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Parent-Child Interaction Therapy for Children with Autism

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PARENT–CHILD INTERACTION THERAPY FOR CHILDREN WITH AUTISM

by

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Autism spectrum disorder (ASD) is a pervasive lifelong developmental delay with a prevalence of 1 in 68 children. This growing epidemic occurs for unspecified causes and researchers continue to explore evidence-based treatments available. Parent–child interaction therapy (PCIT) is a parent training program, initially developed for implementation with typically-developing children. PCIT has shown effectiveness in increasing child compliance, minimizing disruptive problem, improving parent-child relationship satisfaction, and communication. The present study investigated the efficacy of PCIT as an evidence-based practice (EBP) for children with ASD by implementing a non-concurrent multiple baseline design across three participants. Results indicated socially significant increases in child compliance, decreases in aberrant behavior, rapid acquisition and maintenance of acquired parenting skills, as well as improved parent-child relationship satisfaction. This study aimed to replicate previous research measuring the effectiveness of PCIT with children with ASD.

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CHAPTER 1

INTRODUCTION

Autism spectrum disorder (ASD), a lifelong pervasive condition, is a developmental disability beginning in early childhood that is characteristic of significant social, communication and behavioral challenges (Centers for Disease Control & Prevention, 2016). Individuals with ASD are often characterized by a lack of social interaction, behavioral inflexibility, and impaired or restricted communication, often on a wide continuum of severity (Wing & Gould, 1979; DeMyer et al., 1973). There is currently no known cure or cause for autism despite the significant number of studies conducted to determine a specific cause. Researchers continue to debate whether causes of autism can be attributed to a multitude of genetic and/or environmental factors (Baron-Cohen, 2004; Herbert, 2010). Historically, ASD was considered an extremely rare condition that was not researched or documented in the literature until the 1940s (Kanner, 1943). Several decades have passed since ASD was first recognized, while prevalence of this condition has only continued to climb at an exponential rate. According to the CDC (2016), the prevalence of ASD has significantly increased from one in 150 to one in 68 children over the past decade, but, it is debated if the increase is due to a rising population of individuals with autism, or a result of a widened definition of the condition (Neggars, 2014; Rice et al., 2012).

ASD is a condition that effects the "development in social interaction, communication, and a markedly restricted repertoire of activity and interests" (American Psychiatric Association, 2007, p. 70). Families caring for a family member with autism places great strain and hardship upon relationships, finances, and mental health (Buescher et al., 2014; Lavelle et al., 2014; & Pollard et al., 2013). In a study conducted by Langley, Totsika, and Hastings (2017), they found depression in parents of children with autism is significantly correlated with the behavior

problems of the child with ASD. Pollard et al. examined typically developing children who have a sibling diagnosed with ASD and a history of problem behavior. The study found a positive correlation between anxiety in the typically developing sibling and problem behavior with the child with ASD, resulting in reported poor relationship quality between siblings. In addition, the economic burden associated with ASD is substantial and can be measured across multiple aspects of our society as well as the family unit. Parents with children with ASD repot higher numbers of doctor visits, prescription drug use, special education services, which amount to more than $17,000 additional costs per year (Lavelle et al., 2014; Leigh & Du, 2015).

As the population of individuals with autism increases, the need and demand to serve this population subsequently increases. Unfortunately for caregivers and healthcare providers, the market for autism treatment is inundated with therapies with little supporting evidence of effectiveness in treating ASD. The recent popularity of complementary and alternative medicine (CAM) have given rise to many therapies, treatments, or practices that is believed by the user to prevent or treat illness. Specifically regarding ASD, Brondino et al. (2015) describe CAM therapies as dietary interventions, vitamin and herbal remedies, chelation, oxygen therapy, music therapy, drama therapy, dance therapy, acupuncture, auditory and sensory integration therapy, pet therapy, yoga, and chiropractic care. Upon further investigation of various studies regarding CAM therapies, Brondino et al. reported “no conclusive evidence supporting the efficacy of CAM therapies in ASD” (p. 26). Overall, 88% of parents reported on use of CAM in the past and 47% used CAM within the last six months, which is an indication that providers must advise caregivers on the advantages and disadvantages of various CAM therapies to guide and support treatment decisions (Salomone et al., 2015; Owens-Smith et al., 2015).

The term ‘evidenced-based practice’ (EBP) has become a popular phrase within the literature in the last decade, although the meaning of the term may outline differing objectives defined by the philosophies and set of principles within a given profession, institution, or individual. The American Psychological Association (APA) (2006) defines EBP as “the integration of the best available research with clinical expertise in the context of patient characteristics, culture, and preferences” (p 273). In an effort to unify the understanding of EBP, the APA developed guidelines to encourage consistency of sound practice and treatment. Within the scope of ASD, EBP during early intervention often leads to adults who are likely to lead a more independent life (Sallows & Graupner, 2005). Use of effective EBPs may help to minimize the societal impact of individuals with autism to ensure that time, effort, and financial expenses are being maximized (Chasson, Harris, & Neely, 2007; Reichow, Doehring, Cicchetti, & Volkmar, 2011). For families and caregivers, choosing a treatment that is evidenced-based is of utmost importance for an individual who may be unable to consent for themselves.

One of the most effective evidence-based treatments for ASD includes early intensive behavioral intervention (EIBI), which is an intensive one-on-one behavioral treatment addressing the delays and deficits characteristic of ASD (Lovaas, 1987; McEachin et al., 1993; Reichow, 2012; Sallows & Graupner, 2005; Slocum et al., 2014). EIBI is a comprehensive treatment derived from the principles of applied behavior analysis (ABA), and comprises integration of the best available evidence, client values, context, and clinical expertise (Slocum et al., 2014). The EIBI model focuses on discrete-trial teaching, which targets teaching skills in a repetitive and concise fashion while minimizing irrelevant variables (Lovaas, 1987). EIBI is often implemented with children starting at around 3-years-old for up to 40 hours per week, in order to target fundamental skills such as receptive instructions, imitation, or socialization. Several studies have

found that 50% of children with ASD show significant gains and outcomes to comprehensive early intensive behavioral interventions (Lovaas, 1987; McEachin, Smith, & Lovaas, 1993; Sallows & Graupner, 2005). The greatest strength and foundation of the behavioral approach is that it is scientific, with measurable outcomes. Measurable change allows the clinician or researcher to determine if an intervention is effective at changing a targeted behavior, which is key for a treatment that is evidence-based.

As the demand for evidenced-based treatments for children with ASD continues to increase, researchers continue to seek interventions that are socially significant and empirically supported. Eyberg & Child Study Lab (1999) developed Parent–Child Interaction Therapy (PCIT) as a parent–training intervention for treatment of problem behaviors in typically developing young children aged two to seven years old. PCIT occurs in two phases, the first phase focusing on building the parent-child relationship, while the second phase integrates consistent discipline for problem behavior. In a comparison study by Bjorseth & Wichstrom (2016), children receiving PCIT demonstrated "a greater reduction in behavior problems compared with children receiving therapy as usual (TAU), and their parents' parenting skills improved to a greater degree compared with those receiving TAU" (p. 12). Parents acquire a skill set that allows them to positively interact with their child and follow through with consequences for noncompliance and problem behavior.

