for referral to mental health clinics. Studies indicate that the prevalence of comorbid behavior difficulties is significantly higher in individuals with ASD than in the general population (Mannion & Leader, 2013). However, the exact prevalence of clinically significant behavior problems in children with ASD cannot be successfully estimated, as such studies typically include clinically referred samples (Brereton, Tonge, & Einfeld, 2006), and diverging conceptualizations of "problematic behavior".

As is common in ASD research, the nature and severity of behavior problems vary considerably among individuals, depending on age, cognitive development, and social capabilities (Wijnhoven, Creemers, Vermulst, & Granic, 2018). Specifically, toddlers and young children with ASD show a variety of co-occurring externalizing behavior, ranging from hyperactivity to physical aggression and defiance; older children and adolescents, however, demonstrate comorbid clinical concerns such as obsessive-compulsive disorder, depression, oppositional defiant disorder, conduct disorder, tic disorders, and sleep problems (Hartley, Sikora, & McCoy, 2008). If left untreated behavior problems in childhood become established and can cause barriers to learning and socialization, impeding intervention progress (Lindor, Sivarathan, May, Stefanac, Howells, & Rinehart, 2019). Additionally, elevated behavior problems in ASD reduce the quality of life of children and their families and contribute to parental stress (McStay, Trembath,

& Dissanayake, 2015).

ASD intervention literature indicates that early identification and developmentally appropriate treatments remain urgent clinical and educational priorities; this is particularly true for children younger than age three, as their increased brain plasticity allows for quicker and greater behavior changes (Dawson, 2008). Despite the many behavioral and educational treatments that have been developed for ASD (Papadopoulos, 2018), the American Psychological Association (APA) only recognizes a few interventions as efficacious or potentially efficacious (McLeod, Wood, & Klebanoff, 2015). Applied behavior analysis and early intensive behavioral intervention have been implemented as evidence-based treatments for children with ASD. These aim to increase functional behavior, teach new skills, and reduce symptom severity (Butter, Mulick, & Metz, 2006; Van Steensel, Bogels, & Perrin, 2011). However, such behavioral interventions have been criticized for their generalization of teaching skills, lack of developmental perspective, and high treatment costs (Tews, 2007). Hence, in moving toward more effective interventions, behavioral treatments have become more flexible and more natural (e.g., skills building in a natural setting), integrating developmental orientations involving caregivers in skills training and including child-led play and developmental learning experiences (Schreibman et al., 2015).

The elements of Parent-Child Interaction Therapy (PCIT) in ASD treatments focus on the importance of parent and family involvement as "best practices that should be incorporated into any services offered to children with ASD" (Smith & Iadarola, 2015). As a growing number of clinicians seek rapid and efficacious interventions to treat disruptive behaviors of children with ASD, PCIT has shown substantial positive effects on parent and child behavior (Bagner & Eyberg, 2007). Promising preliminary research indicates that PCIT successfully reduces externalizing behavior and increases the socio-emotional reciprocity of children with ASD that display differing levels of intellectual and social functioning (Scudder, Wong, Ober, Hoffman, Toscolani, & Handen, 2019; Ginn, Clionsky, Eyeberg, Warner-Metzger, & Abner, 2017). However, more research is needed to determine whether PCIT is an effective treatment for children on the autism spectrum with co-occurring behavioral difficulties and their families.

2. Parent-Child Interaction Therapy (PCIT)

PCIT is an empirically supported intervention designed to treat behavioral, emotional, and developmental disorders in children aged 2 to 7 years old; this intervention integrates perspectives from play therapy and attachment theory (Lienaman, Brabson, Highlander, Wallance, & McNeil, 2017). Research has documented PCIT efficacy for 3 to 6 years post-treatment (Budd, Hella, Bae, Mayerson, & Watkin, 2011). PCIT strengthens the parent-child relationship by fostering positive parenting skills, which, in turn, results in positive child out-

comes. PCIT has two phases: Child-Directed Interaction (CDI) and Parent-Directed Interaction (PDI). In the didactic session, a therapist first teaches the parent individually using role play. Then, they provide a coaching session in which the parent and child play together. Using a one-way mirror, the therapist discreetly observes and helps the parent to practice and master the skills by providing support, reinforcement, and corrective feedback through "bug-in-the ear" technology. The therapist also reviews the parent's progress in the learned skills (i.e., the homework from the previous session) and codes parent-child interactions using the Dyadic Parent-Child Interaction Coding System (DPICS; Eyberg, Nelson, Duke, & Boggs, 2005) for the first 5 minutes of each session.

