Caregiver-Assisted Social Skills Intervention for Preschoolers with Autism Spectrum Disorder: Examining Caregiver-Child Relationships and Family Functioning in the PEERS® for Preschoolers Program

Reina Suzanne Factor

Dissertation submitted to the faculty of the Virginia Polytechnic Institute and State University in partial fulfillment of the requirements for the degree of

Doctor of Philosophy

in

Psychology

Angela Scarpa-Friedman, Chair
Lee D. Cooper
Julie C. Dunsmore
Thomas H. Ollendick

April 30, 2020

Blacksburg, Virginia

Keywords: Autism Spectrum Disorder, Social Skills Intervention, Caregiver Training Intervention, Caregiver-Child Relationship, Family Functioning

Caregiver-Assisted Social Skills Intervention for Preschoolers with Autism Spectrum Disorder: Examining Caregiver-Child Relationships and Family Functioning in the PEERS® for Preschoolers Program

Reina Suzanne Factor

ABSTRACT

Social impairments characteristic of Autism Spectrum Disorder (ASD) are evident in early childhood and often worsen as an individual matures (Rao, Beidel, & Murray, 2008). Despite the emphasis on early intervention and caregiver training, few evidence-based interventions explicitly address the development of social skills in preschool-aged children with ASD (DeRosier, Swick, Davis, McMillen, & Matthews, 2011; Reichow & Volkmar, 2010) and none appear to actively integrate caregivers into treatment (Reichow, Steiner, & Volkmar, 2012). Research indicates that generalization beyond a social skills group setting might occur by including caregivers (DeRosier et al., 2011). The PEERS® program is an evidence-based caregiver-assisted social skills program for adolescents and young adults (Laugeson & Frankel, 2010) that has recently been extended for preschoolers with ASD. An initial randomized controlled trial (RCT) indicated benefits from the PEERS® for Preschoolers (P4P) program, but did not examine caregiver or family outcomes. Researchers also suggest a bidirectional effect in which the family system is impacted by the child with ASD and in turn, the child with ASD is also affected by the family (Karst & Van Hecke, 2012). This study examined the P4P curriculum with 15 children with ASD and their caregivers and examined feasibility of the intervention as well as child social skills, caregiver competency, confidence, and parenting skills in working with their child, and family functioning in the context of the P4P intervention. Results suggest the feasibility of proof concept of applying the P4P curriculum to young children with ASD and

their caregivers. Specifically, this 16-session intervention appears to improve social skills scores in children with ASD, which is maintained 4-6 weeks after treatment, increased scores were noted in caregiver confidence interacting with their children, as well as improved scores in their affect/animation and achievement orientation in interaction styles with their child, and noted improvements in their parenting styles overall score. Therefore, this intervention may have an impact both the child and caregiver in positive ways and these positive results are largely maintained at a follow-up after intervention completion. Future research will need to focus more on the entire family unit, as no changes were noted in the present study, and should examine the specific mechanisms that lead to these positive results regarding child social skills and caregiver interaction styles and confidence. Additionally, more work that adds to making P4P an evidence-based treatment must be at the forefront of future work.

Caregiver-Assisted Social Skills Intervention for Preschoolers with Autism Spectrum Disorder: Examining Caregiver-Child Relationships and Family Functioning in the PEERS® for Preschoolers Program

Reina Suzanne Factor

GENERAL AUDIENCE ABSTRACT

Social difficulties (e.g., initiating and/or maintaining social interactions, using and/or interpreting verbal and nonverbal social communication, such as eye contact or gestures, understanding others' thoughts and emotions) characteristic of Autism Spectrum Disorder (ASD) are evident in early childhood and often worsen as an individual matures (Baron-Cohen & Wheelwright, 2004; Frith, 2004; Rao, Beidel, & Murray, 2008). Despite the emphasis on early intervention or treatment for individuals with ASD and caregiver (e.g., parent, grandparent, etc.) training, few evidence-based interventions exist that purposefully address the development of social skills in preschool-aged children (DeRosier, Swick, Davis, McMillen, & Matthews, 2011; Reichow & Volkmar, 2010) and none appear to actively involve caregivers in treatment (Reichow, Steiner, & Volkmar, 2012). Research indicates that generalization beyond a social skills group setting might occur by including caregivers (DeRosier et al., 2011). The PEERS® program is an evidence-based caregiver-assisted social skills program for adolescents and young adults (Laugeson & Frankel, 2010) that has recently been extended for preschoolers with ASD. An initial randomized controlled trial (RCT) indicated benefits from the PEERS® for Preschoolers (P4P) program, but did not examine caregiver or family outcomes. Researchers also suggest that there is often an effect on the entire family unit of a child with ASD, which in turn has an impact on the child with ASD (Karst & Van Hecke, 2012). This study examined the P4P curriculum with 15 children with ASD and their caregivers, and examined feasibility of the

intervention as well as child social skills, caregiver competency, confidence, and parenting skills in interacting with their child, and family functioning in the context of the P4P intervention. Results suggest that this 16-session intervention appears to improve social skills scores in children with ASD, and these improved scores are largely maintained 4-6 weeks after treatment. Increased scores were also noted in caregiver confidence in interacting with their children as well as in their affect/animation and achievement orientation in interaction styles, and may also improve their parenting style scores overall. Therefore, this intervention may have an impact on both the child and caregiver in positive ways. Future research should address the entire family unit, as no changes were noted in the present study, and should also examine the specific factors that lead to these positive results, as further research adds to P4P becoming an evidence-based treatment

Acknowledgments

There are many people I wish to thank for supporting me in completing this dissertation, as well as throughout my entire graduate school journey. First, I would like to thank my advisor, Dr. Angela Scarpa, for her constant advice, mentorship, and guidance throughout the past 6 years, in various realms of clinical science, and specifically in completing this dissertation. Even from afar, I felt her support and have learned so much from her knowledge and example of leadership. A special thank you to all of my committee members, which include Dr. Scarpa, Dr. Lee Cooper, Dr. Julie Dunsmore, and Dr. Tom Ollendick, who have provided invaluable insight throughout the development of this project and regarding my thesis, preliminary examination, and in other capacities during graduate school. I feel extremely fortunate to have learned from such exceptional scholars, researchers, and clinicians. I would especially like to thank Dr. Ollendick for his guidance regarding single-subject design and analyses in designing this intervention study. Additionally, I would like to thank the UCLA PEERS® Clinic for sharing P4P materials, allowing a team from Virginia Tech to attend an onsite training, and providing resources and guidance in the development of this project and in the early stages of running P4P groups. I am deeply grateful for this wonderful partnership.

Since this project occurred in two locations, I have been doubly fortunate to have two wonderful teams. The resources provided through the Virginia Tech Autism Clinic to run the groups and in recruitment truly made this project possible. I would also like to thank the Georgia Autism Center, where I ran the groups in Atlanta and recruited many families in the study from their far-reaching clientele. I would also like to thank the Emory Autism Center and especially Dr. Opal Ousley, not only for allowing me to use testing resources, but also for Dr. Ousley's support, guidance, and mentorship for over 10 years, from the time I was an undergraduate. In addition, this study would not have been possible without the group leaders and assistants, both in Atlanta and Blacksburg, all of whom gave their time in completing the training, many weekends and hours running groups, and flexibility in fulfilling different roles. I was lucky to have such a huge and skilled team supporting me, and thanking each person by name would likely make this a short novel, so a global thank you to all! Special thanks to the fabulous Research Assistants at Virginia Tech, who scored and entered data, which was critical to completing the analyses. A shout out to my PANDA lab mates, many of whom served as group leaders, assisted with recruitment, assessments, and organizing the groups in Blacksburg. I am beyond thankful for your support with this study. Perhaps most importantly, a huge thank you to the families who participated in this study, without whom this study would not be possible.

Regarding funding, I would like to thank the Virginia Tech Center for Autism Research for receiving the Virginia Tech Center for Autism Research Student SEED Award (2016 – 2017 and 2018 – 2019) and the Psi Chi Honor Society for receiving the Mamie Phipps Clark Diversity Research Grant (December 2018 – July 2019), both of which provided funds which allowed for protocols, group supplies, prizes, and other essential resources for the groups to be run.

Finally, I would like to thank my constant support system, who lifted me up when I needed it, gave me encouragement, and never stopped believing in me: again my wonderful PANDA lab mates, my fabulous cohort family, who I am honored to be part of, friends near and far who were my perpetual cheerleaders, and lastly, but certainly not least, my exceptional family. They have been there for me at all hours, listened to my concerns, edited documents, encouraged me, and made me feel I had a team behind me, even from across the country. Thank you for your unwavering support, which I have been fortunate to have felt for my entire life, and for being my heroes and the embodiment of goodness.

Table of Contents

List of Tables

List of Figures

Chapter 1: Introduction

Social competence is considered one of the fundamental deficits for children with Autism Spectrum Disorder (ASD; American Psychiatric Association, 2013). Obstacles related to social functioning include a lack of initiating and maintaining social interactions (Frith, 2004), using and interpreting both verbal and nonverbal social communication, understanding others' thoughts and emotions, and a lack of empathy (Baron-Cohen & Wheelwright, 2004). In addition to a lack of social awareness, other common characteristics of ASD such as restricted interests, rigidity, and a general lack of awareness can impede a child's ability to make and maintain friendships (Bellini, Peters, Benner, & Hopf, 2007). These social difficulties are often evident as early as preschool (Paul, 2003) and can become more complex and prominent as a child matures (Chamberlain, Kasari, & Rotheram-Fuller, 2007; Rao, Beidel, & Murray, 2008).

However, despite increasing implementation of early intervention and the fact that social impairments in ASD are in fact evident in early childhood (Rao et al., 2008), few evidence-based interventions explicitly address the development of social skills in preschool-aged children with ASD (DeRosier et al., 2011; Reichow & Volkmar, 2010). Additionally, while a number of different treatment models currently exist that require the caregiver or family member to perform time-intensive protocols (Tsao & Odom, 2006), no currently available social skills treatments for preschool-aged children appear to actively integrate caregivers into treatment (Reichow, Steiner, & Volkmar, 2012). However, research suggests that generalization beyond a social skills group setting might be facilitated by including caregivers in treatment (DeRosier et al., 2011).

While child outcomes are important targets of interventions, caregiver and family outcomes are essential in both maintenance and generalization of child gains. These factors include family functioning, caregiver-child relationships, and caregiver efficacy (Karst & Van

Hecke, 2012). Ignoring the caregiver component can have deleterious effects (e.g., poor mental health) for the caregiver, which in turn also negatively impact the child and outweigh any gains made by the child over the course of a treatment program (Gulsrud, Jaromi, & Kasari, 2010). Researchers also note that gains made by the child with ASD completing an intervention must also be compared to effects on the family to truly measure overall improvements (Lord & Bishop, 2010); however, this integrative model is not often addressed in ASD intervention research.

Family Systems Theory (FST) emphasizes the notion that the family is in fact a system, and an individual is part of that family process and therefore can never truly be independent (Minuchin, 1985). The incorporation of caregivers and other family members in interventions is increasing as caregivers are now included either directly or indirectly in a number of ASD interventions (Schertz, Baker, Hurwitz, & Benner, 2011). Thus, considering all aspects of an individual's broader family environment and relationships is necessary to achieve the most beneficial intervention outcomes.