PCIT strategies aim to create a positive parent-child dynamic, decrease problem behavior and increase compliance, which may lead to greater relationship satisfaction in families with children diagnosed with various conditions. Evidence supporting the effectiveness of PCIT has been shown in young children exhibiting problem behaviors in addition to a history of language impairment (Allen & Marshall, 2011), sexual abuse (Allen, Timmer, & Urquiza, 2016), or

ADHD (Matos, Bauermeister, Bernal, 2009), among many other conditions. As the population of children with ASD continues to rise, treatments that are cost-effective, evidenced-based, and maintainable continue to push researchers to search for alternative solutions. PCIT has been shown to be an effective intervention for children with ASD for increasing compliance, improving parent-child relationship satisfaction, and reduction in problem behaviors (e.g., Agazzi, Tan, & Tan, 2013; Ginn, Clionsky, & Eyberg, 2017; Lesack, Bearss, & Celano, 2014; Masse, McNeil, Wagner, Quetsch, 2016). There is much to be studied as the body of literature reviewing the efficacy of PCIT single-case design with individuals with ASD has only begun to be analyzed in the past decade.

Agazzi et al. (2013), Lesack et al. (2014), and Masse et al. (2016) evaluated the effects of varying adaptations of PCIT for young children diagnosed with ASD. Referral to PCIT was based upon significant problem behavior such as tantrums, noncompliance, aggressive behavior, dangerous and destructive behavior, lack of attention/focus, and self-injury. Both phases of PCIT were implemented within a clinical setting utilizing two-way mirrors and feedback microphones. The PCIT intervention was successfully implemented as determined by parent report of increased child compliance, reduction in problematic behavior, maintenance of acquired PCIT skills, positive child-directed interactions outside of sessions, and fewer opportunities to engage in disruptive or self-stimulatory behaviors. Parents participated in daily homework, which consisted of implementation of their own PCIT sessions allowing for the opportunity to practice skills gained from the intervention.

Previous studies of PCIT typically implemented procedures within a laboratory setting and used technology that is often unavailable in the applied setting (i.e., ear pieces for feedback, two-way mirrors, etc). As research for PCIT seems limited to typical clinical and laboratory

settings, the objectives of the present study target incorporating the procedures and principles of the intervention within the context of in-home services for children with ASD. The current study aims to contribute successful implementation of PCIT within an environment that is not reflected in the literature. The purpose of the study is to replicate the impact of PCIT using a non-concurrent multiple-baseline design across participants with ASD within the context of in-home ABA therapy.

CHAPTER 2

METHOD

Participants & Settings

All participants were diagnosed with ASD by a medical doctor and participated in the intervention at the recommendation of the supervising behavior analyst. Each participant had received in-home applied behavior analysis (ABA) services for at least 18 months. The PCIT intervention was conducted at least once per day for 10 minutes in length, 6 days per week. Sessions occurred within the home of each participant, and in various locations throughout the participant's home (therapy room, living room, basement, etc). Parent, child, & therapist were present for each PCIT session, which occurred during a portion of the participant's regularly scheduled ABA therapy sessions.

Mario. Mario was a 4-year-old male, who resided in an urban setting with his parents, younger sister, and grandmother. He did not attend school, received 37 hours of ABA therapy per week, and he was trilingual in English, Finnish, & Spanish. The severity of Mario's ASD required him to need substantial parent support for daily living activities (toileting, dressing, etc). He was referred to PCIT based on parent report of consistent noncompliance, dangerous behavior (climbing on counters), and repetitive behavior (slamming doors). The intervention was first conducted in his therapy room (bedroom) and relocated to living room during the second phase. Activities utilized included Mr. Potato Head, tag, peek-a-boo, action figures, blocks, cars, tickling, books, animal figures, farm house playset, and puzzles.

Zane. Zane was a 5-year-old male, who resided in a suburban setting with his parents; he was an only child. He attended a full day of kindergarten, received 17 hours of ABA therapy per

week, and he was bilingual in English & Urdu. The severity of Zane's ASD required him to be placed in a special needs school environment, as well as parent support for daily living activities (feeding, dressing, etc). He was referred to PCIT based on high rates of disruptive behaviors including hitting, throwing, tantrums, swiping materials, urinating during time outs, and inflexibility of his environment. The intervention was conducted in his therapy room (bedroom). Activities utilized included puzzles, 3D mazes, writing on whiteboard, playdoh, playing catch with a ball, trucks, penguin race, Doodle Pro, blocks, giant toy piano, light spinner, tops, and balloons.

Jacob. Jacob was a 7-year-old male, who resided in a suburban setting with his parents; he was an only child. He attended a full day of second grade, received 23 hours of ABA therapy per week. The severity of Jacob's ASD required him to be placed in a special needs school environment, as well as parent support for daily living activities (feeding, dressing, toileting). He was referred to PCIT based on parent reports of inability to interact with their child due to stereotypic behaviors and lack of interest in others. The intervention was first conducted in his living room, then relocated to bedroom and therapy room (basement). Activities utilized included soccer ball and goal, bowling, light-up toys, police station play set, fire station play set, school house play set, letter puzzle, number puzzle, and Simon says game.

Dependent Measures

Three separate measures were used throughout the current study to examine behavior of the parent and child. The pre/post PCIT measure reported appropriate behavior and inappropriate behavior of the participant/child using a frequency count. Appropriate behaviors included sitting with parent, walking up to parent, engaging in eye contact and labeling, bringing activity/object to parent, accepting activity/object from parent, or grabbing caregivers hand. Inappropriate

behaviors included hitting, throwing, whining, screaming, property destruction, crying, or blocking parent.

During the child-directed interaction (CDI) phase of PCIT, the second measure incorporated the dyadic parent-child interaction coding system (DPICS) provided within the PCIT manual (Eyberg, 1999, p. 36), which implemented a coding method for recording positive and negative verbal responses of the parent. Frequency counts were recorded for positive verbal responses including behavior description (statements about the child's actions), reflection (emitting verbalizations that reflect the verbal responses of the child), and labeled praise (specific statements telling the child they are doing well). Frequency counts were also collected for negative verbal responses including questions, commands, and negative talk (verbalizations expressing disapproval). Parents met mastery criteria for use of acquired CDI skills with a score of 30 positive verbal interactions (i.e. 10 instances each of behavior description, labeled praise, and reflection) and zero negative interactions (i.e. negative talk, questions, commands) for five consecutive sessions. During the parent-directed interaction (PDI) phase (second phase of PCIT), child compliance to parental commands and parent implementation of the time-out procedure for non-compliance was recorded as well (Eyberg, 1999, p.115).