CDI aims to enhance parent-child playtime, teaching parents to apply positive parenting skills by using "Do" skills (behavioral description, reflection, labeled praise, imitation, and enjoyment/enthusiasm) and avoiding "Don't" skills (commands, questions, negative talk) to reinforce appropriate behavior and build a safe emotional zone for their children. During PDI, parents are taught to manage their child's behavior using effective commands and to provide consistent consequences for both child compliance and noncompliance, while encouraging the use of the skills learned in CDI. After mastering CDI and PDI skills, parents implement them with the child across various settings. To complete treatment, parents must demonstrate mastery in PDI skills and feel confident in managing the child's behavior; moreover, the child's behavior ratings must fall within the normal range in at least one standardized behavioral measurement (Eyberg & Funderburk, 2011).

3. Objectives of the Study

This study describes an example of PCIT in an outpatient child mental health clinic, which is a useful transition point from controlled research university settings into real world service settings in the community. The intervention meets Weisz, Doss, & Hawley's (2005) criteria for clinical representativeness in terms of participant enrollment and treatment-seeking in a clinical setting as part of a routine service. This case study aims to illustrate PCIT implementation with a 4-year-old-boy diagnosed with ASD and disruptive behavior. Additionally, this study presents the treatment effects by 1) establishing improvements in his overall behavioral functioning as evidenced by a parent/teacher report, and 2) demonstrating a reduction in the mothers' self-reported stress.

4. Materials and Methods

4.1. Case Description

At the time of the study, Aris (a pseudonym for anonymity) was a 4-year-old Caucasian boy living with his parents and attending a mainstream public kindergarten. His father worked as an engineer and his mother stayed home to care for him; the family was in the middle-income range. Greek was the only language spoken at home. Aris was diagnosed with ASD according to DSM-5 crite-

ria at the age of 40 months by a pediatric mental health multidisciplinary team. Further, during the identification procedure an IQ assessment using the Wechsler Preschool and Primary Scale of Intelligence-Third Edition was conducted in order to ensure that the child's overall level of intellectual abilities fell within the average range.

According to the initial PCIT assessment, Aris was identified as having a disruptive behavior disorder (not otherwise specified) in addition to ASD. Presenting concerns included physical aggression and defiance toward parents, teacher, and classmates, noncompliance with social rules, and an inability to successfully engage in social interactions; these issues manifested in various social contexts. Aris and his family received several treatments before they brought him to the clinic, including speech and occupational therapies, parent consultations, and special education.

Aris' parents described him as a difficult child with strange and oppositional behaviors; these include difficulty in making transitions, in self-managing unexpected changes in his daily routine, and in coping when his parents tell him "no." In such cases, he would hit his parents, scream, and kick his legs; these behaviors were very difficult for his parents to control and manage effectively. In the kindergarten classroom, he had difficulty engaging in conversation with peers and had major issues in effectively attending the general curriculum and meeting academic goals; he frequently ran away from the class.

4.2. Developmental and Psychosocial History

Aris was a full-term healthy boy who was delivered with no complications and cried after birth. There were no medical or sensory concerns aside from seasonal allergies and sleep issues. As he grew older, Aris began waking during the night to join his parents in their bed, which resulted in fewer sleeping hours than recommended for a child of his age. His pediatrician prescribed melatonin to improve his sleep, but his parents decided not to administer it. Aris reached the normal fine motor development milestones on time, but his planning and sequencing abilities were slightly delayed. Additionally, his acquisition of communicative and language milestones was severely impaired, which is consistent with the development of children with ASD, as reported in previous studies (Leasack, Bearss, Celano, & Sharp, 2014).

Aris was assessed for early intervention at the age of 36 months; speech and occupational therapy were provided for 90 minutes each week, with limited results. During this time, Aris began exhibiting certain non-functional habits and severe disruptive and repetitive behaviors, particularly when being told to stop a preferred activity and follow a teacher's directions or when staying with a group of children during school activities.

Regarding social development, Aris demonstrated severe impairment in the theory of mind abilities (e.g. difficulty of understanding others' beliefs, desires and emotions) required for socialization. Parents reported that his play tended

to be focused only on his interests (e.g., cars or dinosaurs), although he did, at times, play appropriately with peers. The parents utilized several behavioral practices, including discipline methods, positive reinforcement, and visual supports. However, these were only effective in managing his behavior for short periods and were not useful in managing his behavior or helping him cope with his emotional dysregulation.