One specific type of intervention, social skills groups, has been developed for children and young adults with ASD. The Program for the Education and Enrichment of Relational Skills (PEERS®; Laugeson & Frankel, 2010) is an evidence-based social skills treatment for youth and young adults with ASD (Laugeson, et al., 2009; Laugeson, et al., 2012). Therefore, building on the success of the PEERS® Program for adolescents and young adults, a PEERS® for Preschoolers (P4P) program has been developed and initial results suggest positive outcomes (e.g., increased social skills, reduction in ASD symptoms and problem behaviors; Laugeson, Park, Bolton, Bolourian, & Sanderson, 2016).

Given this information, studying social skills and caregiver and family functioning in the context of social skills interventions seems to be a logical next step; however, there is no research on this area to date. Therefore, this study seeks to fill this crucial gap in our knowledge. The aims of this study include: 1) to apply the P4P curriculum and examine social skills improvement in the child, 2) to examine caregiver confidence in interacting with their child, 3) to explore the caregiver-child relationship and interaction style over the course of treatment, and 4) to investigate family functioning in the context of treatment.

Social Impairments in Children with ASD

Social impairments characteristic of ASD are evident in early childhood and are likely to worsen as an individual matures (Rao et al., 2008). These social difficulties are a hallmark of ASD and cause impairment, regardless of cognitive or language ability (Carter, Davis, Klin, & Volkmar, 2005). Some findings suggest that social difficulties, including social reciprocity, are the most powerful predictors differentiating ASD from other developmental disabilities (Siegel, Vukicevic, Elliott, & Kraemer, 1989). Early signs of social reciprocity deficits are often present even pre-verbally, in individuals later diagnosed with ASD (Mundy, 2016). Specifically, lack of early reciprocal actions (e.g., social smiling, eye contact, orienting, and facial processing) may reflect deficits or delays in development of early social-communication skills, which can in turn lead to more pronounced deficits (Farroni, Csibra, Simion, & Johnson, 2002; Messinger, Fogel, & Dickson, 2001). In addition to early social deficits, social skill difficulties present in individuals with ASD can include struggling to understand social pragmatics (e.g., turn-taking in conversation, initiating conversation, taking the listener's perspective), perseverative speech, and emotion regulation, expression, and understanding (Williams White, Keonig, & Scahill, 2007). Thus, these deficits are widespread and impact various facets of an individual's social world.

Regarding friendships, youth with ASD tend to spend less time interacting with peers, when they do interact these exchanges are low-quality, they often remain farther apart from peers physically, and they spend more time engaged in non-goal-directed activities (Lord & Magill-Evans, 1995; Sigman & Ruskin, 1999). Self-reports from children with ASD indicate that they experience having fewer friends at school, these friendships are of diminished reciprocity, and they often have smaller social groups (Bauminger, Shulman, & Agam, 2003; Kasari, Locke, Gulsrud, & Rotheram-Fuller, 2011). In contrast to findings that children with ASD lack social motivation, individuals with ASD report a desire for more peer interaction, poor social support, and more loneliness than their typically developing (TD) peers (Bauminger & Kasari, 2000). Therefore, children with ASD can be "painfully aware of their social skills deficits" (Knott, Dunlop, & Mackay, 2006).

As individuals mature, these social problems can also increase risk for aggressive behaviors, rejection by peers, loneliness, social dissatisfaction, and academic failure, as well as other problems (Maag, 2006). Further, though individuals classified as high functioning (HFA) might perform to grade level on academic tasks, they often struggle in the social realm, which impacts their overall school experience and functioning (Kasari et al., 2011). Additionally, results are mixed regarding mainstreaming HFA adolescents with ASD. While they can observe how to interact appropriately through watching their classmates, they report poorer quality friendships than their TD peers, in addition to difficulties noted above (Bauminger & Kasari, 2000). As such, it is important to help children with ASD improve their social competence and provide them with this help as early as possible.

Social Skills Interventions

Despite the emphasis on early intervention and social skills, few evidence-based interventions exist that explicitly address the development of social skills in preschool-aged children (DeRosier et al., 2011; Reichow & Volkmar, 2010) and none appear to actively integrate caregivers into treatment (Reichow, Steiner, & Volkmar, 2012). Further, social communication skills are often cited as top treatment concerns for children with ASD (Watkins, Kuhn, Ledbetter-Cho, Gevarter, & O'Reilly, 2017). Though support has been implicated for social skills interventions across the lifespan (Reichow & Volkmar, 2010) and interventions for social deficits in people with ASD suggest positive gains (White & Maddox, 2013), these gains are frequently minimal and not often maintained beyond treatment (Bellini et al., 2007). Additionally, only some social skills groups collect follow-up data to examine long-term benefits (Mandelburg et al., 2014). Even in older children with HFA ASD, there has been little research about evidence-based treatments that target both social engagement and long-term relationship development (Kasari & Rotheram-Fuller, 2005).

While social skills groups can take many forms, one study suggested that a group consisting of all children with ASD rather than a mixed group (i.e., TD children and children with ASD) was more effective in teaching social skills (Kasari et al., 2015). Additionally, looking at an intervention that targets peer engagement on the playground, an adult-led didactic social skills format with children from different grades and classes was found to be more effective for improving peer acceptance and engagement than a naturalistic, activity-based intervention for children with and without ASD from the same classroom (Kasari et al., 2015). Therefore, there are various formats of groups that seem to be effective. A specific social skills intervention, Children's Friendship Training, suggests that when looking at long-term follow-up results (i.e., 3 months after completing treatment), caregivers reported that their children were invited on more playdates and, during these get-togethers, the children demonstrated less conflict than they had before starting treatment (Mandelburg et al., 2014). Additionally, in the same study, children themselves reported decreases in loneliness from baseline, though these results were only marginally significant. Based on these findings, social skills interventions do seem to have positive impacts on social relationships and functioning.

In terms of social skills interventions specifically for preschoolers, fewer exist than those for older children with ASD. A number of interventions for preschoolers are designed to work on language and social skills are secondary treatment targets. While many reviews have been conducted on social skills interventions, in one review, out of 48 studies that looked at social skills groups for individuals with ASD (Kaat & Lecavalier, 2014), only two studies included participants younger than 6 years old. One specific intervention, the Superheroes Social Skills Program (Jenson et al., 2011), is a manualized intervention that incorporates didactic training and behavioral rehearsal, as well as feedback. Success in increasing social skills has been found in preschoolers with ASD when implementing this intervention (Radley et al., 2015). Video modeling (Murdock, Ganz, & Crittendon, 2013) has also been found to apply to children with ASD with various levels of cognitive and language ability in teaching social skills. Another intervention used an applied behavior analysis (ABA) approach to teach social skills to children with ASD. Results suggested improvements in social skills over the course of 32, 2-hour sessions (Leaf et al., 2016). Though these indicate positive results, social skills interventions specifically targeting preschoolers with ASD seem to still be developing, and research suggests that few manualized interventions are currently available (Lord et al., 2005).

PEERS® is an evidence-based caregiver-assisted social skills treatment for youth with ASD (Laugeson, et al., 2009; Laugeson, et al., 2012) and uses a behavioral approach to enhance social functioning. It has been established as effective in multiple clinical and randomized controlled trials (RCT) with adolescents (Laugeson et al., 2009; Laugeson, et al., 2012; Van

Hecke et al., 2015; Yoo et al., 2014) and young adults with ASD (Gantman et al., 2012; Laugeson et al., 2015), showing long-term maintenance of treatment gains even 1–5 years following intervention (Mandelberg et al., 2014). PEERS® has a structured child group with a simultaneous parent/caregiver group in which participants discuss psychoeducation, skills their children are learning, and strategies for being a social coach.

While intervening when an individual is older is beneficial, targeting these social skills early to treat these impairments may lead to enhanced short- and long-term outcomes as well as contribute to an overall improved quality of life (Watkins et al., 2015). Therefore, a program designed for preschoolers to target these social difficulties is especially beneficial and critical for this population.

Caregiver Involvement in Interventions

Caregivers, specifically parents, are positioned in a unique role in that they can influence a child's development and interact with them over their lifetime (Tomasello, 2001). Thus, an individual's relationship with a caregiver serves as a model for social learning, which makes caregiver involvement in intervention, along with studying caregiver-child relationships, especially salient in examining social skills. Caregiver and general family involvement is an essential intervention component for children with ASD (Lord et al., 2001). There has been a movement towards a more family-focused model rather than a professional-driven one for children with ASD, where family members are active participants or administrators in treatment and in the everyday life of the child (Dixon et al., 2004; Thompson et al., 1997). A review noted that 52% of ASD services focus on the parent–child relationship and 59% of interventions involve parents in intervention implementation (Schertz et al., 2011). These results intimate that the integration of caregivers in interventions is increasing. Positive impacts of incorporating caregivers in interventions include improved caregiver responsiveness, decreased caregiver stress and depression, improved caregiver mental and physical health (Karst & Van Hecke, 2012; McConachie & Diggle, 2007; Roberts & Pickering, 2010; Solomon, Goodlin-Jones, & Anders, 2004; Whittingham, Sofronoff, Sheffield, & Sanders, 2009), and more parenting self-efficacy (PSE; Sofronoff & Farbotko, 2002; Whittingham et al., 2009). Additionally, decreases in both the time and monetary investments often required for ASD interventions may be reduced with caregiver involvement (Lord & Bishop, 2010). Thus, many interventions place the caregiver as the facilitator of the intervention implementation and their child's development in general (Larkin, Guerin, Hobson, & Gutstein, 2015). On the other hand, some negative outcomes regarding caregiver involvement in interventions have been indicated, such as more investment of money as well as energy and time, which could lead to caregivers devoting less attention to other family members or family functioning (Benson & Karlof, 2008; Johnson & Hastings, 2002).

Various treatment models currently exist for ASD that require the caregiver to perform time intensive protocols. Manualized caregiver-administered interventions are often complex and require extensive training and high accuracy to be effective (Rogers et al., 2012). Caregiver training teaches caregivers how to employ strategies for dealing with specific behavior (e.g., disruptive behaviors), and this method has been found to enhance psychopharmacological treatment as well as improvements in child behavior (Bearss, Johnson, Handen, Smith, & Scahill, 2013). Psychoeducation covers fundamental information without providing specific strategies or hands-on training to caregivers for working with children with ASD. Though these have all been found to be efficacious, the most salient results are generated by caregiver-mediated interventions and caregiver training, especially for social skills acquisition (Gantman et al., 2012;

Laugeson et al., 2009; 2012). Research indicates that generalization of social skills beyond a group setting (e.g., at school, home, with peers), might occur by including caregivers in treatment (DeRosier et al., 2011). While child outcomes are important targets of interventions, caregiver and family outcomes play a large role in maintenance and generalization of gains made by the child. These factors include family functioning, caregiver-child relationships, and caregiver efficacy (Karst & Van Hecke, 2012). Thus, it seems reasonable and beneficial to focus on caregiver and family functioning.

Results suggest that though the specific aspects of treatments may vary, caregiver participation is a key component for encouraging child outcomes (Granger, des Rivières-Pigeon, Sabourin, & Forget, 2012). In examining elements of these caregiver-administered interventions that make them effective, research has examined the ideal amount of caregiver involvement in working with the child with ASD (Luiselli, Cannon, Ellis, & Sisson, 2000). One finding indicated that caregiver stress decreases with low-intensity treatment (Brookman-Frazee & Koegel, 2004); however, the lower treatment amount may also lead to decreased improvement in child outcomes. Wan et al. (2013) found that qualities of caregiver-child interaction (e.g., more directive, lower ratings of dyadic mutuality, and intensity of engagement) in infants at-risk for ASD were associated with ASD outcome at 3 years. Consequently, concentrating on interventions that champion the caregiver-child relationship may help ameliorate negative effects of a difficult relationship on family dynamics, and potentially also on specific features of ASD.