Inter-observer agreement was calculated by summing total agreements on the occurrence of positive and negative interactions divided by total agreements and disagreements and multiplied by 100%. Two therapists independently coded PCIT sessions. One therapist coded in vivo, while a second therapist coded via video recordings for 35% of sessions. Sessions coded by two therapists were distributed through all phases of the study; CDI (14 sessions), PDI (12 sessions), and pre/post assessment (10 sessions). The average percent agreement between therapists was 93%, with a range of 89% to 100%.

Sessions were conducted by Registered Behavioral Technicians (RBT) working as co-therapists who were overseen by a supervising clinician. Therapist fidelity was assessed by team managers prior to the start of the intervention via role-play scenarios. Two therapists role-played a typical PCIT session while co-therapists utilized the DPICS to give feedback to the participants in the mock session. The DPICS sheets were compared to data simultaneously collected from the team manager and supervising behavior analyst for accuracy. Therapists were rated for integrity during four consecutive mock PCIT sessions. Accuracy with treatment protocol ranged from 87% to 100%.

Procedure

A non-concurrent multiple baseline design was used across participants to measure the effect of PCIT on the frequency of positive and negative parent-child interactions.

Pre/Post PCIT Phase. During pre- and post-training sessions, the parent and therapist setup 'special time' at a previously determined location within the home parallel to the format of a PCIT session. During both phases, the parent and child interacted without any feedback from the therapist. The therapist observed and gathered frequency data of appropriate and inappropriate child-directed interactions with the parent.

Training. Prior to the start of the intervention, the parent and supervising clinician discussed all procedures and expectations outlined in the PCIT manual. During this training session, parents were informed of the specific behaviors they were expected to increase and decrease, and the protocol for their child's appropriate and maladaptive behavior. In an effort to provide opportunities for parents to practice appropriate interaction with their child, parents were encouraged to implement their own PCIT sessions outside of regular sessions at least five times per week. Parents were provided with a hard copy PCIT manual for their review.

CDI Phase. Parent and therapist setup PCIT sessions with appropriate toys and activities discussed prior to the session (toys and activities chosen must encourage social interaction). The parent led the child to the predetermined location within the home and stated “It’s special time”, at which point the observing therapist set a timer for a duration of ten minutes. During the session, the parent allowed the child to completely direct what activities or toys they played with while the parent used the specified positive verbal responses to describe behavior of the child and delivered specific praise for appropriate behavior. While the parent and child were interacting, the therapist recorded frequency of positive and negative verbal responses and provided the parent with concise, immediate feedback on how they interacted with their child. PCIT sessions ended immediately following any destructive behavior (hitting, throwing, tantrums, etc). Once mastery criteria was met by the parent, the determining factor to move onto the second phase included the degree ‘special time’ had become reinforcing to the child, which was determined by the supervising behavior analyst. Behavior such as independently requesting for ‘special time’, the child’s emotional magnitude when ‘special time’ concluded, and the number of positive child-led interactions during sessions were taken into account when deciding to move onto the next phase.

PDI Phase. This second phase resembled the CDI phase, except the parent gave direct and specific commands to their child during the session (e.g., “Stand up”, “Give me ball”, “Close door”, “Build train”, etc). The specific commands used during session were predetermined by clinician and parent. Commands were chosen based on requests the child was likely to comply with and increased in difficulty as the phase progressed. If the child complied with the command, they were reinforced with labeled praise, attention from parent, and occasionally a highly preferred edible. Depending on the progression of the interactions, parents gave several

commands during the length of a session. If the child did not comply with a command, a time-out procedure was implemented by the parent. The procedure consisted of a hierarchy of procedures for compliance, which included the parent giving a warning for compliance, directing the child to a time-out chair, or directing the child to a time-out room for an arbitrary length of time. The time-out duration is arbitrary since the child was required to remain seated, calm, & quiet for at least 15 seconds before dismissal from time-out area. PCIT sessions ended immediately following any destructive or aggressive behavior (e.g., hitting, throwing, coloring on wall, breaking objects, etc). Mastery level for child compliance was set at five consecutive sessions at 100% compliance from child. Meeting mastery criteria determined the next level of difficulty of commands the child was expected to comply with. Once a participant/child was proficient in complying with multiple commands requiring significant attention and effort, the supervising behavior analyst considered discharge from the intervention.

CHAPTER 3

RESULTS

Figure 1 depicts overall results, which indicate that positive child-led interactions increased and negative child-led interactions decreased across all three participants. Each participant (child) improved appropriate behaviors and reduced the number of inappropriate behaviors toward their parent. During baseline phase, participants exhibited a low frequency of appropriate child-led interactions with a parent and a high frequency of inappropriate interactions with a parent. On average, participants maintained 6.75 appropriate behaviors and 7.26 inappropriate behaviors during baseline. Following the intervention, post-test data show substantial results of high frequency of appropriate behaviors, while inappropriate behaviors were almost completely extinguished. On average, participants maintained 19.86 appropriate behaviors and 0.28 inappropriate behaviors following the intervention phase.

Figure 2 depicts overall increased appropriate behaviors and decreased inappropriate behaviors across all three participants. Parents rapidly decreased the number of inappropriate behaviors used during parent-child interactions and maintained low levels of questions, commands, or general negative talk once the intervention was implemented. Appropriate parent behavior steadily increased during sessions and continued to progress throughout the duration of the intervention, even through the second phase of the intervention (PDI) which focused on training for behavioral compliance. On average, participants increased use of acquired CDI skills by 25.1 appropriate behaviors and decreased their use of inappropriate behaviors by 10.1. As parents increased their use of positive behaviors and decreased their use of negative behaviors their children also increased their own use of positive behaviors and decreased their use of negative behaviors with a parent by the conclusion of the study.

In addition, Figure 3 depicts overall increased child compliance during the PDI phase of the intervention, which coincided with increased appropriate parent behaviors and decreased inappropriate parent behaviors. As parental appropriate behaviors increased, the probability of child compliance and appropriate behaviors toward parents also increased. Results indicated child participants complied with parental demands for 25.7% of the opportunities presented during the first ten sessions of the PDI phase, and complied with parental demands for 100% of presented opportunities during the last ten sessions of the PDI phase.

CHAPTER 4

DISCUSSION

As the number of children with ASD increases (Centers for Disease Control and Prevention, 2016), researchers and parents seek to find effective strategies to combat noncompliance and manage problem behavior. PCIT has been proven to be an effective and evidence-based treatment developed for young children exhibiting maladaptive behavior (Eyberg et al., 2008; Bjorseth & Wichstrom, 2016; Ginn, Clionsky, & Eyberg, 2017). The current study utilized PCIT procedures in an effort to replicate the impact of PCIT within an ABA setting to address problematic behavior that is often characteristic of ASD. Results of the study confirmed increased appropriate parent behaviors and compliance, while also reducing inappropriate parent behaviors and disruptive child behavior across all three participants. As a result of the PCIT strategies used, a positive parent-child dynamic emerged, which led to greater relationship satisfaction in families with children with ASD.