4.3. Procedure, Setting and Therapist

After the initial assessment provided evidence of significant behavioral difficulties, the Institutional Board of the Greek Association of Mental Health for Children and Adults approved the implementation of PCIT for this single case experimental study (Approval Number: 706/07-19). Informed written consent was obtained from the parent of the child for the publication of this case study. Treatment commenced after the parents completed baseline assessments that included information on child and parent functioning. Post-treatment data were gathered one week after the graduation session in which the caregiver met mastery criteria. Follow-up data were collected at 12 weeks post-treatment.

Sessions took place late on Friday afternoons, allowing Aris to attend weekly PCIT sessions without missing any school days. However, his father's work obligations hindered his PCIT participation. PCIT sessions were held in a play-therapy room connected to an observation room with a one-way mirror for coaching sessions; two video cameras were in the corner of the playroom. Toys used in this study were selected based on PCIT recommendations. During PDI, the observation room was used as a time-out room after removing any dangerous items. The cost of the sessions was covered by the family's health insurance plan and the clinic was close to Aris home, which was an important accommodating factor.

PCIT treatment was provided by the author, a doctoral-level researcher in child development and certified cognitive-behavior therapist with experience in PCIT. Co-therapists included two master students in psychology. Therapists were under the supervision of a certified PCIT therapist as needed. Weekly supervision meetings retained fidelity to this treatment. All treatment sessions were videotaped, chosen randomly for observing, and then coded by the therapists to ensure interrater reliability.

5. Instruments

5.1. Eyberg Child Behavior Inventory (ECBI; Eyberg & Pincus, 1999)

The ECBI is a 36-item comprehensive scale that uses parents' ratings of a child's behavior and includes two separate scores for "Intensity" and "Problem" scales. The reliability and validity of the scale for assessing the severity of problematic behaviors in children ages 2 - 16 have been established. The ECBI intensity scale

measures the frequency of behavior problems using a 7-point Likert-type scale (1 = never to 7 = always), while the problem scale measures how problematic the behavior is by using "yes" or "no" responses from the parent. Both scales have been found to be stable over time and sensitive to the intervention effects. In the current study, ECBI scores were combined using resolved T-scores, with a T-score > 60 considered as clinically significant.

5.2. Sutter-Eyberg Student Behavior Inventory-Revised (SESBI-R; Eyberg & Pincus, 1999)

The SESBI-R is a 38-item scale using teacher ratings to measure the intensity of various behaviors in children aged 2 - 16 years. SESBI-R is based on a 7-point Likert-type "Intensity" scale that assesses common behavioral problems, and a "Problem" scale on which the teacher indicates whether different behaviors are currently a problem using "yes" or "no" responses (0-1). A forward-backward translation process was used to translate the ECBI and the SESBI-R into Greek (Beaton, Bombardier, Guillemin, & Ferraz, 2000).

5.3. Achenbach Child Behavior Checklist/Caregiver-Teacher's Report Form (CBCL$1\frac{1}{2}$-5/C-TRF$1\frac{1}{2}$-5; Achenbach & Rescorla, 2002; Greek Version: Achenbach & Rescorla, 2009)

The CBCL$1\frac{1}{2}$-5/C-TRF$1\frac{1}{2}$-5 are parent/teacher rating scales measuring the severity of internalizing and externalizing behavior and emotional states in everyday situations across home and school in children aged 18 months to 5 years. Both forms require respondents to rate 100 items on a Likert-type scale (0 = not true, 1 = somewhat or sometimes true, 2 = very true or often). The scores are summarized into total behavioral problems, internalizing and externalizing problems, and syndrome scales, as well as into DSM-oriented scales with T-scores higher than 65 considered within the clinically significant range for all ages. Both CBCL$1\frac{1}{2}$-5/C-TRF$1\frac{1}{2}$-5 have well-documented psychometric properties.

5.4. Parenting Stress Index-Short Form (PSI-SF; Abidin, 1995)

The PSI-SF is a self-report measure of stress in the parent-child dyad designed for parents of children under 12 years. It comprises 36 items in three subscales: 1) parental distress (PSI-SD), 2) parent-child dysfunctional interaction (PSI-PCD-I), and 3) difficult child (PSI-DC). PSI-SF statements are rated on a 5-point Likert-type scale ranging from "strongly agree" to "strongly disagree"; a total stress score above 90 is clinically significant. The test-retest reliability coefficients for the total stress score ranged from .65 to .96. The PSI-SF total raw score was used at baseline and at post-treatment to assess the effects of PCIT on overall parenting stress. The PSI-SF was translated from English into Greek us-

ing the forward-backward translation method (Beaton et al., 2000).