Family Functioning in ASD

Given that caregiver involvement is becoming more common in ASD interventions, studying families with a child with ASD seems essential in the context of treatment. However, even with this knowledge that families are critical in the life of an individual with ASD, there is little research on the influence of family support and functioning (Blackledge & Hayes, 2006; Grindle, Kovshoff, Hastings, & Remington, 2009; Rao & Beidel, 2009). One study suggested that in families with a child with ASD, poorer family functioning was found if the child had higher levels of externalizing behaviors, but not in those with higher levels of internalizing behaviors (Sikora et al., 2013). Another study found that caregivers of children with ASD reported lower marital happiness, family cohesion, and family adaptability than caregivers of TD children (Higgins et al., 2005). Yet another study established that family adaptability (i.e., the family system being able to change when faced with either situational or developmental stressors; Minuchin, 1974; Olson, Sprenkle, & Russell, 1979), predicted change in child behavior problems regardless of whether the individual with ASD exhibited intellectual disability (Baker et al., 2011).

Additionally, family conflict has also been studied in families with a child with ASD, such that family conflict was more predictive of ASD symptomatology than positive family or peer influences (Kelly, Garnett, Attwood, & Peterson, 2008). This again reflects the impact that family dynamics can have on the individual with ASD, underscoring the bidirectionality of these characteristics and familial relationships. For instance, more conflict might prevent engagement in enjoyable activities, while instead caregivers may spend more time punishing and arguing with their child due to behavioral difficulties (Lam, Wong, Leung, Ho, & Au-Yeung, 2010). Therefore, families of a child with ASD seem to be a unique population regarding these specific family variables.

Another family characteristic, chaos, defined as a lack of order in the family system, is often experienced at higher levels in families with a member with ASD (Karst et al., 2015). Maladaptive coping behaviors, which are linked to disorganization (i.e., chaos), can lead to greater risk of conduct and emotional problems in children with ASD (Midouhas, Yogaratnam, Flouri, & Charman, 2013; Osborne, McHugh, Saunders, & Reed, 2008; Sivberg, 2002), once again illustrating the transaction between family environment and a child's functioning. Findings also suggest that increased chaos contributes to decreased family quality of life in families with children with ASD (Mugno, Ruta, D'Arrigo, & Mazzone, 2007; Sivberg, 2002).

Relationships within the family are likely to be impacted by these larger family functioning concerns. Regardless of the functioning level of the child, previous work has found that raising a child with ASD can negatively impact the well-being of caregivers and families (Ekas, Lickenbrock, & Whitman, 2010). Additionally, caregivers with children with ASD might engage more in disciplinary actions and maladaptive interaction patterns in exchanges with their children and other family members (Karst et al., 2015). Thus, caregivers are not modeling healthy relationships in their interactions with others, and the child with ASD may not learn appropriate social skills as easily, adding to family dysfunction.

Though most research focuses on negative influences of having a family member with ASD, there are also positive influences on family functioning and relationships. Hoffman et al. (2009) suggested the ASD diagnosis might actually serve as a protective factor in that caregivers place less blame on the child for misbehavior. Other positive influences indicated for family members of an individual with ASD include psychological and emotional strength, improved communication skills, more empathy, and increased patience (Cridland, Jones, Magee, & Caputi, 2014). Therefore, there may be increased support from individual relationships within the family and family cohesion (Baker, Seltzer, & Greenberg, 2011), both especially important resources for caregivers (Baker et al., 2011). This points to the need to focus on family variables and relationship outcomes in intervention work.

It seems that with the increase in caregiver-administered interventions, there would be a push to also examine how these interventions impact family functioning and relationships, not just individuals in isolation. However, this topic has not been examined in detail in intervention work, and researchers note that gains made by the child with ASD in completing an intervention must also be compared to effects on the family (Lord & Bishop, 2010). One study examined family functioning in the context of PEERS® for adolescents and found a significant interaction effect between group and time, with the experimental group showing a significant decrease in family chaos over time (Karst et al., 2015). Thus, findings suggest that completing the PEERS® intervention does improve family chaos, even when this characteristic and family functioning and relationship outcomes were not specifically targeted.

To the degree that research has been conducted, including caregivers and other family members in intervention seems to benefit the whole family unit, with improvements in the marital, caregiver-child, and sibling relationships (Karst & Van Hecke, 2012; Rogers, 2000; Schertz & Odom, 2007; Schreiber, 2011). One study found that maternal home-based educational involvement in the treatment of their children with ASD was linked to decreased psychological distress, increased parenting efficacy, and more family cohesion (Benson, 2015). However, most outcome studies have focused on only the child with ASD, ignoring family context. From a family systems perspective, this does not provide a comprehensive picture of the broader family environmental impact of the given intervention (Karst &Van Hecke, 2012).

Given that FST emphasizes the reciprocal influences of family members on each other (Cox & Paley, 1997), this seems essential in studying families with a child with ASD, especially since social reciprocity is a deficit of ASD, and thus likely impaired (APA, 2013). Therefore, family reciprocal relationships and general family functioning are potentially already compromised or more different than that of families of TD children and looking at the family is critical to understanding social functioning.

The PEERS® for Preschoolers Program

While there are few to no social skills groups for preschoolers with ASD, recently the PEERS® program has been adapted for preschoolers with ASD (Laugeson et al., 2016), though this adaptation is not yet evidence-based. An initial RCT indicated benefits from the P4P program, but did not examine caregiver or family outcomes. The P4P group highlights some of the same tenets of the PEERS® programs for adolescents and young adults, but presents them in a more developmentally appropriate manner. Further, while the caregiver training component is still present in P4P groups, there is an added caregiver-coached play piece at the end of each session. This allows caregivers to engage in the skills taught and to be coached by a clinician on their own social coaching skills.

While formal results have not yet been published, initial findings for pilot groups suggest positive results. A pilot RCT study with 19 children (males = 16; females = 3) from 4-6 years of age (*M* = 4.68; *SD* =.29) participated in a P4P group and results indicated significant improvements in social skills (Laugeson et al., 2016). Further, a MANOVA revealed that children in the treatment group demonstrated significant increases in social skills and reduction in ASD symptoms and problem behaviors.

Karst and Van Hecke (2012) proposed a model in which two primary domains – 1) caregiver and family outcomes and 2) child outcomes – would be consistently evaluated both as outcome measures of interventions and in the context of their relationship with one another. Considering this model, examining the child, caregiver, and the family component in the context of P4P is a necessary next step and takes a more holistic view in evaluating the P4P intervention.

To further this research and address this need, the current study is an independent replication of P4P and additionally examines child and caregiver treatment outcomes in terms of child social skills, caregiver-child relationships, caregiver confidence, and family functioning. Also, as an independent replication of P4P, this study provides a necessary step towards establishing an evidence-based intervention. The hypotheses examine a number of questions in the following domains over a 16-session social skills program:

1) <u>Social skills</u>: a) children with ASD will increase their caregiver-reported social skills (measured via session-administered social skills monitoring forms) and these improvements will be maintained after treatment and at follow-up; b) there will be a decrease in ASD symptoms related to social functioning (measured via the Social Responsiveness Scale, Second Edition, Social Skills Improvement System, and The Quality of Play Questionnaire) from entry/pre-treatment to exit/post-treatment that will be maintained at follow-up.
2) <u>Caregiver efficacy and behavior</u>: a) caregivers will increase their knowledge of social skills and strategies for their children (measured via a social skills monitoring form administered each session); b) caregivers will gain more self-efficacy (measured via the Parental Self-Efficacy in the Management of Asperger Syndrome) in dealing with their children's social interactions and acting as a facilitator from entry/pre-treatment to exit/post-treatment that will be maintained at follow-up; c) caregiver-child interactions will improve in responsiveness, affect, achievement, and directiveness (measured via the Maternal Behavioral Rating Scale) from entry/pre-treatment to exit/post-treatment that will be maintained at follow-up; d) parenting styles will improve overall (total score), and specifically in the domains of laxness,

overreactivity, and verbosity (measured via the Parenting Scale form administered each session) and the total score will improve from entry/pre-treatment to exit/post-treatment and will be maintained at follow-up.

3) Family functioning: household chaos (measured via the Confusion, Hubbub, and Order Scale administered each session) will improve from entry/pre-treatment to exit/post-treatment and will be maintained at follow-up.

By testing these hypotheses, this study will provide initial evidence of whether this treatment works, and how it impacts the child with ASD, caregiver involved, and the family unit.

Chapter 2 – Method

Participants

Fifteen children ranging from 4-7 years of age diagnosed with ASD without intellectual impairment and their caregivers were recruited (i.e., 2-5 children and caregivers in four groups). Fifteen caregiver/child dyads (11 boys; 66.7% Caucasian) ranging from 3 (4 when group began) to 7 years old (*M* = 4.87, *SD* = 1.25) participated in P4P groups (4 groups in total). In order to be eligible for the study, children were required to have a previous ASD diagnosis, which was verified by meeting the cutoff for autism spectrum or autism classifications on the Autism Diagnostic Observation Schedule, Second Edition (ADOS-2), as administered by a research-reliable investigator. Additionally, children were required to be fluent in English, have a caregiver fluent in English and willing to participate in the group, have an Intelligence Quotient (IQ) greater than 70 on the Kaufman Brief Intelligence Test, Second Edition (KBIT-2), be toilet trained, and be able to tolerate a group setting, play preschool games, and sing songs. Exclusion criteria included the presence of an active medical problem (e.g., unstable seizure disorder), severe mental health problems (e.g., psychosis, bipolar disorder), physical aggression towards adults or children, or if the child was unable to be maintained on current medication over the course of treatment. Those that met eligibility criteria were invited to participate in the 16-session P4P program, and program completers were identified as those who attended at least 60% of sessions (see Figure 1 for CONSORT diagram indicating flow of participants). No differences in demographic information were present across sites or groups, thus, all demographic information and measure means are presented together. Of note, missing data due to a lack of 5 families completing exit/post-treatment data limited the total sample size at the exit/post-treatment timepoint to 10 families.

Regarding the ADOS-2, ten Module 3s were administered (for verbally fluent children), while five Module 2s were administered (for children with phrase, but not verbally fluent, speech). Severity scores ranged from 4-10 (*Mcomparison score* = 6.80, *SD* = 2.01), KBIT-2 IQ Composite scores for the overall sample fell in the average IQ range (*M* = 102.00, *SD* = 15.34).

The racial make-up of this sample of children consisted of 66.7% Caucasian, 6.7% Asian American/Asian origin, 13.3% African American, 6.7% mixed race, and 6.7% reported other. In addition, as mentioned above, all children had previous diagnoses of ASD and the current sample also included 40% of children with previous diagnoses of Attention Deficit/Hyperactivity Disorder (ADHD), 20% with Generalized Anxiety Disorder (GAD), 20% with Obsessive-Compulsive Disorder (OCD), and 6.7% with a Developmental Disability diagnosis, based on caregiver report. Caregiver ages ranged from 27-42 years (*M* = 36.13 years, *SD* = 5.14). Some families had the same caregiver attend each session, whereas other families alternated or had both caregivers attend each session. Of the target caregivers (i.e., the caregiver who completed interaction tasks and measures at specified timepoints), 93.3% were mothers. One family had the father complete the interaction-task at the follow-up visit only, though the mother completed all other interaction tasks. Family makeup included 26.75% without siblings (i.e., the child in the P4P group was the only child in the family), 46.7% with one sibling, 20% with two siblings, and 6.7% with three siblings. Marital status was only reported by three families (13.3% married; 6.7% widowed). Finally, family income ranged from less than $10,000 to $200,000 or more per year and caregiver education ranged from completing high school to completing graduate school. See Table 1 and Table 2 for detailed demographic information.