Research shows limited evidence that PCIT with modifications is valuable, which is further limited within the context of the in-home applied setting for children with ASD. To date there have been few experimental studies incorporating PCIT and in-home ABA therapy. Lesack, Bearss, and Celano, (2014) successfully implemented an adapted version of PCIT using ABA procedures with young children with ASD, although implemented in a structured clinical setting. The current study analyzed a systematic replication of the modified PCIT protocol in which sessions were conducted in-home with a duration of ten minutes for five to six days per week over a period of five months.

A satisfaction survey completed after the intervention reported that parents averaged a 25 out of 25 in satisfaction scoring. Parents determined the methods of PCIT to be acceptable, and

stated the intervention was worthwhile in modifying their child's behavior and improved parent-child relationships. Parents also reported they would continue to implement PCIT skills acquired after the completion of intervention and would recommend the training to other parents. Zane's parent reported positive child interactions maintained across implementers (mom coached family members to implement PCIT), and generalization across various environments (grandma's house, living room, backyard, etc). Zane and Jacob began independently requesting 'special time' with parent outside of sessions after approximately 30 PCIT sessions.

Although the use of non-concurrent multiple baseline design (MBD) controls for threats to internal validity such as maturation, test-retest sensitivity, and instrumentation changes (Watson & Workman, 1981), this type of experimental design is not without limitations. First, the main limitation with non-concurrent MBD is the inability to distinguish history effects that may coincide with implementation of a specified intervention (Christ, 2007). For example, one participant in particular attends school in which educators and administrators implemented multiple interventions in an attempt to extinguish maladaptive behavior exhibited in the classroom and increase compliance. With the design selected, the interference of one of those interventions cannot be ruled out. In addition, the limited number of participants characteristic of single-case designs should be acknowledged as a potential limitation. Another possible limitation includes the lack of measurement in the quality of the interactions between parent and child during intervention. Although the present study measured the frequency of desired behaviors, it does not account for the substance of the interactions which can be observed as a result of the intervention.

The results of the current study have important clinical implications for those working with individuals diagnosed with ASD and their families. First, PCIT delivered to parents with

children with ASD enriched parents' understanding of how their relationship with their child also could act as an effective reinforcer for appropriate behavior. Second, parents became aware that they are in control of the contingencies to which their child responds to. Most importantly, results suggest a clinical or laboratory setting is not the only environment in which PCIT may be effective. In fact, implementing PCIT within the confines of a home environment eliminates the need to generalize results in a setting acquired skills will be applied.

Efforts to adapt PCIT for children with ASD are still at an early stage in the literature, and future research may consider adapting PCIT procedures to settings outside of clinical environments. As clinicians and families effected by ASD continue to search for evidence-based treatments, it is important the chosen therapies are adaptable to various clinical settings as well as individualized treatment for the participant. Given the flexibility of PCIT, the opportunity to explore various circumstances outside of the clinical setting in which the intervention may be implemented should be further researched. Results from this study should encourage continued research on PCIT intervention in the home environment, including a more thorough systematic evaluation within this context. In addition, increased positive social interaction and measurement of the quality of the interactions is largely not addressed in the literature and should be considered for future studies. Comparisons of various types of parent trainings and PCIT should also be further researched in order to establish confidence the most effective and evidenced-based parent training is implemented within the applied setting.

This study provides further evidence for the effectiveness of PCIT in treating young children with ASD, by demonstrating an increase in positive parent behaviors, parent-child relationship satisfaction, and compliance, while also reducing negative parent behaviors and maladaptive child behaviors. The current study shares unique PCIT adaptations that contributed

to the successful implementation of the intervention within the context of in-home ABA therapy. Economically, the PCIT adaptations utilized in this study have sustained a cost-effective way to implement parent training during regularly scheduled in-home ABA therapy, at no additional cost to the participant. Further research on PCIT is necessary in order to advance our understanding of the best approaches to address maladaptive behaviors, noncompliance, and lack of social interaction associated with ASD.