6. Behavioral Observations

Dyadic Parent-Child Interaction Coding System (DPICS; Eyberg, Nelson, Duke, & Boggs, 2005)

The DPICS is a behavioral observation coding system created for use with PCIT in research and clinical settings;extensive psychometric data are included in the DPICS manual (Eyberg et al., 2005). DPICS assesses the quality of parent-child interactions during three 5-minute standardized play situations at the outset of each session using a video coding system. In this study, DPICS was used across all assessments and on both phases of PCIT (CDI and PDI) to measure changes in parent skill acquisition. Similar to previous PCIT studies (Agazzi et al., 2013; Budd et al., 2011), composites of "Do" skills (labeled praise, reflection, and behavior description), and "Don't" skills (questions, commands, and negative talk) were developed to teach desired parental behavior and behavior to be avoided during child-led play throughout PCIT. The DPICS was translated from English into Greek using the forward-backward process (Beaton et al., 2000).

7. Treatment

In keeping with the PCIT protocol (Eyberg & Funderburk, 1999), treatment involved of the two separate phases: CDI and PDI. Aris and his mother attended 19 weekly 1-hour sessions over approximately five months, which is close to the average length of treatment in studies examining PCIT for children with ASD and behavior disorders (Lienaman et al., 2017). Three of these sessions included initial behavioral observations, and CDI and PDI didactic sessions were held with the mother alone.

During the CDI teaching session, the parent learned how to allow Aris to lead during his special play time and to respond to his positive behavior by implementing positive parenting (Do) skills (labeled praise, description, and reflection). The parent was also taught to ignore minor inappropriate behaviors (e.g., crying or whining); for severe disruptive behaviors, the parent was instructed to immediately stop playing and do the same activity the next day.

The parent further learned how to avoid giving orders, asking questions, or using negative comments. The therapist coached the parent via Bluetooth technology through a one-way mirror, while listening to the dialogue between the parent and the child. Aris enjoyed playing with his mother; however, at CDI 4, he had difficulty engaging in play with his mother, indicating that the child's disruptive behavior had negative impact on the use of parenting skills by the caregiver.

The mothers' CDI skills were documented during the first five minutes of each session using the DPICS and her progress was supported via coaching until the caregiver had mastered these skills (see Figure 1 for the mothers' CDI

progress). At CDI 7, the mother reached mastery criteria—defined as 10 labeled praises, 10 behavioral descriptions, and 10 reflections—within the 5-minute observation period, which required the move to the next phase, PDI.

During PDI, the parent learned to implement effective discipline strategies. Specifically, throughout the PDI didactic session, the mother was coached on how to give developmentally appropriate direct commands and how to respect the time-out sequence, while the therapist encouraged the parent to practice this knowledge and receive the relevant feedback. In the next sessions, Aris was introduced to the time-out protocol through role-playing using a teddy bear, as recommended in the PCIT manual. In the first stages, the parent only used PDI during special play; however, as she gradually corrected and implemented the PDI skills, the parent broadened the range of these commands to various settings in the natural environment. PDI skills mastery was met when 75% of the caregiver commands were directly followed by labeled praises, dependent on the child's appropriate behavior to her demand.