Participants were recruited via multiple methods (e.g., university and non-university clinics, registries, local ASD support groups, parent resource centers, local service agencies or schools) through the greater Atlanta area as well as through the New River Valley in Southwest Virginia. A two-stage eligibility process was used (see Figure 1). First, caregivers who expressed interest in the study completed a phone interview to screen for study eligibility. Caregiver and child dyads who appeared to meet eligibility criteria and who were still interested in the study based on the phone screen were then scheduled for an assessment appointment to confirm eligibility. Twenty-nine caregivers completed the phone screen, and ultimately 18 caregiver-child dyads were found to be eligible to participate in the study after the eligibility appointment. Upon completion of all pre-intervention measures, eligible families were invited to join the group. As noted above, of the 18 eligible families, one family started the group, but left due to medication changes during the course of the group and violent behaviors that suggested the group was not a good fit for the child. Another family did not participate due to time commitment and a third family joined for only one session, but was unable to commit due to child health difficulties. Thus, they did not complete the intervention and analyses are based on the 15 intervention completers. Participants were classified as treatment completers if they attended more than 60% of sessions (most completed more than 75% of sessions).

Procedure

The same procedure was followed for all four intervention groups. Interested caregivers were contacted to complete a phone screen to assess preliminary eligibility, learn information about the study, ask any initial questions, and schedule a pre-treatment visit. All caregivers provided written consent and child verbal assent was obtained for permission for study participation and the pre-intervention assessment determined eligibility. Assessment sessions were conducted at two locations (the Georgia Autism Center and the Virginia Tech Autism Clinic), lasting approximately 1.5 hours. Initial eligibility visits included the ADOS-2, KBIT-2, a

5-minute interaction task between the caregiver and child to assess their interaction styles (more details below), and caregiver completion of a number of forms to be turned in at the start of the group (entry/pre-treatment forms). Caregivers were also given forms to be completed for baseline measures and were told they would receive further instruction regarding when to complete these forms (more details below).

In addition to baseline and weekly measures, data were collected over the course of four timepoints (i.e., entry/pre-treatment, mid-treatment (Session 8), exit/post-treatment, and a 4-6 week follow-up visit after treatment completion). See Appendix A for the complete battery at each timepoint. All questionnaire data were collected via paper and pencil, and data were analyzed and collapsed over all groups. Approval for this research design was granted by the Institutional Review Board of Virginia Tech, Emory University, and Children's Healthcare of Atlanta. Families did not receive any compensation for participating in groups.

Randomization. Employing a nonconcurrent multiple baseline design, each group was randomized to a baseline condition. Baseline conditions included groups maintaining a 1.5 week (Group 2), 2 week (Group 3), or 2.5 week (Groups 1 and 4) baseline period, with measures completed every half week. In other words, they completed baseline measures either three times (i.e., 1.5 week baseline: twice for whole week and once during half week), 4 times (i.e., 2 week baseline: twice per week), or 5 times (i.e., 2.5 week baseline: twice per week and once during the half week). This is the same consistency of completion as when the group began. Specifically, this design is a series of A-B replications and was chosen to allow for rolling enrollment (i.e., ongoing enrollment over data collection for the multiple baselines) as well as a smaller sample. Single-case designs are often less time intensive and more cost-effective than large scale RCTs and therefore more feasible in early stages of treatment development (e.g., examining feasibility, need for treatment modifications; Horner et al., 2005; Morgan & Morgan, 2008). In general, intervention studies using a multiple baseline design and looking at social skills in children with ASD range from single-subject design (Wang, Parrila, & Cui, 2013) to 10 participants (Rao, Beidel, & Murray, 2008). Therefore, the proposed sample size seemed appropriate and this research design has been deemed effective for establishing whether an intervention leads to new skills (Smith et al., 2007).

Each group was considered an individual in this context, and thus were assigned baselines accordingly. During the baseline period, caregivers completed a rating of social skills, which also included a measure of caregiver confidence and stress, a measure of parenting style, and a measure of family functioning. Each caregiver was contacted before the baseline period and when each measure was required to be completed. Completed measures were turned in at the first session. These same measures were administered during the intervention, at exit/post-treatment, and at a 4-6 week follow-up visit. All measures are described in greater detail below.

Treatment. The format for teaching followed the P4P manual, made available from the UCLA PEERS® Clinic. Though there is not yet a published manual, there is an unpublished manual with instructions and a script for each child and caregiver session which was provided across sites and clinicians. P4P Treatment involved the adaptation of an empirically supported social skills intervention for preschool-aged children with ASD (Laugeson, Sanderson, & Park, 2014) by integrating elements established by the UCLA PEERS® program (Laugeson & Frankel, 2010). Groups consisted of 16 1.5 hour sessions that met twice per week at specified locations in Atlanta, GA and Blacksburg, VA to ensure the target group size was met. Usually groups meet once per week, though groups in the present study met twice per week for all intervention groups to complete the intervention in the allotted timeframe.

Each P4P group consisted of 2-5 children with 4-7 student clinicians. All clinicians were trained on P4P procedures, based on a one-day intensive training which reviewed the basics of P4P and the outline, didactic/lesson targets, and activities for each session. All leaders and assistants were also provided with materials from the manual for each session. Following training, most trained clinicians were deemed ready to begin working in the groups, which was further assessed through fidelity of administration for clinicians completed in both the caregiver and child groups. More information regarding fidelity is described below. Groups were supervised by an advanced graduate student clinician and licensed clinical psychologist.

Additionally, each group session included specific targets/lessons, which included: listening to and following directions, asking for and using friends' names, greeting friends, sharing and giving turns to friends, asking for turns during play, keeping cool when upset during play, being flexible and cooperative during play, being a good sport, sustaining play through commenting, asking friends to play, joining ongoing games, transitioning to new play activities, asking for help and helping friends, and maintaining appropriate body boundaries. During each session, children were taught fundamental social skills through a live puppet show, followed by activities designed to rehearse newly learned skills and reinforce skill development in a naturalistic setting. Simultaneously, caregivers were engaged in an hour-long group in which they were taught specific skills as to how to help their children make and keep friends. Following these separate groups, the last 30 minutes of each group session were devoted to caregiver-coached play. These caregiver social-coaching sessions consisted of in-vivo performance feedback from the treatment team while caregivers provided social coaching to their children during play-based activities with other group members (e.g., in-group playdates).

Measures

Diagnostic and Screening Measures (to determine inclusion and exclusion criteria):

Autism Diagnostic Observation Schedule, Second Edition (ADOS-2; Lord et al., 2012). The ADOS-2 (see Appendix B) is a semi-structured, observational assessment of ASD characteristics and is considered to be one of the gold standard tools used to assess social communicative and repetitive behaviors in children suspected of having ASD. The ADOS-2 consists of multiple modules, which are determined by age and language ability. For this study, Modules 2 and 3 were employed. Module 2 provides an assessment of children with little or phrase speech, consisting of a series of structured and unstructured situations that allow for the observation of spontaneous social communicative behaviors. Module 3 is designed for children with fluent speech, which includes similar tasks. The ADOS-2 demonstrates moderate to high levels of internal consistency, moderate test-retest reliability, and acceptable interrater reliability, as well as comparable or higher sensitivity and specificity as compared to the first edition of the ADOS (McCrimmon & Rostad, 2014). For the current study, this assessment was administered at entry/pre-treatment to verify that each child met ASD criteria.

Kaufman Brief Intelligence Test (KBIT-2; Kaufman & Kaufman, 2004). The KBIT-2 (see Appendix C) is an abbreviated measure of general intelligence abilities. The KBIT-2 provides Verbal and Non-Verbal Intelligence scores, as well as a composite Intelligence Quotient (IQ) score and percentile ranks by age. This assessment is appropriate for ages 4 to 90 years old, and can be completed in 15-20 minutes. The KBIT-2's IQ Composite internal consistency coefficient was found to be .93 across ages (.89 to .96), with reliabilities increasing with age. The Verbal (.91) and Nonverbal (.88) coefficients are somewhat lower, though within acceptable ranges, although the Nonverbal scale coefficients are only .78 at ages 4 and 5 (Kaufman & Kaufman, 2004). For the current study, this assessment was administered at entry/pre-treatment to verify that each child met inclusion criteria.

Demographic Questionnaire. This questionnaire (see Appendix D) includes general information such as caregiver education, family history, family composition (e.g., number of siblings, structure of family at home), and the child's developmental and medical history. Additionally, this form included tracking other treatments in which the child was participating at the time of intake, other diagnoses, and any medications.

Vineland Adaptive Behavior Scale – Third Edition (VABS-3; Sparrow, Balla, Cicchetti, & Doll, 2005). The VABS-3 (see Appendix E) Parent/Caregiver Form is a semi-structured form to assess adaptive functioning in Communication, Socialization, Daily Living Skills, and Motor Skills domains. Age equivalent scores and standard scores are obtained for each domain. This was used to determine the child's adaptive functioning overall during the entry/pre-treatment visit, specifically if they were able to participate in group activities and were toilet trained, both inclusion criteria. In the current study, the Cronbach's alpha for the total score of Adaptive Functioning was .82, .89 for the Socialization domain, .77 for the Daily Living Skills domain, and .62 for the Communication domain (likely lower on this domain due to inclusion of a writing subdomain and the varied ages of the participating children).

Primary Outcome Measures for Hypothesis Testing (organized by hypothesis):

1) Social Skills

a) ***Social Skills Monitoring (SSM).*** Progress monitoring forms (see Appendix F), consisting of 28 questions, were completed by caregivers at each session, as well as during the baseline period, at entry/pre-treatment, midpoint (Session 8), exit/post-treatment, and at follow-up. This tool was used to track skill acquisition and improvement in child social-based behaviors over the course of treatment by asking caregivers to rate their child's ability on a Likert-scale ranging from 1 to 4, with lower numbers indicating less skillful ability and higher numbers indicating more skillful ability. This provided helpful insight on the week-to-week and overall improvements of the participants. Caregivers also rated their own confidence in handing specific behaviors as well as their own stress, which is described in more detail below. For social skills, specifically, the Social Skills domain (which included 18 questions) was examined. These questions were based on skills taught each week (as outlined in session content above), how often they practiced skills at home, and how proficient the child was in completing each skill using the 1 to 4 point Likert scale. The Social Skills domain total score was calculated by adding all item ratings (e.g., from 1 to 4) included in the 18 questions. Totals were calculated each week, as well as at the timepoints specified above. Means for the Social Skills domain at the four main timepoints (e.g., not weekly) are reported in Tables 3-6. Group means for weekly completion for the Social Skills domain were analyzed for each group in SMA analyses as well as for the baseline period, which will be discussed in the results section. Cronbach's alphas for the current study were .43 for entry/pre-treatment, .95 for midpoint (Session 8), .86 for exit/post-treatment, and .87 for follow-up.

b) ***Social Responsiveness Scale, 2nd Edition (SRS-2; Constantino & Gruber, 2012).*** The SRS-2 (see Appendix G) is a 65-item questionnaire that provides a measure of traits and symptoms that distinguish behavior indicative of ASD from other variations in behavior. This quantitative measure of the severity of ASD traits gives a rating from normal to autistic disorder. Each question is rated from 1 to 4, with 1 meaning "not true" and 4 indicating "almost always true." Questions focus on the child's behavior in the last 6 months. This time range was modified at midpoint (Session 8), exit/post-treatment, and follow-up to only include the behaviors observed since the last administration of this measure. Subscales include Social Awareness, Social Cognition, Social Communication, Social Motivation, and Restricted Interests and Repetitive Behavior (Grzadzinski et al., 2011). One recent study conducting exploratory and confirmatory factor analysis examining how the SRS-2 maps onto the two main domains in the DSM-5, social communicative impairment (SCI) and restricted repetitive behaviors (RRB), found a number of subdomains that do not clearly map onto these two areas (Frazier et al., 2013). The total score used here includes both the SCI and RRB scores. Other subscales were used for exploratory analyses in the present study.