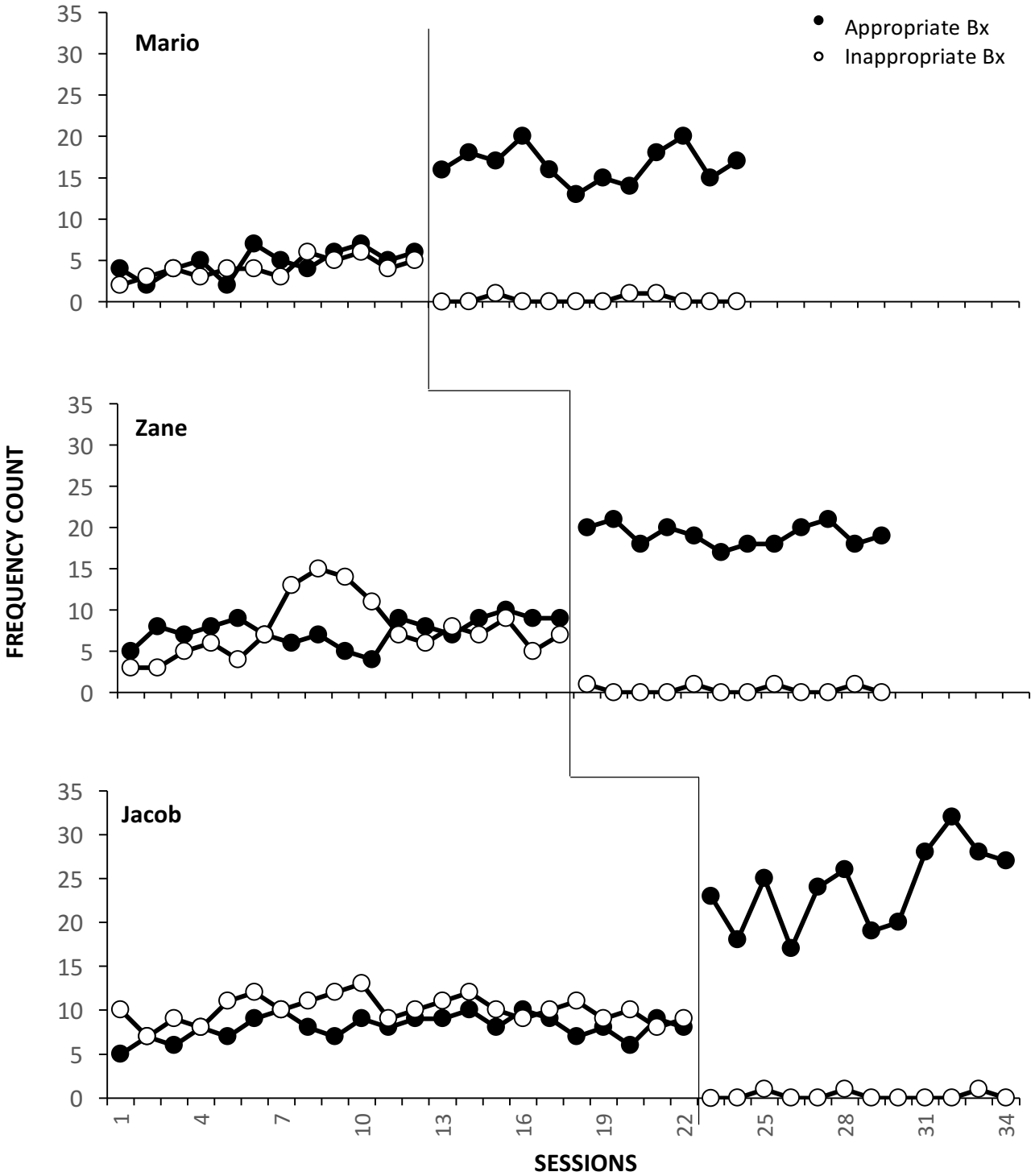

Figure 1. Pre-test & post-test results indicate a consistent increase in child-directed positive interactions and decrease in child-directed negative interactions with a parent across all participants.

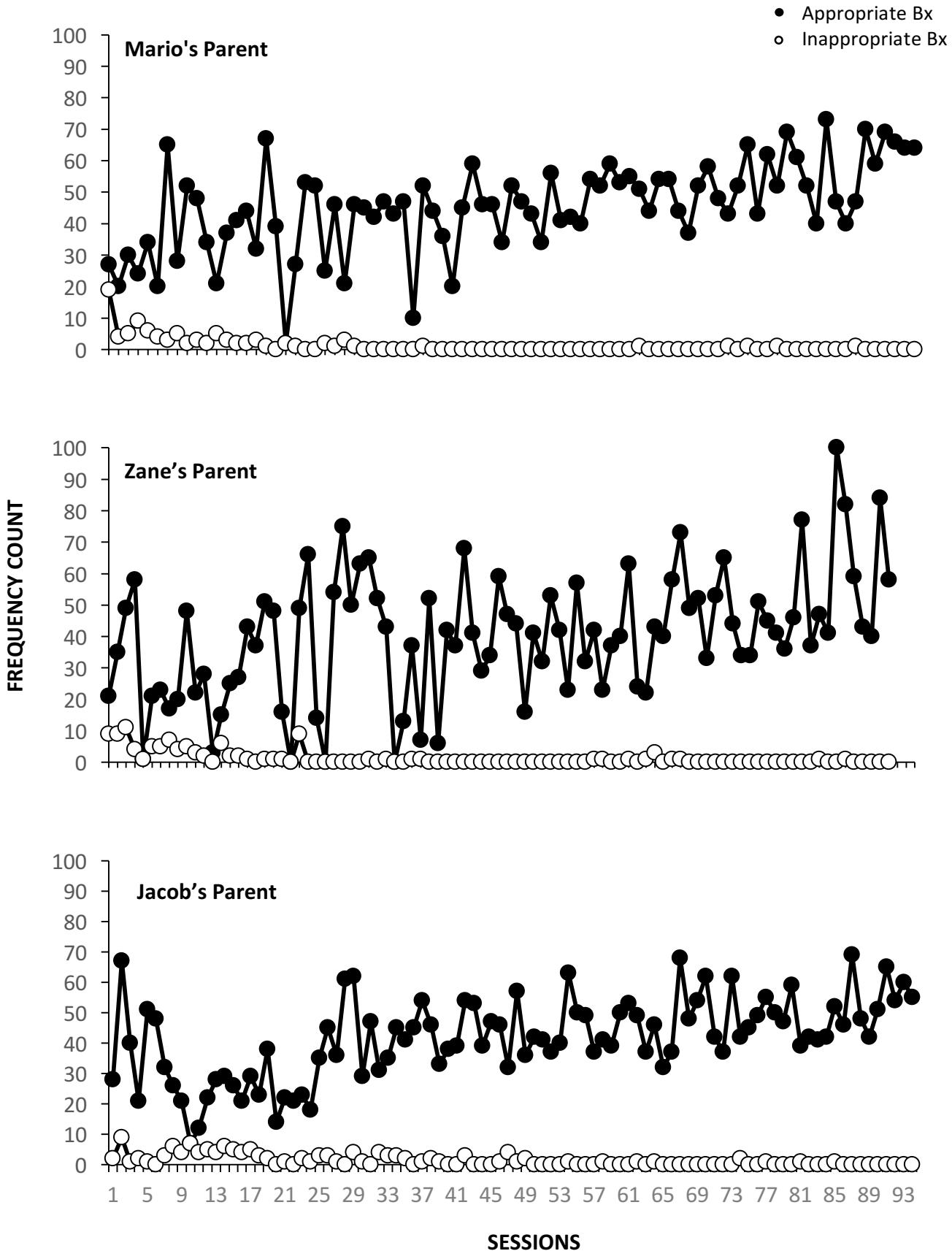
Appropriate Bx
Inappropriate Bx
Mario's Parent
Zane's Parent
Jacob's Parent
FREQUENCY COUNT
SESSIONS
0
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Figure 2. PCIT intervention for parents indicate a consistent increase in positive interactions and decrease in negative interactions with their child with ASD across all participants