Aris quickly learned to comply with the parent's effective commands and a structured time-out procedure was followed only on one occasion (PDI session 7; hitting mother and screaming). PDI was implemented at home during special playtime; then, the mother expanded PDI to cleanup following a special play, and eventually to Aris' regular routines (e.g., brushing teeth). The PCIT House Rules protocol was applied to reduce the child's disruptive actions. The parent selected a behavior to treat, and then taught the child the House Rules. In Aris' case, the rule was "no hitting" and any violation led to immediate time-out, which yielded significant results in reducing his aggressive behavior. **Figure 2** presents the changes in Aris' disruptive behaviors during PCIT, as reported by the parent on ECBI. By PDI 9, the mother met proficiency criteria and the PCIT ended, following Eyberg & Funderburk's (2011) graduation criteria.
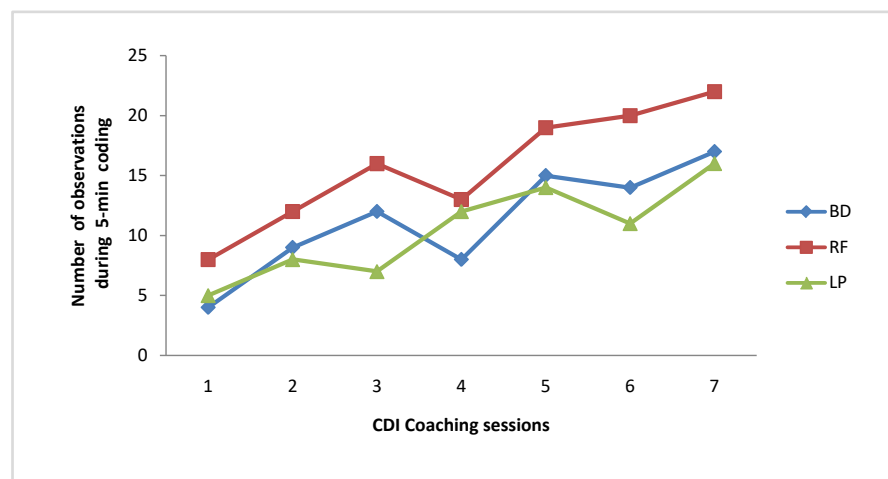
Figure 1. Mothers' progress of Do skills during CDI. Abbreviation: BD = Behavior Description; RF = Reflection; LP = Labeled Praise; CDI = Child-Directed Interactions.
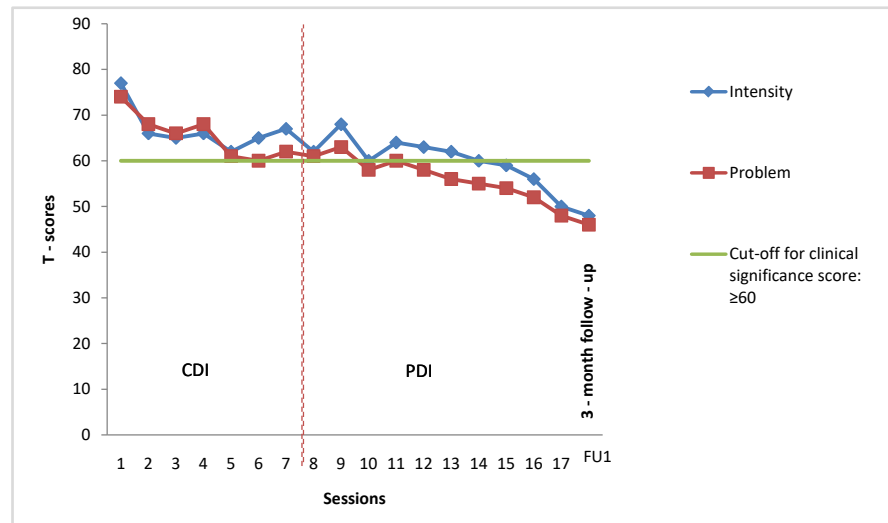
Figure 2. ECBI mothers' ratings over 16-PCIT sessions and during follow-up. Abbreviation: ECBI—Eyberg Child Behavior Inventory; CDI = Child-Directed Interaction; PDI = Parent Directed Interaction; FU = Follow-up.

8. Results

8.1. Baseline Data

The parent and teacher completed baseline measures of Aris' behavior functioning; clinically significant behavioral problems in various situations were recorded on both the Intensity and Problem scales on the ECBI and SESBBI-R (in each case, T-score > 60; Table 1). In addition, for the CBCL $1\frac{1}{2}$-5/C-TRF $1\frac{1}{2}$-5, both parent and teacher rated the child's behavior within the clinical range on the following DSM-oriented scales: Pervasive Developmental Disorder, Attention Deficit/Hyperactivity, and Oppositional Defiant Problems (in each case, T-score > 70; Table 1). Regarding maternal mental health, a total raw-score of 98 on the PSI-SF was reported by the mother, indicating clinically significant stress (Table 1). Additionally, maternal behaviors were coded during baseline DPICS situations; the parent's use of Do skills was limited, reflecting weakness in the parent-child interactions.

8.2. Intervention Outcomes

In terms of caregiver behavior, maternal use of 'Do' skills continued to improve at post-treatment DPICS observation, indicating gains in parent-child interaction (Figure 3). This resulted in improvements in parent and teacher-rated behavioral problems. As expected, the ECBI Intensity and Problem scales showed that scores were within the normal limits, indicating a marked decline on both the Intensity scale (T = 50) and Problem scale (T = 48; Table 1). Similar trends were observed across the SESBI-R scales (Table 1), where the teacher rating declined to within the normal range (T = 52 for Intensity and T = 50 for Problem). Further, findings confirming PCIT effectiveness was observed on CBCL$1\frac{1}{2}$

-5/C-TRF1$\frac{1}{2}$-5, which indicate a decrease in emotional and behavioral difficulties across most areas, compared with the baseline score. As shown in Table 1, at post-treatment, the CBCL1$\frac{1}{2}$-5 parent ratings were within the average range for Affective Problems (T = 56), Anxiety Problems (T = 57) and Oppositional Defiant Problems (T = 58); teacher ratings on the C-TRF1$\frac{1}{2}$-5 were reduced for Affective (T = 57) and Anxiety Problems (T = 54). A significant reduction was observed in the parent total stress score on the PSI-SF (raw score = 70; Figure 4), indicating significant improvement in maternal emotional state.