Total scores of 59 and below capture the average range; scores of 60 to 65 correspond to a mild degree of impairment; scores of 66 to 75 correspond to a moderate degree of impairment, and scores of 76 or higher correspond to a severe degree of impairment. Different versions of the SRS-2 are available based on age. In the current study, the preschool version was used for those children up to 4.5 (three participants) and the school-age version was used for all older participants (12 participants). This measure was administered at entry/pre-treatment, midpoint (Session 8), exit/post-treatment, and follow-up. Constantino and Gruber (2012) report an overall internal consistency (coefficient alpha) of .95. For the current study, total scores were used to determine child social skills. For this sample, Cronbach's alpha for the total score at entry/pre-treatment was .94, .97 at midpoint (Session 8), .92 at exit/post-treatment, and .95 at follow-up. Subscale reliabilities during each timepoint ranged from .44 to .91 (see Tables 3–6 for means).

Social Skills Improvement System (SSIS; Gresham & Elliot, 2008). The SSIS Rating Scales (see Appendix H) are available in three versions (parent, teacher, and student) and three age ranges (3-5, 5-12, 12-18). For this study, we only examined the parent version for the 4-5 year old participants and the 5-12 year old version for the 6 and 7 year old participants. The SSIS includes a Social Skills Scale comprised of seven subscales (Communication, Cooperation, Assertion, Responsibility, Empathy, Engagement, and Self-Control), a Problem Behaviors Scale comprised of five subscales (Externalizing, Bullying, Hyperactivity/Inattention, Internalizing, and Autism Spectrum), and a nine-item Academic Competence Scale (teacher version only). Reliability has been established from previous studies, specifically looking at the Social Skills Scale on the parent form with a Cronbach's alpha of .95, test-retest score of .84, and interrater reliability of .68 (Gresham & Elliot, 2008). Validity has also been established. This measure was administered at entry/pre-treatment, midpoint (Session 8), exit/post-treatment, and follow-up. Only the Social Skills Scale was examined for the present study. For this sample, Cronbach's alphas for the Social Skills Scale were .77 at entry/pre-treatment, .73 at midpoint (Session 8), .84 at exit/post-treatment, and .76 at follow-up (see Tables 3–6 for means).

The Quality of Play Questionnaire (QPQ; Frankel & Mintz 2008). The QPQ (see Appendix I) consists of 12 items administered to caregivers to assess the frequency of get-togethers with peers over the previous month and the level of conflict during these get-togethers. The 10 items which make up the Conflict Scale ask for individual ratings of peer conflict (e.g., ‘‘criticized or teased each other’’). The last two items ask caregivers to individually estimate the number of invited and hosted get-togethers the child has had over the previous month. This measure was administered at entry/pre-treatment, midpoint (Session 8), exit/post-treatment, and follow-up. Only the Conflict Scale was examined for the present study. Cronbach's alphas for the present study for the Conflict Scale was .86 at entry/pre-treatment, .81 at midpoint (Session 8), .76 at exit/post-treatment, and .74 at follow-up.

2) Caregiver efficacy and behavior

a) ***Social Skills Monitoring (SSM).*** Along with monitoring social skills, caregiver confidence in social coaching their children and caregiver stress were also recorded on this measure (see Appendix F). This form was completed by caregivers each week, as well as at entry/pre-treatment, midpoint (Session 8), exit/post-treatment, and follow-up. Caregivers were asked to rate their confidence and stress on a Likert-scale ranging from 1 to 4, with lower numbers indicating less confidence and more stress and higher numbers indicating more confidence and less stress. Scores were recorded each week, as well as at the timepoints specified above. Means for these questions at the four main timepoints (e.g., not weekly) are reported in Tables 3-6 for all individuals. Since these items were captured based on one question (e.g., confidence based on one rating each week and stress based on one rating each week) and often were not completed by caregivers, Cronbach's alphas are not reported and results should be interpreted with caution. Specific weekly means for each group were also calculated (as indicated in SMA analyses).

b) ***Parental Self-Efficacy in the Management of Asperger Syndrome (PSEMAS; Sofronoff &Farbotko, 2002).*** The PSEMAS scale (see Appendix J) is a 15-item questionnaire that was developed to assess parental self-efficacy (PSE) in a study of Parent Management Training with children with Asperger Syndrome. This questionnaire assesses the behaviors children display and the extent to which caregivers feel they can handle them. The total self-efficacy score is determined by the total confidence score for behaviors that occur divided by the total number of behaviors. The measure was only used in the original study, as well as in another study, though reliability and validity were not determined in either study. This second measure of PSE was chosen because it is specific to efficacy in caregivers of children with ASD. This measure was administered at entry/pre-treatment, midpoint (Session 8), exit/post-treatment, and follow-up. In the current study, Cronbach's alphas for the total score were .97 at entry/pre-treatment, .90 at midpoint, .85 at exit/post-treatment, and .88 at follow-up.

c) ***The Maternal Behavioral Rating Scale (MBRS; Mahoney, Powell, & Finger, 1986).*** The MBRS (See Appendix K) assesses four dimensions of parenting: responsiveness (RCO; 3 questions; responsivity to child, sensitivity, effectiveness in engaging child in play interaction), affect/animation (AA; 5 questions; acceptance, enjoyment, expressiveness, inventiveness, warmth); achievement orientation (AO; 2 questions; focus on child's development, use of praise), and directiveness (DR; 2 questions; how much caregiver tries to direct child's behavior or follows their lead, pace), based on 12 questions, each rated on a 5-point Likert scale. Generally higher codes indicate more positive parenting styles, though some scales vary (see coding specifics in Appendix K). The interaction is coded during the first 5-minutes of a caregiver-child activity in which the caregiver and child were presented with a basket of age-appropriate toys and instructed to "play as you usually engage at home." However, this interaction takes place in the laboratory. No other directions were given. Coding involved two research assistants (RAs) who achieved 80% reliability on coding and this was administered at entry/pre-treatment, midpoint (Session 8), exit/post-treatment, and follow-up.

Two RAs completed the coding of the caregiver-child interaction tasks using the coding system developed by Mahoney, Powell, & Finger (1986). The RAs trained in the global coding system and coded caregiver-child interactions from a previous study to achieve 85% rate absolute reliability before coding the videos from the current study. Each RA coded approximately two-thirds of the videos (i.e., RA1 coded 20 videos, RA2 coded 20 videos) and 19 were double coded (ICC = .90). Scores from the overlapping videos were averaged for the final coding responses used in the analyses.

Parenting Scale (PS; Arnold, 1993). The PS (see Appendix L) is a 30-item measure of parenting style that indicates a total score of parenting style and also separates dysfunctional parenting into three styles: laxness (permissive, inconsistent), overreactivity (harsh, authoritarian, irritability and displays of anger), and verbosity (over reliance on talking). Caregivers respond on a 7-point Likert scale, representing two extremes in a particular parental behavior. This was measured weekly, as well as during the baseline period, at entry/pre-treatment, midpoint (Session 8), exit/post-treatment, and at follow-up. The total score was mainly examined for analyses, and subscales indicating different parenting styles were examined for exploratory analyses. In the current study, Cronbach's alphas for the total score were .87 at entry/pre-treatment, .91 at midpoint (Session 8), .90 at exit/post-treatment, and .77 at follow-up.

3) Family Functioning

a) ***Confusion, Hubbub, and Order Scale (CHAOS; Matheny, Wachs, Ludwig, & Phillips, 1995).*** CHAOS (see Appendix M) is a 15-item, caregiver-report measure assessing environmental confusion in the home. Items are presented on a 6-point Likert scale from ''Strongly Agree'' to ''Strongly Disagree,'' with higher scores indicating greater reported family chaos. This was measured weekly, as well as during the baseline period, at entry/pre-treatment, midpoint (Session 8), exit/post-treatment, and at follow-up. In the current study, the Cronbach's alphas for the total score were .52 at entry, -1.91 at midpoint (Session 8), .44 at exit/post treatment, and .44 at follow-up. The negative value is likely due to a negative average covariance among items, which is more negative than total values. All items were checked to ensure coding was done and entered correctly.

Fidelity of implementation. Each treatment session was rated by an observer to assess for therapist fidelity of treatment implementation after each group session for both the caregiver and child groups (see Appendix N and O). Fidelity was assessed on completion of specific session goals, therapist behavior, and therapeutic relationship. Raters noted an average of 4-5 on specific items (Likert scale from 0-5 on success of implementation across all groups, with 5 being the highest score of implementation). Groups did not vary in fidelity (the last session was excluded as it was graduation and a party in addition to some review of materials covered).

Analytic Plan

Data were first analyzed to determine that the necessary assumptions of normality, linearity, and homoscedasticity were met before proceeding. Next, descriptive statistics including the means, standard deviations, and ranges were determined for the variables of interest (see Tables 1-7).

A nonconcurrent multiple baseline design allowed the analysis of changes in caregiver and child variables from baseline to post-treatment and follow-up, including child social skills and caregiver efficacy, as well as caregiver-child interaction styles and family functioning. The following set of analyses were conducted and repeated for each hypothesis.

Nonparametric Friedman tests were employed, followed by post-hoc Wilcoxon tests for pre–post comparisons, as well as examination of follow-up data. To calculate effect size, the following formula was used ($r = Z/\text{sqrt}(N)$). The interpretation of effect sizes (r values) are as follows: .5 = large effect, .3 = medium effect, .1 = small effect (Fritz, Morris, & Richler, 2012). A sample size of 27 would have been necessary to detect a large effect ($r = .5$) and 648 for a small effect (r = .1). Thus, the results here are under-powered and should be interpreted cautiously.

Single-Subject Analyses.

A reliable change index (RCI) was calculated to determine social skills, caregiver confidence and knowledge, and family functioning change relative to measurement error for each individual. RCIs were calculated to determine the magnitude of change needed to show meaningful change above and beyond standard error. RCI calculations were completed by dividing the difference of scores between two timepoints (i.e., either entry/pre-treatment and exit/post-treatment or entry/pretreatment and follow-up), divided by the standard difference, which includes test-retest reliability and standard deviation of the original measure. RCI values above 1.96 are suggested to infer statistically significant and meaningful change. The test-retest reliabilities and standard deviations used to compute the S_{diff} score were obtained from the literature. If test-retest reliability was not previously reported in literature, then Cronbach's alpha was used (from the literature). In looking at individual change, we were only able to calculate RCIs for validated measures. Thus, some measures are not included in these analyses. A method for calculating "clinical significance" was used (Jacobson & Truax, 1991). This method examines a change of two standard deviations from the entry/pretreatment mean as a cutoff for "recovery" at exit/post-treatment.