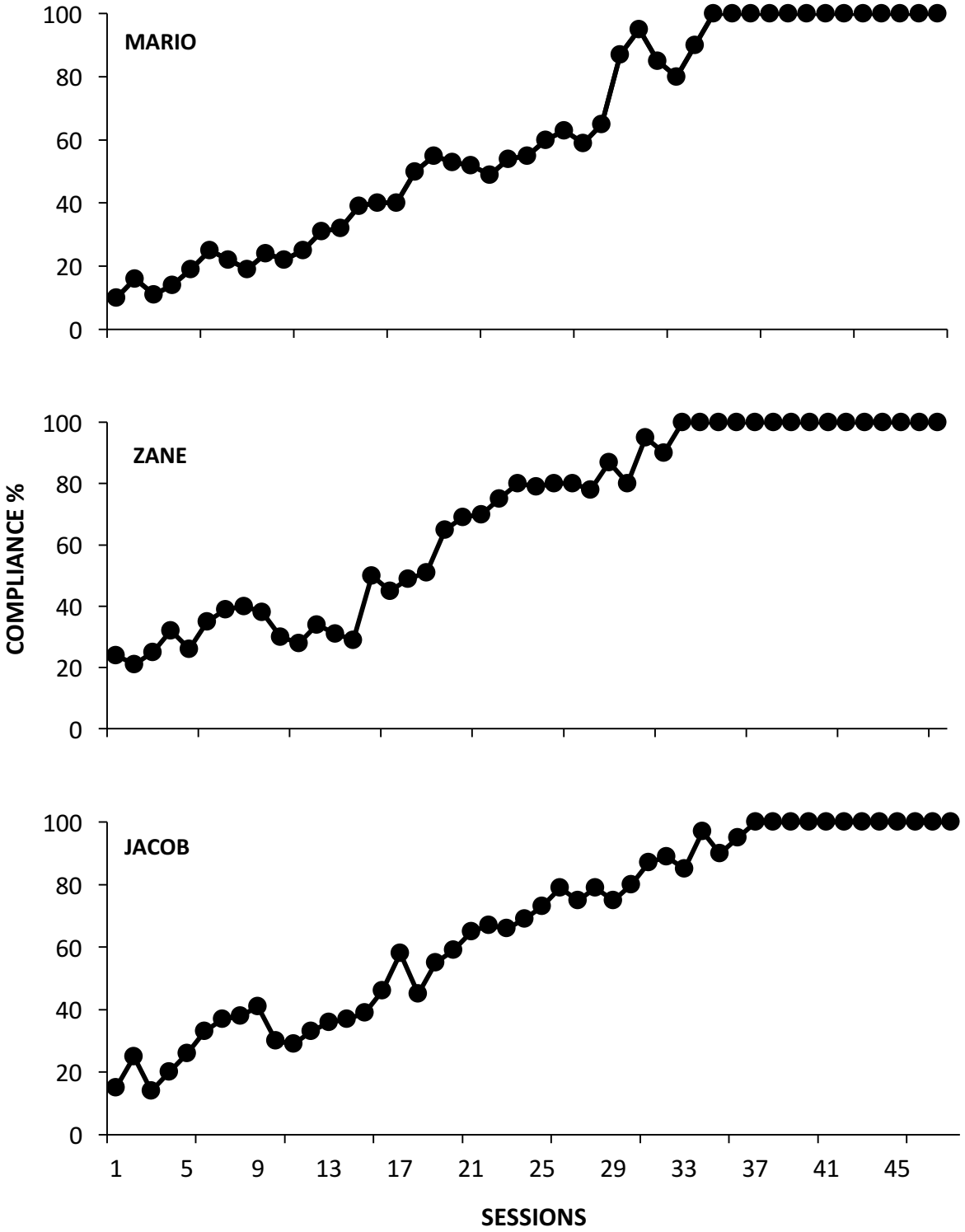

Figure 3. Results show a consistent increase in child compliance of parental demands across all participants throughout the duration of the PDI phase of the intervention.

REFERENCES

Agazzi, H., Tan, R., Tan, S. Y., (2013). A Case Study of Parent-Child Interaction Therapy for the Treatment of Autism Spectrum Disorder. *Clinical Case Studies, 12(6),* 428-442. DOI: 10.1177/1534650113500067.

Allen, B., Timmer, S. G., & Urquiza, A. J. (2016). Parent-Child Interaction Therapy for sexual concerns of maltreated children: A preliminary investigation. *Child Abuse & Neglect, 56,* 80-88.

Allen, J., Marshall, C. R. (2011). Parent-Child Interaction Therapy (PCIT) in school-aged children with specific language impairment. *International Journal of Language Communication Disorders, 46(4),* 397-410. DOI: 10.3109/13682822.2010.517600.

American Psychiatric Association. Diagnostic & Statistical Manual of Mental Disorders 4th Edition (2007). American Psychiatric Association: Arlington, VA.

American Psychological Association Presidential Task Force on Evidence-Based Practice (2006). Evidence-based practice in psychology. *American Psychologist*, *61*, 271-285.

Baron-Cohen, S. (2004). Autism: research into causes and intervention. *Pediatric Rehabilitation, 7(2),* 73-78.

Bjorseth, A., Wichstrom, L. (2016). Effectiveness of Parent-Child Interaction Therapy (PCIT) in the Treatment of Young Children's Behavior Problems. A Randomized Controlled Study. *Plos One, 11(9),* 1-19. DOI: 10.1371/journal. pone.0159845.

Brandino, N., Fusar-Poli, L., Rocchetti, M., Provenzani, U., Barale, F., Politi, P. (2015). Complementary and Alternative Therapies for Autism Spectrum Disorder. *Evidenced-*

Based Complementary and Alternative Medicine, 201, 1-31. DOI: 10.1155/2015/258589.

Buescher, A. V. S., Cidav, Z., Knapp, M., & Mandell, D. S. (2014). Costs of autism spectrum disorder in the United Kingdom and the United States of America. *Journal of American Medical Association and Pediatrics, 168(8),* 721–728.

Centers for Disease Control and Prevention, Autism Spectrum Disorder, Data and Statistics. (2016). http://www.cdc.gov/ncbddd/autism/data.html. Accessed June 20, 2017.

Chasson, G. S., Harris, G. E., & Neely, W. J. (2007). Cost comparison of early intensive behavioral intervention and special education for children with autism. *Journal of Child and Family Studies, 16,* 401–413.

Christ, T. J. (2007). Experimental control and threats to internal validity of concurrent and nonconcurrent multiple baseline designs. *Psychology in the School, 44(5),* 1-10. DOI: 10.1002/pits.20237.

DeMyer, M. K., Barton, S., DeMyer, W.E., Norton, J. A., Allen, J., & Steele, R. (1973). Prognosis in autism: A follow-up study. *Journal of Autism and Childhood Schizophrenia, 3,* 199-246.

Eyberg, S. & Child Study Laboratory (1999). Parent-Child Interaction Therapy: Integrity Checklists and Session Materials. http://www.pcit.org. Accessed January 9, 2017.

Eyberg, S. M., Nelson, M. M., Boggs, S. R. (2008). Evidence-Based Psychosocial Treatments for Children and Adolescents with Disprutive Behavior. *Journal of Clinical Child & Adolescent Psychology, 37(1),* 215-237.

Ginn, N. C., Clionsky, L. N., Eyberg, S. M. (2017). Child-Directed Interaction Training for Young Children With Autism Spectrum Disorders: Parent and Child Outcomes. *Journal of Clinical Child & Adolescent Psychology, 46(1),* 101-109. DOI: 10.1080/15374416.2015.1015135.

Herbert, M. R. (2010). Contributions of the environment and environmentally vulnerable physiology to autism spectrum disorders. *Current Opinion in Neurology, 23(2),* 103-110.

Kanner, L. (1943). Autistic Disturbances of Affective Contact. *Nervous Child, 2,* 217-253.

Langley, E., Totsika, V., Hastings, R. (2017). Parental relationship satisfaction in families of children with autism spectrum disorder (ASD): A multilevel analysis. *Autism Research, 10(7),* 1259 – 1268.

Lavelle, T. A., Weinstein, M. C., Newhouse, J. P., Munir, K., Kuhlthau, K. A., Prosser, L. A. (2014). Economic burden of childhood autism spectrum disorder. *American Academy of Pediatrics, 133(3),* 520-529. DOI: 10.1542/peds.2016-3840.

Leigh, J. P., Du, J. (2015). Brief Report: Forecasting the Economic Burden of Autism in 2015 and 2025 in the United States. *Journal of Autism & Developmental Disorders, 45,* 4135-4139. DOI 10.1007/s10803-015-2521-7.