Table 1. Pre-post treatment and 3-month follow-up results.

Measurement Tools	Pre	Post	3-month follow-up
ECBI (T-scores, M = 50, SD = 10)			
Intensity	71	50	48
Problem	67	48	46
SESBI-R (T-scores, M = 50, SD = 10)			
Intensity	68	52	50
Problem	64	50	48
CBCL-DSM focused scales (T-scores, M = 50, SD = 10)			
Affective Problems	68	56	60
Anxiety Problems	67	57	55
Pervasive Developmental Problems	78	67	66
Attention Deficit/Hyperactivity	72	68	65
Oppositional Defiant Problems	74	58	57
C-TRF-DSM-focused scales (T-scores, M = 50, SD = 10)			
Affective Problems	69	57	56
Anxiety Problems	66	54	59
Pervasive Developmental Problems	75	73	69
Attention Deficit/Hyperactivity	71	67	66
Oppositional Defiant Problems	73	65	61
PSI-SF (Raw Score)			
Total Stress Score	98	70	69

Abbreviations: ECBI = Eyberg Child Behavior Inventory; SESBI-R = Sutter-Eyberg Student. Behavior Inventory Revised; CBCL = Child Behavior Checklist; DSM = Diagnostic and Statistical Manual of Mental Disorders; TRF = Teacher's Report Form; SPI-SF = Stress Parenting Inventory-Short Form; M = Mean; SD = Standard Deviation.
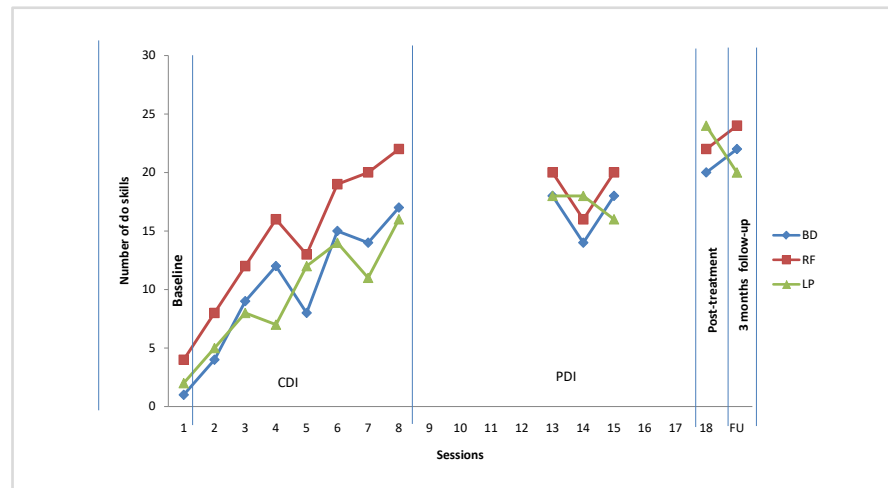
Figure 3. Child-lead Do skills across PCIT treatments. Abbreviation: CDI = Child Directed Interaction; PDI = Parent Directed Interaction; BD = Behavior Description; RF = Reflection; LP = Labeled Praise; FU = Follow-up.
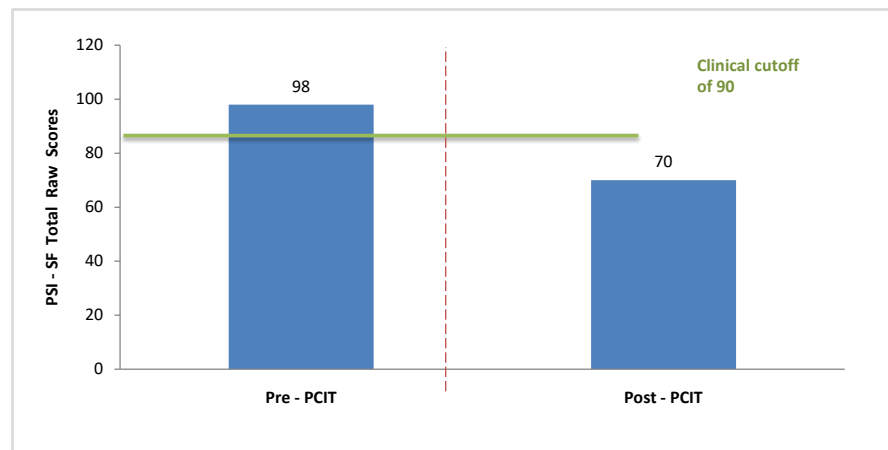
Figure 4. Mothers' changes in PSI-SF pre- and post-treatment. Abbreviation: PSI-SF = Parenting Stress Index-Short Form; PCIT = Parent-Child Interaction Therapy.