Finally, Simulation Modeling Analysis (SMA; Borckardt et al., 2008) was employed for the analysis of single-case data (with each treatment group represented as a single-case). SMA allows the user to examine changes in the level of symptoms and the slope of symptom change and evaluates the significance of the effect using bootstrapping methods to create simulations that take the phase lengths and autocorrelation of data into account (which results in a high rate of Type I errors), since repeated measure administration results in subsequent administrations being dependent on the value of the previous administrations. Thus, by accounting for autocorrelation, SMA techniques reduce the likelihood of false positive findings. SMA tests the data stream for participants individually against five slope vectors: 1) an increasing baseline and decreasing treatment [| 1 | 2 | 3| 3 | 2 | 1 | 0 | -1 | -2 | -3 | - 4 | -5 | -6 | -7 | -8 | -9 | -10 | -11 | -12]; 2) a flat baseline and increasing treatment [| 0 | 0 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14

| 15 | 16 | 17 | 18 |]; 3) an increasing baseline and flat treatment [| 1 | 2 | 3 | 4 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |]; 4) increasing from baseline throughout treatment [| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |]; and 5) increasing during treatment, return to pre-treatment level at the initiation of treatment, and then increasing throughout treatment [| 1 | 2 | 3 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9| 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |]. In addition, SMA tests for level change, which is a significant change between baseline and treatment [| 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |]. The significance value determines the likelihood that the outcome would occur by chance based on the Pearson correlation between the participant data and the dummy coded level change vector (above; 0 = baseline, 1 = treatment). In addition, exit/post-treatment and follow-up data were included in the treatment phase. All slope patterns are presented in Figure 2. In determining whether a slope of a group's data 'matches' a particular vector slope, SMA allows for both autocorrelation and calculation of the correlation of the outcome measure and phase vector. The probability of potential effect sizes' occurrence by chance in null findings is also calculated.

Further, multivariate process change or the temporal relationship between two variables (e.g., do social skills improve before parenting style?) was also explored. This form of SMA allows for examination of cross-lagged correlations between two variables of interest in order to determine potential processes of change on variables. Per Borckardt and colleagues' (2008) recommendation that each phase have between 5-15 data points per phase (baseline and treatment), the baseline phase for Groups 2 and 3 for all three measures should be interpreted with caution (as noted above for specifics regarding baseline periods). In addition, all groups had 16 data points for therapy sessions, other than Group 2, which had 15 data points due to severe weather which necessitated that two sessions be combined.

Chapter 3 – Results

Preliminary Analyses

Data were first analyzed to determine that the necessary assumptions of normality, linearity, and homoscedasticity were met before proceeding. Due to the non-normal distribution of the data, non-parametric tests were used. As mentioned above, groups were compared based on demographic information and no differences were indicated, thus, data were collapsed for most analyses. Next, descriptive statistics including the means, standard deviations, and ranges were determined for demographic variables (Table 1) as well as totals for categorical variables (Table 2).

Therapist fidelity of treatment implementation. Throughout the course of these four groups, each session was rated and assessed on completion of specific session goals, therapist behavior, and therapeutic relationship. Groups did not vary in fidelity (last session was excluded as it was graduation and a party in addition to some review of materials covered). Per observer ratings across all groups, all sessions were rated to complete 90 -100% of outlined components, other than one group where 75% of outlined components were completed due to starting late and being short on time. This was identified as an outlier and not included in analyses (*Mchild group* = 99.37, *SDchild group* = 2.06; *Mcaregiver group* = 99.63, *SDcaregiver group* = 1.84). Raters noted success of implementation across all groups, with 5 being the highest implementation score of specific items (Likert scale from 0 – 5; *Mchild group* = 4.89, *SDchild group* = .20; *Mcaregiver group* = 4.92, *SDcaregiver group* = .18).

Treatment Efficacy: Primary Outcome Measures

Comparisons across time (non-parametric Friedman and Wilcoxon Rank)

Social skills. Data were first analyzed to determine if there were changes across time regarding social skills, using Friedman tests, followed by further testing across timepoints using the Wilcoxon Signed Rank test. All Friedman results are listed in Table 7. On the SSM, looking at the Social Skills domain (which includes the total for items relating to social skills, frequency, and severity of behavior based on caregiver report), Friedman tests revealed significant changes across the four timepoints ($x^2(3) = 13.603$, $p = .003$). Post hoc Wilcoxon tests revealed significant differences from entry/pre-treatment to exit ($Z = -2.37$, $p = .018$, $r = .89$), from entry/pre-treatment to follow-up ($Z = -2.67$, $p = .008$, $r = .89$), from midpoint to exit/post-treatment ($Z = -2.38$, $p = .02$, $r = .89$), and from midpoint to follow-up ($Z = -2.05$, $p = .040$, $r = .59$), all considered large effect sizes. There were not significant differences from entry/pre-treatment to midpoint ($Z = -1.82$, $p = .066$, $r = .61$) or from exit/post-treatment to follow-up ($Z = -496$, $p = .620$, $r = .30$).

On the SRS-2, though there were no significant differences on the Total Score overall, there were significant improvements in social skills on the Social Communication Index (SCI) total, which captures the socially-based total without Restricted and Repetitive Behaviors (RRB) on all four timepoints ($x^2(3) = 8.39$; $p = .039$). Wilcoxon tests revealed significant differences on the SCI scale between entry/pre-treatment and midpoint ($Z = -2.076$, $p = .038$, $r = .56$) and entry/pre-treatment to follow up ($Z = -2.59$, $p = .010$, $r = .69$). All subscales of the SRS-2 were also examined. Friedman tests were also significant for the Social Communication domain ($x^2(3) = 7.77$; $p = .051$), though not on the other subscales. Other scales that revealed significant differences on Wilcoxon tests were Total SRS-2 score from entry/pre-treatment and follow-up ($Z = -2.043$, $p = .041$, $r = .55$), Social Cognition subscale between entry/pre-treatment and midpoint ($Z = -1.99$, $p = .046$, $r = .53$) and entry/pre-treatment and follow-up ($Z = -2.59$, $p = .010$, $r = .69$), Social Communication subscale between entry/pre-treatment and follow-up ($Z = -2.073$, $p = .038$, $r = .55$), and the Social Motivation subscale between entry/pre-treatment and midpoint ($Z =$

-1.95, p = .051, r = .52) and entry/pre-treatment and follow-up (Z = -2.613, p = .009, r = .70). These are all large effect sizes and the negative scores suggest that these scores improved (i.e., decrease in social deficits).

On the SSIS Social Skills domain, there were improvements across all four timepoints ($x^2(3) = 8.31$; p = .040) and Wilcoxon Rank tests revealed significant differences on this scale between entry/pre-treatment and midpoint (Z = -2.41, p = .016, r = .90), entry/pre-treatment to follow-up (Z = -2.51, p = .012, r = .84), midpoint to exit/post-treatment (Z = -2.80, p = .005, r = .94), and exit/post-treatment to follow-up (Z = -2.56, p = .011, r = .85), all of which are large effect sizes.

On the QPQ conflict scale, there were no significant changes across all four timepoints ($x^2(3) = 3.24$; p = .36). On the Wilcoxon tests, there were significant differences between the conflict score from midpoint to follow-up (Z = -2.27, p = .023, r = .17), which is a small effect size. For other timepoints, significance values ranged from .23 to .78, with mostly large effect sizes, though one finding indicated a small effect size.

Caregiver efficacy and behavior. Examining the second hypothesis, looking at caregiver efficacy and behavior, on SSM measures of confidence ($x^2(3) = 6.00$, p = .112) and stress ($x^2(3) = 2.053$, p = .56), there were no overall significant changes over time. Of note, fewer caregivers completed these questions at all timepoints. No significant changes in stress or confidence were indicated, though caregiver stress did slightly increase (see means Table 3-Table 6).

On the PSEMAS, total self-efficacy was not significant overall ($x^2(3) = 7.58$, p = .055), though differences were significant between entry/pre-treatment and midpoint (Z = -2.48, p = .013, r = .029) and entry/pre-treatment to follow-up (Z = -2.23, p = .026, r = .23). These are both small and medium effect sizes, respectively.

On the MBRS, significant changes across all four timepoints were indicated on the AO code ($x^2(3) = 7.97$, $p = .047$). Further analyses indicated differences on AO from entry/pre-treatment to midpoint ($Z = -2.00$, $p = .046$, $r = .52$) and entry/pre-treatment to follow-up ($Z = -2.39$, $p = .017$, $r = .62$) and on AA from midpoint to exit/post-treatment ($Z = -2.501$, $p = .012$, $r = .67$). These all indicate large effect sizes. No other subscales revealed significant differences.

On the PS scale, though the total score is the scale of interest, this was not significant. For exploratory analyses, the other three subscales (i.e., overreactivity, laxness, and verbosity) were examined. Only the overreactivity scale showed significant change overall for all four timepoints ($x^2(3) = 11.8$, $p = .008$). Wilcoxon tests indicated PS total score was significant from entry/pre-treatment to midpoint ($Z = -2.25$, $p = .024$, $r = .75$) and from entry/pre-treatment to follow-up ($Z = -2.045$, $p = .041$, $r = .62$), laxness was significant from entry/pre-treatment to midpoint ($Z = -2.016$, $p = .044$, $r = .67$), and overreactivity was significant from entry/pre-treatment to midpoint ($Z = -2.20$, $p = .028$, $r = .73$) and from entry/pre-treatment to exit/post-treatment ($Z = -2.39$, $p = .017$, $r = .84$). These were all large effect sizes. No timepoints were significant for verbosity.

Family Functioning

No significant change in CHAOS scores across all four timepoints ($x^2(3) = 2.02$, $p = .57$) was indicated and there were also no significant differences when comparing specific timepoints. This score remained relatively stable.

Individual Outcomes.

In looking at individual change at a significant level, only RCIs for validated measures could be calculated. Thus, some measures are not included in these analyses (i.e., SSM). We also used the clinical outcomes approach proposed by Jacobson and Truax (1991) for analyzing single-case data in determining recovery. See Table 8 for values. For all of these calculations, results were based on those who completed measures at the specified timepoints (e.g., entry/pre-treatment, exit/post-treatment, follow-up). Further, while some scores were negative (indicating that scores decreased, which suggests improvement), others were positive (indicating that scores increased). These vary based on measure and are outlined in the measures section. Additionally, individuals who significantly demonstrated decreased confidence, were not considered to have improved.

Social skills. Since the SSM has not been validated, this measure was not able to be examined for these analyses.