Lesack, R., Bearss, K., Celano, M. (2014). Parent-Child Interaction Therapy and Autism Spectrum Disorder: Adaptations with a Child with Severe Developmental Delays. *Clinical Practice in Pediatric Psychology 2(1),* 68-82. DOI: 10.1037/cpp0000047.

Lovaas, O. I. (1987). Behavioral treatment and normal educational intellectual functioning in young autistic children. *Journal of Consulting and Clinical Psychology*, 55, 3-9.

Masse, J. J., McNeil, C. B., Wagner, S., Quetsch, L. B. (2016). Examining the Efficacy of Parent-Child Interaction Therapy with Children on the Autism Spectrum. *Journal of Children & Family Studies, 25,* 2508-2525. DOI 10.1007/s10826-016-0424-7.

Matos, M., Bauermeister, J. J., Bernal, G. (2009). Parent-Child Interaction Therapy for Puerto Rican Preschool Children with ADHD and Behavior Problems: A Pilot Efficacy Study. *Family Process, 48(2),* 232-252. DOI 10.1007/s10826-016-0424-7.

McEachin, J. J., Smith, T., & Lovaas, O. I. (1993). Long-term outcome for children with autism who received early intensive behavioral treatment. *American Journal on Mental Retardation, 97,* 359–372.

Neggers, Y. H. (2014). Increasing Prevalence, Changes in Diagnostic Criteria, and Nutritional Risk Factors for Autism Spectrum Disorders. *ISRN Nutrition*, *2014*, 1-14. DOI: 10.1155/2014/514026.

Owens-Smith, A. A., Bent, S., Lynch, F. L., Coleman, K. J., Yau, V. M., Pearson, K. A., Massolo, M. L., Quinn, V., Croen, L. A. (2015). Prevalence and Predictors of Complementary and Alternative Medicine Use in a Large Insured Sample of Children with Autism Spectrum Disorders. *Research in Autism Spectrum Disorder, 17,* 40-51. DOI:10.1016/j.rasd.2015.05.002.

Pollard, C. A., Barry, C. M., Freedman, B. H., Kotchick, B. A. (2013). Relationship Quality as a Moderator of Anxiety in Siblings of Children Diagnosed with Autism Spectrum Disorders or Down Syndrome. *Journal of Children & Family Studies, 22,* 647-657. DOI 10.1007/s10826-012-9618-9.

Reichow, B., Doehring, P., Cicchetti, D. V., Volkmar (2011). Evidence-Based Practices and Treatment with Autism. Springer Science + Business Media: New York, New York.

Reichow, B. (2012). Overview of meta-analyses on early intensive behavioral intervention for young children with autism spectrum disorders. *Journal of Autism and Developmental Disorders, 42,* 512–520. DOI 10.1007/s10803-011-1218-9.

Rice, C. E., Rosanoff, M., Dawson, G., Durkin, M. S., Croen, L. A., Singer, A., Yeargin-Allsopp, M. (2012). Evaluating Changes in the Prevalence of the Autism Spectrum Disorders (ASDs). *Public Health Reviews, 34(20),* 1-22.

Salomone, E. Charman, T., McConachie, H., Warreyn, P. (2015). Prevalence and correlates of use of complementary and alternative medicine in children with autism spectrum disorder in Europe. *European Journal of Pediatrics, 174,* 1277-1285. DOI 10.1007/s00431-015-2531-7.

Sallows, G. O., Graupner, T. D. (2005). Intensive Behavioral Treatment for Children with Autism: Four-Year Outcome and Predictors. *American Journal on Mental Retardation, 110(6),* 417-438.

Slocum, T. A., Detrich, R., Wilczynski, S. M., Spencer, T. D., Lewis, T., Wolfe, K. (2014). The Evidence-Based Practice of Applied Behavior Analysis. *Behavior Analyst, 37,* 41-56. DOI 10.1007/s40614-014-0005-2.

Watson, P. J., Workman, E. A. (1981). The non-concurrent multiple baseline across individuals design: An extension of the traditional multiple baseline design. *Journal of Behavior Therapy and Experimental Psychiatry, 12,* 257-259.

Wing L, Gould J. (1979). Severe impairments of social interaction and associated abnormalities in children: Epidemiology and classification. *Journal of Autism Child Schizophrenia, 9,*

11–29.

APPENDICES

APPENDIX A

Pre/Post PCIT Observation

Observer:

Date: Client Code:

Start Time: End Time:

Duration:

APPROPRIATE VS. INAPPROPRIATE CHILD-DIRECTED INTERACTIONS	
Appropriate	Inappropriate
- Sitting with caregiver - Walking up to caregiver - Engaging in eye contact & saying name/labeling - Bringing activity to caregiver (or vice versa) - Grabbing caregiver's hand	- Whining - Screaming - Hitting - Throwing - Property destruction - Crying - Blocking caregiver

FREQUENCY OF CHILD-DIRECTED INTERACTIONS (BASELINE)	
Environmental condition:	
Appropriate	Inappropriate
Total_____	Total_____

NOTES: _____

_____

_____

APPENDIX B

DPICS Coding Sheet for Therapist

Date_____

Child's name _____

☐ Mother ☐ Father ☐ Other _____

TREATMENT SESSION (CHECK ONE)

O CDI Teach	O CDI Coach #1	O CDI Coach #2	O CDI Coach #3
O CDI Coach #4	O CDI Coach #5	O CDI Coach #6	O CDI Coach #
O PDI Teach	O PDI Coach #1	O PDI Coach #2	O PDI Coach #3
O PDI Coach #4	O PDI Coach #5	O PDI Coach #6	O PDI Coach # ___

CODING CDI IN SESSION

POSITIVE	TALLY CODES	TOTAL	MASTERY
TALK (TA) (ID + AK)			—
BEHAVIOR DESCRIPTION (BD)			10
REFLECTION (RF)			10
LABELED PRAISE (LP)			10
NLABELED PRAISE (UP)			—

AVOID	TALLY CODES	TOTAL	MASTERY
QUESTION (QU)			0
COMMANDS (DC + IC)			0
NEGATIVE TALK (NTA) (CR + ST)			0

POSITIVE	CHECK ONE		
IMITATE	SATISFACTORY	NEEDS PRACTICE	
USE ENTHUSIASM	SATISFACTORY	NEEDS PRACTICE	
IGNORE DISRUPTIVE BEHAVIOR	SATISFACTORY	NEEDS PRACTICE	NOT APPLICABLE

OTHER (SPECIFY)	

TURN OVER TO CODE PDI SKILLS IN SESSION

APPENDIX C

Coding PDI in Session

Command DC or IC?	No Opp	Obey	***Dis-obey***	Praise LP or UP?	Chair Warn	Obey	Dis-obey	Praise LP or UP?	Time-out Chair	Time-out Room