8.3. Follow-Up Outcomes

A 12-week follow-up was conducted with Aris' mother and his new teacher (see Table 1 for summary). The ECBI scores were still within the nonclinical range for both the Intensity (T = 48) and Problem scales (T = 46). The teacher report on the SESBI-R was within the normal range (Intensity: T = 50, and Problem: T = 48), which reflected the current perspective of the elementary school teacher, rather than his teacher during PCIT treatment. CBCL$1\frac{1}{2}$-5/C-TRF$1\frac{1}{2}$-5 scores declined steadily according to both raters; however, some symptoms in terms of Pervasive Developmental Disorders and Attention Deficit/Hyperactivity persisted in the clinical range (in each case, T-score > 65). Importantly, behavioral observations of the mother's parenting skills showed improvements at the 12-week follow-up, with the expectation of labeled praise (**Figure 3**).

9. Discussion

This study is the first of its kind from Greece that is written in English, describing the PCIT treatment for a child with ASD and a co-occurring behavioral problem, while bridging an evidence-based therapy to Eastern Europe. Furthermore, the participating clinic was the first to implement the intervention in Greece. To the best of the author's knowledge, there have been very few studies in Europe to examine the effects of PCIT; additionally, existing studies include mainly children without ASD (Bjørseth & Wichstrøm, 2016). This case study provides evidence that PCIT is effective in prompting several improvements in a child's behavioral functioning as well as in parent's skills. It is also indicates that PCIT reduces parental stress, as measured from baseline to post-treatment and maintained for a 3-month period. The case was a unique opportunity to test PCIT's developmental and behavioral-related benefits.

First, substantial changes in parenting skills were demonstrated during treatment by both observation measures and the self-reporting tool. As expected, a notable increase was observed during CDI; moreover, the skills of the caregiver continued to improve during PDI, and these skills remained proficient at the follow-up. Specifically, when the mother engaged with the child in a child-led play activity, she was able to learn and incorporate greater use of "Do skills," including labeled praise, behavioral description and reflection, and less use of commands and negative verbalizations. These findings are consistent with previous PCIT studies indicating that parent training interventions are effective in strengthening the parent-child relationship in families with ASD (Timmer, Ho, Urquiza, Zebell, Garcia, & Boys, 2011; Scattone, Sarver, & Cox, 2018).

From a developmental perspective, research has shown that children with ASD tend to show insecure and disorganized attachments and fewer contact seeking and maintaining behaviors with caregivers (McKenzie & Dallos, 2017; Teague, Gray, Tonge, & Newman, 2017); this negatively impacts parent-child communication and emotional connectedness (Thomas & Zimmer-Gembeck, 2007). Building warm and positive parent-child relationships—which is the focus in the CDI phase of PCIT—is critical for establishing attachments with caregivers (Bowlby, 1969) that allow children to build trust. In turn parents' responsiveness to the children's emotions and behaviors increases (Thomas & Zimmer-Gembeck, 2011). In this case, parental stress—as reported on the PSI-SF—was significantly reduced between pre- and post-treatment, demonstrating that the caregiver was less frustrated with the child. This finding is consistent with studies demonstrating PCIT's ability to reduce parental stress caused by dysfunctional parent-child relationships (Hosogane, Kodaira, Kihara, Saito, & Kamo, 2018; Timmer, Zebell, Culver, & Urquiza, 2010). Parent-training programs improve parental factors considering children with behavioral and emotional problems (Eyberg, Nelson, & Boggs, 2008), and hence, this study adds to the literature by showing that essential parenting mechanisms can be modified within ASD treatment.

Second, as it was expected, PCIT led to significant reductions in the child's disruptive behavior. This reflected improvement in his emotional regulation and behavioral functioning, as measured by the ECBI/SESBI-R and $CBCL1\frac{1}{2}$-5/C-$TRF1\frac{1}{2}$-5 at post-treatment and at follow-up. From a behavioral perspective, the outcomes of this study are consistent with PCIT research, showing its effectiveness in reducing behavioral problems in children with developmental disorders when complying with the core elements of treatment (Leasack et al., 2014; Solomon, Ozonoff, Carter, & Caplan, 2008; Bagner, & Eyeberg, 2007). The findings also show a moderate decrease in overall autistic behaviors measured by $CBCL1\frac{1}{2}$-5/C-$TRF1\frac{1}{2}$-5 across assessments. For instance, scores decreased for the Pervasive Development Disorder DSM-oriented scale but remained generally above the clinically relevant range.