On the SRS-2, while no individuals were noted to significantly improve on the total score from entry/pre-treatment to exit/post-treatment, 7.14% individuals improved from entry/pre-treatment to follow-up (1 out of 14 children), 20% of those who completed measures at entry/pre-treatment and exit/post-treatment were indicated to have improved on SCI (2 out of 10 children), and 21.43% from entry/pre-treatment to follow-up (3 out of 14 children). On the RRB subscale, 20% were indicated to improve from entry/pre-treatment to exit/post-treatment (2 out of 10 children), while 28.57% were indicated to have significantly improved from entry/pre-treatment to follow-up (4 out of 14 children). On the Social Awareness subscale, 40% significantly improved from entry/pre-treatment to exit/post-treatment (4 out of 10 children) and 35.71% from entry/pre-treatment to follow-up (5 out of 14 children). On the Social Cognition subscale, 20% significantly improved from entry/pre-treatment to exit/post-treatment (2 out of 10 children) and 35.71% from entry/pre-treatment to follow-up (5 out of 14 children). On the Social Motivation subscale, 40% significantly improved from entry/pre-treatment to exit/post-treatment (4 out of 10 children), while 57.14% improved from entry/pre-treatment to follow-up (8 out of 14 children). Finally, on the Social Communication domain, 10% significantly improved from entry/pre-treatment to exit/post-treatment (1 out of 10 children), while 28.57% significantly improved from entry/pre-treatment to follow-up (4 out of 14 children). No individuals were indicated to have recovered on either the total score or subscale of the SRS-2.

On the SSIS Social Skills domain, 50% were indicated to have significantly improved from entry/pre-treatment to exit/post-treatment (5 out of 10 children) and 50% maintained or showed these improvements at follow-up (7 out of 14 children). No individuals were indicated to have recovered on the SSIS Social Skills domain.

On the QPQ, 71.42% of children (5 out of 7 children) significantly improved from entry/pre-treatment to exit/post-treatment, while 80% significantly improved from entry/pre-treatment to follow-up (8 out of 10 children). No individuals recovered.

Caregiver efficacy and behavior. The same is true for the SSM description as above in that analyses including these measures of confidence and stress were not included. However, on the PSEMAS total self-efficacy score, 30% of caregivers indicated that they significantly improved from entry/pre-treatment to exit/post-treatment (3 out of 10 caregivers), while 50% did at follow-up (7 out of 14 caregivers). No caregivers were indicated to have recovered on the PSEMAS.

On the MBRS, 21.42% significantly improved on the RCO scale from entry/pre-treatment to exit (3 out of 14 caregivers) and 13.33% significantly improved from entry/pre-treatment to follow-up (2 out of 15 caregivers). On the AA scale, 7.14% improved from entry/pre-treatment to exit/post-treatment (1 out of 14 caregivers) and 6.67% significantly improved from entry/pre-treatment to follow-up (1 out of 15 caregivers). Further, on the AO scale, 21.43% of caregivers significantly improved from entry/pre-treatment to exit/post-treatment (3 out of 14), while 40% of caregivers significantly improved from entry/pre-treatment to follow-up (6 out of 15). Finally, on the DR scale, 35.71% significantly improved from entry/pre-treatment to exit/post-treatment (5 out of 14 caregivers) and 33.33% from entry/pre-treatment to follow-up (5 out of 15 caregivers). Regarding recovery, 7.14% of caregivers were indicated to have recovered on the AO subscale of the MBRS from entry/pre-treatment to exit/post-treatment. These results were not maintained at follow-up (see Table 8).

On the PS scale, only the total scale was reviewed for individual improvement and recovery. 22.22% of caregivers were indicated to have improved from entry/pre-treatment to exit/post-treatment on the total scale (2 out of 9 caregivers) and 9.10% significantly improved from entry/pre-treatment to follow-up (1 out of 11 caregivers). 10% of caregivers were indicated to have recovered from entry/pre-treatment to exit/post-treatment.

Family functioning

On the CHAOS scale, 11.11% of caregivers indicated that the level of family functioning significantly improved from entry/pre-treatment to exit/post-treatment (1 out of 9), while 18.18% of caregivers indicated that the level of family functioning significantly improved from entry/pre-treatment to follow-up (2 out of 11). No individuals indicated family chaos recovered on the CHAOS scale.

Multivariate Analyses (SMA).

Finally, SMA was utilized to detect significant changes in mean scores between the baseline and treatment phases for the SSM Social Skills domain, PS total score, and CHAOS total score. These analyses detect overall change and potential mechanisms of change during treatment. Each group is presented as a single case, reflecting the means. All graphical representations of results are presented in Figures 3-5, which display results over baseline, treatment, exit/post-treatment, and follow-up, the last three of which are all included in the same phase. Again, as Borckardt et al. (2008) recommends between 5-15 data points for each data phase, the current results should be interpreted with caution for Groups 2 and 3. All group mean scores on each measure are represented together in Figures 6-8.

Social Skills. Though mean changes were only observed for Group 3 (*r* = .53; *p* = .035), all results are indicated in Table 9. Significant changes were observed in slope analysis, where the pattern of scores for the SSM Social Skills domain was tested against the previously mentioned slope vectors. Table 10 presents the highest correlation slopes for each case, and Figures 3 displays all data points/slopes for each group. For the SSM Social Skills domain, all groups demonstrated significant slopes for slopes 2 (flat baseline and increasing treatment), 4 (increasing from baseline throughout treatment), and 5 (increasing during baseline, return to pre-treatment level at initiation of treatment, then increasing throughout treatment). Groups 1, 2, and 3 demonstrated significant slopes for slope 1 (increasing baseline and decreasing treatment), and only Group 3 demonstrated a significant slope on slope 3 (increasing baseline and flat treatment). Complete values are indicated in Table 10.

Caregiver efficacy and behavior. Though mean changes were only observed for Group 4 on the PS total score (*r* = -0.60; *p* = .017), all results are indicated in Table 9. Significant changes were observed in slope analysis, where the pattern of scores for the PS total score was tested against the previously mentioned slope vectors. Table 10 presents the highest correlation slopes for each case and Figure 4 displays all data points/slopes for each group. For the PS, only Group 4 demonstrated significant slopes for slope 2 (flat baseline and increasing treatment), 3 (increasing baseline and flat treatment), 4 (increasing from baseline throughout treatment), and 5 (increasing during baseline, return to pre-treatment level at initiation of treatment, then increasing throughout treatment). Group 1 demonstrated the closest significant slope to slope 1 (increasing baseline and decreasing treatment); while Groups 2 and 3 demonstrated the closest significant slope to slope 5 (increasing during baseline, return to pre-treatment level at initiation of treatment, then increasing throughout treatment). Complete values are indicated in Table 10.

Family functioning. Mean changes were not observed across any groups (all results in Table 9), and no slopes were identified as significant when tested against the previously mentioned slope vectors (Table 10). Figure 5 displays all data point/slopes for each group. Group 1 demonstrated the closest significant slope to slope 1 (increasing baseline and decreasing treatment); while Groups 2 and 4 demonstrated the closest significant slope to slope 4 (increasing from baseline throughout treatment). Group 2 demonstrated the closest significant slope to slope 3 (increasing baseline and flat treatment). Complete values are indicated in Table 10.

Multivariate process analysis was also implemented in SMA, which allowed for the temporal analysis of the SSM Social Skills domain, PS total score, and CHAOS total scale. Table 11 presents significant lags. For the analysis of the SSM Social Skills domain leading to PS total score, Group 1, Group 2, and Group 3 had significant positive correlations at Lags -3 and -2. Group 3 also had significant positive correlations at Lags -1 and 0. For the lags at -3, -2, and -1, this indicates that either a 1) decrease in the PS total score occurred before a decrease in the SSM Social Skills domain by 3, 2, or 1 week(s) at one of the lags; 2) an increase in the PS total score occurred before an increase in the SSM Social Skills domain by 3, 2, or 1 week(s) at one of the lags; or, 3) both occurred. For the Lag at 0 for Group 3, this indicates that either 1) increases in the SSM Social Skills domain and PS total score occurred concurrently at one of the lags; 2) decreases in the SSM Social Skills domain and PS total score occurred concurrently; or, 3) both occurred.

For the analysis comparing SSM Social Skills domain to the CHAOS total score, Group 1 and Group 2 demonstrated significant positive correlations at Lags -3 and -2 and Group 3 demonstrated significant positive correlations at Lags -3, -2, -1, 0, and 1. This indicates that 1) a decrease in the CHAOS total score occurred before a decrease in the SSM Social Skills domain by 3, 2, or 1 week(s) at one of the lags; 2) an increase in the CHAOS total score occurred before an increase in the SSM Social Skills domain by 3, 2, or 1 week(s) at one of the lags; or, 3) both occurred. For the Lag at 0 for Group 3, this indicates that 1) increases in the SSM Social Skills domain and CHAOS total score occurred concurrently at one of the lags; 2) decreases in the SSM Social Skills domain and CHAOS total score occurred concurrently; or, 3) both occurred. Finally, for the Lag at 1 for Group 3, this suggests that 1) a decrease in the SSM Social Skills domain occurred before a decrease in the CHAOS total score by 1 week; 2) an increase in the SSM Social Skills domain occurred before an increase in the CHAOS total score by 1 week; or, 3) both occurred.

For the analysis of PS total score to SSM Social Skills domain, Group 1 demonstrated significant positive lags at Lags -3 and -2, and Group 4 also demonstrated a negative lag at Lag -2. For the analysis of PS total score to CHAOS total score, only Group 1 demonstrated a significant positive lag at -3 and -2. These results indicate that either 1) a decrease in the SSM Social Skills domain/CHAOS total score occurred before a decrease in the PS total score by 3 or 2 weeks at one of the lags; 2) an increase in the SSM Social Skills domain/CHAOS total score occurred before an increase in the PS total score by 3 or 2 weeks at one of the lags; or, 3) both occurred.

For the analysis of CHAOS total score to SSM Social Skills domain, Group 1 demonstrated significant negative lags at -3, -2, and -1. This indicates that either 1) a decrease in the Social Skills domain occurred before a decrease in the CHAOS total score by 3, 2, or 1 week(s) at one of the lags; 2) an increase in the SSM Social Skills domain occurred before an increase in the CHAOS total score 3, 2, or 1 week(s) at one of the lags; or, 3) both occurred. Additionally, Group 2 indicated a significant negative lag at 0. This indicates that either 1) increases in the CHAOS total score and SSM Social Skills domain occurred concurrently at one of the lags; 2) decreases in the CHAOS total score and SSM Social Skills domain occurred concurrently; or, 3) both occurred.

For the analysis of CHAOS total score to PS total score, Group 1 demonstrated a significant negative lag at -3, -2, and -1, Group 2 demonstrated a positive correlation at Lag 0, and Group 4 showed a negative correlation at Lag -2. Finding at Lags -3, -2, and -1 suggest that: 1) an increase in the PS total score occurred before an increase in the CHAOS total score by 3, 2, or 1 week(s) at one of the lags; 2) a decrease in the PS total score occurred before a decrease in the CHAOS total score by 3, 2, or 1 week(s); or, 3) both occurred. The finding at Lag 0 suggests that either 1) increases in the CHAOS total score and PS total score occurred concurrently at one of the lags; 2) decreases in the CHAOS total score and PS total score occurred concurrently; or, 3) both occurred.

Chapter 4 – Discussion

This study adds to the growing literature that suggests working on social skills is key for early intervention, as well as helping to clarify how caregiver involvement in interventions is critical. The current study examined the feasibility of a social skills intervention for 15 young children with ASD as well as their social skills improvement over the course of treatment and at follow-up, the caregiver-child relationship, caregiver confidence, and family functioning. Though results did not indicate significant differences in family functioning, results did suggest significant improvements in child social skills as well as in caregiver-child relationship aspects and in caregiver self-efficacy, all of which were maintained at a 4-6 week follow-up. Use of both an observational coding system as well as caregiver self-report adds to the robust findings of this work. Of note, the small sample size may impact the ability to detect small or medium effect sizes and therefore, results should be interpreted with caution. Generally, effect sizes in the current study were large, which may be why they were able to be detected, despite the study being under-powered. Additionally, some SMA results should be interpreted with caution if less than 5 data points are present for a given timepoint.