APPENDIX D

CDI Homework Sheet

Mother ___ Father ___

Child's First Name _____

Date	Did you spend 5 minutes in Special Time today? Yes	No	Activity	Problems or questions in Special Time
Monday _____				
Tuesday _____				
Wednesday _____				
Thursday _____				
Friday _____				
Saturday _____				
Sunday _____				

APPENDIX E

Satisfaction Survey

Participant name (parent): _____

PCIT Completion Date: _____

Today's Date : _____

	Not at all				Definitely
1) Did you find the methods of PCIT acceptable?	1	2	3	4	5
2) Would you recommend PCIT to other parents?	1	2	3	4	5
3) Was PCIT worthwhile for your child's behavior?	1	2	3	4	5
4) Do you feel your relationship/interactions with your child improved?	1	2	3	4	5
5) Would you continue implementing PCIT after completion of intervention?	1	2	3	4	5

APPENDIX F

Parent/Guardian Permission to Participate in:
The Effectiveness of PCIT & Children with Autism on Increased Appropriate Child-Initiated Interactions

Informed Consent

INTRODUCTION

My name is Tiffany Thomas. I am a graduate student at Southern Illinois University-Carbondale completing my master's thesis. The following information is provided for you to decide whether you wish your child to participate in this study. You may choose not to sign this form and not allow your child to participate in the study without any penalty. You should be aware that even if you agree to allow your child to participate, you are free to withdraw your permission at any time. If you do withdraw your child from this study, it will not affect your relationship with your service provider, the service it provides you, or Southern Illinois University.

PURPOSE OF THE STUDY

The purpose of the study is to investigate the effectiveness of Parent-Child Interaction Therapy (PCIT) with young children with ASD on increased appropriate child-initiated interactions. Research results will be presented to a committee at SIUC, and possibly published for the purpose of a final thesis project.

PROCEDURES

Participants will be asked to participate in PCIT sessions for 10 minutes per week day. PCIT consists of two phases, with each phase lasting approximately 5 or 6 weeks (10 to 12 weeks total). During sessions, caregiver and child will practice interacting with each other in child-led and parent-led situations while the researcher observes and gives caregiver immediate feedback. At the end of the 10-minute session, the researcher will provide more thorough feedback with the caregiver and determine future goals. In addition, participants are asked to complete five minutes of homework each day; an opportunity to practice outside of treatment. Caregiver(s) and child will be observed by researcher during a specified timeframe to determine frequency of appropriate child-initiated interactions with caregiver(s) pre-treatment (baseline) as well as post-treatment. At the completion of the study, caregiver(s) will be asked to complete a questionnaire pertaining to their experience with PCIT.

COLLECTION OF VIDEO RECORDINGS

During the study, the researchers will collect video recordings of the sessions. These videos will only be shared with the research team (the researcher and faculty adviser). The videos will be used to ensure that the research procedures are implemented correctly by allowing the faculty adviser to give feedback to the researcher on her performance. The videos will also be used to ensure that the learning data collected during the study are recorded correctly.

Information gained from these video recordings will be confidential. All videos will be stored on an secure server and will be permantely deleted at the conclusion of the study. No identifying information, including the video recordings, will be used in any publication or presentation resulting from this study.

RISKS
There are no physical risks associated with participation in this study. Other risks are minimal and may include increased stress for caregiver to produce positive results, as success of the therapy relies on the progression of their interaction skills.

BENEFITS
Benefits of participation in PCIT include teaching parents how to effectively communicate with their child (using clear and concise language). Builds positive relationship and repoire between parent and child. Gives child a sense of control at appropriate times, as well as practicing giving up control. Rigidity is often a symptom of ASD, and practicing relinquishing and regaining control for both parent and child is one of the main benefits of PCIT.

PAYMENT TO PARTICIPANTS
No payment will be made to participating children or caregivers.

PARTICIPANT CONFIDENTIALITY
Within reasonable limits all research materials and records will be stored and transported securely. Paper materials will be kept in a locked cabinet within a locked office to which only the research team will have access. Digital materials, including video recordings, will be kept on an encrypted server. No identifying information will be disclosed in any publications or presentations resulting from the study. Rather, participants will be assigned code names or pseudonyms. At no time will your identity or the identity of your child be released or made available without your explicit, written permission or where required by law.

VOLUNTARY PARTICIPATION
You are not required to sign this Consent and Authorization form. Your decision to allow your child to participate in the study is completely voluntary. Your child will also be asked to agree (assent) to participate in the study. The choice whether to allow your child to participate or not will not affect your or your child's right to any services you are receiving or may receive form Southern Illinois University-Carbondale or to participate in any programs or events of the University. If you choose not to sign, your child simply will not participate in the study.

CANCELLING THIS CONSENT AND AUTHORIZATION
You may withdraw your permission for your child to participate in this study at any time. You also have the right to cancel your permission to use and disclose further information collected about your child, in writing, at any time, by sending your written request to: Jason Hirst (see address below).

If you cancel permission to use your child's information, the researchers will stop collecting additional information about your child. However, the research team may use and disclose information that was gathered before they received your cancellation, as described above.

MANDATORY REPORTING
Under state law, an exception to confidentiality is any incident of child abuse or neglect. During the course of this research study, if the researcher suspects or develops reasonable cause to

believe such an incident has occurred, the primary investigator will be required to contact an appropriate agency.

QUESTIONS ABOUT PARTICIPATION
Questions about procedures should be directed to the researcher(s) listed at the end of this consent form.

PARTICPANT CERTIFICATION
I have read this Consent and Authorization form. I have had the opportunity to ask, and I have received answers to, any questions I had regarding the study. I understand that if I have any additional questions about my child's rights as a research participant, I may call or write to the Human Subjects Committee (HSC).

I agree to allow my child to take part in this study as a research participant. By my signature I affirm that I have received a copy of this Consent and Authorization form.

_____
Print Participant's Name

_____ _____
Parent/Guardian Signature Date
"With my signature, I acknowledge that I am over the age of eighteen, and have received a copy of this consent form to keep."

_____ _____
Investigator Signature Date

RESEARCHER CONTACT INFORMATION

Tiffany Thomas, B.A., RBT Principal Investigator Rehabilitation Institute Southern Illinois University tthomas4@siu.edu	Jason M. Hirst, Ph.D., BCBA-D Faculty Adviser Rehabilitation Institute Southern Illinois University 1025 Lincoln Drive, Mail Code 4609 Carbondale, IL 62901 jmhirst@siu.edu

APPROVAL STATEMENT:
This project has been reviewed and approved by The SIUC Human Subjects Committee. Questions concerning your rights as a participant in this research may be addressed to the Committee Chairperson, Office of Sponsored Projects Administration, Southern Illinois University, Carbondale, IL 62901-4709. siuhsc@siu.edu Phone: 618-453-4533

VITA

Graduate School
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University of Illinois at Chicago
Bachelor of Science, Applied Psychology, December 2008

Thesis Title:
Parent-Child Interaction Therapy for Children with Autism

Major Professor: Dr. Jason Hirst, Ph.D., BCBA-D