Although PCIT focuses on increasing the child's adaptive behavior and improving communication, it does not benefit all core autistic behaviors. Therefore, decreases in the PPD scale assessed by both teacher and parent could be explained by the fact that treatment-improved behaviors related to connectedness may have been influenced by the child's increased emotional regulation. This case study obtained similar findings to those observed in Armstrong & Kimonis, (2013) and Agazzi et al. (2013). These case studies also employed PCIT for families with children with ASD, and indicated behavioral improvements close to those of children without ASD who received PCIT (Ware, McNeil, Masse, & Stevens, 2008).

10. Limitation and Future Research

This case study contributes to the relevant literature by presenting evidence supporting the effectiveness of PCIT in a different cultural group from which the original intervention was tested; however, some limitations must be addressed. The most important limitation is the single case research method. The findings of this case study—although important for clinical practice—are limited in their generalizability and durability within this population across various contexts. Future research should include longitudinal data to examine the long-term effect of parent behavior training on families with children with ASD using a larger sample from different countries.

Second, a longer follow-up duration with additional evaluation criteria would provide a more realistic representation of the treatment's long-term results. Third, behavioral assessments were all parent and teacher reports and were limited to the ECBI/SESBI-R and the $CBCL1\frac{1}{2}$-5/C-$TRF1\frac{1}{2}$-5. This may limit the range of interpretations that can be drawn from this work to those related to parent and teacher views. Standardized tools (in addition to those used in this study) should be included in further studies assessing the PCIT effect on a

broader range of symptoms, including social functioning, communication, and pretend play (Bjørseth & Wichstrøm, 2016).

Finally, future studies should investigate whether PCIT can serve as a primary treatment that improves the parent-child relationship and increases children's adaptive behaviors, paving the way for greater life success (e.g., social connectedness, engagement in community, and academic achievement) and success in supportive interventions (e.g., speech therapy and occupational therapy; Masse et al., 2016).

11. Clinical Implications

This case study's results have several clinical implications. The evidence from the current study suggests that visualizing and sharing weekly graphic reports of ECBI and DPICS data were useful in helping the caregiver improve her CDI skills and encouraging her efforts. In clinical practice, this method is strongly recommended in order to enhance parents' awareness of ways to foster their relationship with their child, resulting in an increased level of positive affect in their interaction. Additionally, practitioners may find it useful to engage school staff in the treatment strategies by introducing consultations with the teachers; this would ensure that the child receives consistent messages across settings regarding appropriate and inappropriate behaviors.

Furthermore, formal training in Teacher-Child Interaction Therapy (McIntosh, Rizza, & Bliss, 2000) using PCIT techniques may help reduce aggressive behaviors and increase student compliance. In the present study, the preschool teacher contributed to this effort by creating a reinforcement system that allowed Aris to earn privileges at the end of the week based on his daily behavior in school. Further, therapists utilizing this approach will find that using additional assessment methods—such as functional assessments—prior to treatment could help in identifying individuals' social reinforcers. This may be useful for gauging the child's social behaviors in different settings (Armstrong & Kimonis, 2013).

Although research has documented clinical PCIT progress within the autism spectrum, it is worth noting that it may not be helpful for children with ASD and intellectual disabilities, including children who do not understand basic instructions. Indeed, clinicians must include an initial formal assessment of children's cognitive abilities, as a child's individual developmental level is an important element influencing PCIT success. In such cases, PCIT may require additional adaptations to meet children's needs. Although parents from Greece who raise children on the autism spectrum are not familiar with the use of strict behavior-based methods such as "time-out"; this study helped the caregiver to realize that the implementation of these techniques had a positive impact on the child's behavior. Lastly, the transferability of PCIT in real-world therapy settings might be critical for both research and clinical practice (Abrahamse, Junger, van Wouwe, Boer, & Lindauer, 2016) and policymakers should consider how to

make PCIT training more accessible to community mental health providers to implement empirical-based treatments for children with ASD and their families.

12. Conclusion

From the development and behavioral points of view, this case study provides useful preliminary evidence supporting the effectiveness of PCIT in treating a child's disruptive behavior, improving the parent-child relationship, and reducing parental stress by using positive parenting skills. In turn, the child's socio-emotional areas of development—including emotional self-regulation and socialization—were improved. These changes in the child's behavior and parental mental health increased opportunities to improve their wellbeing and to cope with the frustrations of daily life.

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Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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