In examining feasibility of application of the P4P curriculum, this study supports the conclusion that this intervention is feasible to administer across various sites, as well as feasibility of employing a training beforehand to prepare group leaders. Trainings were conducted by the lead graduate student and case conferences were conducted before each group session. As indicated by the results of the fidelity measures, groups were conducted at fidelity, even without a published manual, though there was an unpublished manual with instructions and a script for each child and caregiver session provided, across sites and clinicians. This suggests promising results for continuing to offer P4P to this age group and population, which is very much in need of social skills services (DeRosier et al., 2011; Reichow & Volkmar, 2010). Further, though the intervention typically offers one session per week, due to the need to complete all 16 sessions in the allotted timeframe, 2 sessions per week were employed for each group (e.g., over 8 weeks), which also proved to be feasible and families anecdotally reported this did not pose difficulty on their family routines or functioning. No measure of satisfaction was completed by caregivers, though it could be included in future studies.

Regarding the first aim and examining the hypotheses of the study focusing on child social skills, overall, results indicated improvement in social skills over the course of the 16-session treatment, and many gains were maintained at the 4-6 week follow-up visit post-treatment. This was true for specific areas of social functioning, including on the SSM Social Skills domain, which caregivers completed weekly, and included charting the child's use of skills taught in groups, as well as frequency and intensity of social behavior. These gains were maintained at follow-up, which suggests skills taught were generalized, even after the treatment ended, as this measure was designed to capture specific skills taught in the P4P intervention. Further, the SCI total score of the SRS-2 significantly improved over the course of treatment and further examination indicated this improvement was maintained at follow-up. Specific areas that also improved on the SRS-2 included Social Cognition, Social Communication, and Social Motivation, all of which indicate improvement in social functioning, as reported by caregivers. Similar gains in social skills were indicated on the SSIS, from entry/pre-treatment to exit/post-treatment, which were maintained at follow-up. Gains in social skills were not evident on the QPQ, which specifically looks at peer relationships on playdates, which may be due to caregivers not arranging appropriate get-togethers with peers.

Overall, findings are encouraging. Since social deficits have been identified as one of the core features of ASD, and are often first evident in early childhood (Rao et al., 2008), early social skill intervention is key to giving individuals with ASD foundational skills on which to build, while navigating the social world as they continue to mature, form more friendships, and address social communication– which is often cited as a top treatment concern for children with ASD (Watkins, Kuhn, Ledbetter-Cho, Gevarter, & O'Reilly, 2017). These concerns are specifically addressed in the P4P intervention. It is possible that intervening earlier to address these social difficulties might mitigate some of these adverse results. Future research could employ longitudinal work to follow these children as they mature. Another result worth noting is the number of individuals indicated to have significantly improved, based on RCI scores, from entry/pre-treatment to completion of treatment or from entry/pre-treatment to follow-up (see results in Table 8). This suggests that improvements in social skills are long-lasting and may be maintained over time. Though no children were indicated to have recovered (which uses a cutoff of 2 standard deviations), significant improvement in domains of social skills are nonetheless apparent. Analysis using SMA suggests mean changes in one group (Group 3) from baseline to treatment, indicating a significant increase in social skills. Further, all groups demonstrated an increased slope over the course of treatment (slopes 2 and 4). Though some results suggest no change or a return to baseline (see SMA results), these positive findings are generally promising, and analyses with a larger sample size would add to these findings. This could also suggest the usefulness of including booster sessions to maintain gains after the formal treatment has been completed, as these additional sessions may prevent skills from returning to social skills at baseline.

One critical component of this study, which directly responds to the field moving towards more caregiver involvement in interventions (Dixon et al., 2004; Thompson et al., 1997), was the second area of hypotheses outlined: to examine caregiver confidence in interacting with their child, parenting style, and explore the caregiver-child relationship and interaction style over the course of treatment and at follow-up. In this study, results also indicated improvements in these domains. Though caregiver stress did not decrease, and caregiver confidence was not indicated to have increased on the SSM measure, PSE did increase from entry/pre-treatment to follow-up on the PSEMAS. This suggests that, through the course of treatment, where caregivers engaged regularly with their child and received coaching, caregivers showed an increase in PSE, which may generalize to different domains of daily functioning. While P4P specifically focused on how caregivers can serve as social coaches in play-settings, PSE captures overall confidence; a caregiver's belief in their ability to parent their child (Karst & Van Hecke, 2012). PSE has been found to predict the level of parenting competence, such that higher PSE led to more effective parenting, even when dealing with challenging behavior, in a sample of TD children and their caregivers (Jones & Prinz, 2005). Further, low levels of PSE may lead to poor persistence, depression, and less satisfaction as a caregiver (Johnston & Mash, 1989). This is an especially important concept to examine in caregivers of children with ASD, since children often do not receive a diagnosis until later in their development (4-5 years of age), even though ASD can be diagnosed as early as 2 years old (CDC, 2014). This could mean that caregivers have been employing ineffective parenting techniques for a number of years, which may have made them feel both inept and frustrated as caregivers (Karst & Van Hecke, 2012). Especially in the context of intervention, an increase in this domain is critical, as caregivers play an essential role in child improvement (the bidirectional relationship) and, therefore, engaging in an intervention where both the child and caregiver is involved may have positive impacts on both of them and on their relationship (Granger et al., 2012). Analysis using SMA indicate mean changes in one group (Group 4), from baseline to treatment, suggesting a significant increase in more positive parenting style. Additionally, results from the P4P groups suggest slope changes over the course of treatment (slopes 2, 3, 4, and 5). Though some results suggest no change or a return to baseline (see SMA results), the positive findings are generally promising and analyses with a larger sample size would add to these findings. Thus, the caregiver-coaching component in each session of P4P might have increased PSE, as this was the main caregiver domain impacted.

Additionally, on a scale that measures parenting style (PS), though the total score was not significant over time (only from entry/pre-treatment to midpoint and at follow-up), 10% of caregivers were indicated to have recovered from entry/pre-treatment to exit/post-treatment, along with a number who indicated significant improvements (RCI scores) from entry/pre-treatment to exit/post-treatment and to follow-up. Thus, less dysfunctional parenting styles were indicated over the course of this intervention, even when not specifically targeted. Improvement was also indicated on scales of overreactivity and laxness, though not on verbosity. Finally, an observational method also measured caregiver-child interaction styles (MBRS). Though not all domains were indicated to have improved, the Achievement Orientation (AO) scale indicated caregiver improvement from entry/pre-treatment to follow-up, the Animation/Affect (AA) scale also improved from entry/pre-treatment to follow-up, and some caregivers were indicated to have significantly improved on these scales (RCI scores) throughout treatment. This finding regarding caregiver-child relationship supports the notion that the inclusion of caregivers leads to a number of benefits, as they develop more positive interactional styles in engaging with their children and increased use of praise and engagement (Karst & Van Hecke, 2012). In addition, one caregiver was indicated to have recovered on the AO scale from entry/pre-treatment to exit/post-treatment, though these results were not maintained at follow-up. Therefore, inclusion of caregivers in this caregiver training program was shown to lead to positive relationship changes and how they interact with their children, even if those results were not specifically targeted. Similar results have also been shown in a systematic review of the literature (Factor, Ollendick, Cooper, Dunsmore, Rea, & Scarpa, 2019). Generalization beyond a social skills group setting might occur by including caregivers (DeRosier et al., 2011), and therefore caregivers are a critical component of intervention, while they also experience positive changes in their own PSE and parenting styles.

In exploring the last hypothesis, family functioning, results did not indicate change and remained largely stable throughout all timepoints. This was measured on only one scale of caregiver-report (CHAOS scale). However, two caregivers indicated that family chaos significantly improved, based on RCI scores, from entry/pre-treatment to exit/post-treatment and to follow-up. Therefore, there was some improvement in family functioning on an individual basis. Upon further analysis; however, one family who indicated improvement included only the target child (i.e., they are an only-child), while the other has a younger sibling. Lack of significant results might suggest that other members of the family may need to be involved in the intervention or more measures should be employed to measure family functioning. Involvement of other family members (e.g., if both parents/caregivers attended groups, alternated, sibling came) was not tracked and could be a fertile area for future studies. In addition, only one father was the target caregiver, which might also indicate changes in the overall family domain, as mothers and fathers have been indicated to respond differently to certain child behavior and PSE (Hastings & Brown, 2002). Though this contradicts other research that caregiver training programs may lead to more positive familial outcomes (Factor et al., 2019) and changes in one relationship may impact the dynamics of the larger family unit (Minuchin, 1985), the concept of family functioning should be further explored. The fact that this intervention did not increase stress on families suggests that caregiver training may require less time and strain on the caregivers, allowing them to still focus on other children or their spouse, which does support previous findings comparing trainings to caregiver-mediated interventions (Factor et al., 2019).

Cross-lag analyses looking at these various domains using the SSM Social Skills domain score, PS total score, and CHAOS total score suggest a connection between social skills, caregiver style, and family functioning. Specifically, analyses suggest a connection between all three variables, and especially between social skills and caregiver style of parenting as well as social skills and family functioning. While some of these changes occurred at different times (e.g., with social skill progress occurring before improvements in the other domains), these results reveal the intersectionality of these domains, especially in a treatment context, and that focusing on each of these domains may in fact impact gains made in the other domains. A clear pattern did not emerge in terms of temporality of the changes, thus further research is needed with a larger sample size to better understand the mechanisms of change in this treatment.

In sum, results largely support the hypotheses regarding social skills, caregiver efficacy, and caregiver-child dynamics within the context of a social skills intervention. More research is needed in this realm, as this work is a first step in employing social skills for this age group and in continuing to expand research focusing on caregivers and the family, in addition to specific child outcomes.

Limitations

Although this study presents meaningful data and results, it is not without notable limitations. Firstly, small sample sizes are a common limitation to intervention research, which can make it difficult to detect interaction effects as well as to apply various statistical analyses (Minjarez et al., 2013; Ichikawa et al., 2013). In this study, group sizes were small and did not allow for us to detect significance from medium or small effect sizes, and the results of non-large effects should therefore be interpreted with caution. The limitation regarding examining effect sizes may prevent the ability to infer information from the conclusions of this specific intervention study. Additionally, small sample size and short baselines also impacted SMA results, which should therefore be interpreted with caution. To ensure the accuracy of results as well as expand on the generalizability of results, the specified results should be tested in a larger and more racially diverse sample. Relatedly, missing data due to a lack of families completing exit/post-treatment data, especially, limited sample size. However, appropriate analyses were selected to take the sample size into consideration, such as examining individual differences, which is in fact a strength of the current study. Though this specific methodology for an open trial was taken into consideration and deemed appropriate for the current study, an RCT which employs a more rigorous study design would allow for more definitive conclusions about the efficacy of the intervention.

Generalizability of the results and intervention is another limitation. While the gender of children is largely representative of the fact that males are more likely than females to have ASD (Rivet & Matson, 2011), only one father was the target caregiver and including more fathers may have allowed for another layer of analysis to consider. Further, which family members attended each session was not recorded, which could influence results. On the same note, lack of involvement of siblings, another key part of the family unit, in the current study is a limitation.

Looking at their involvement or reflections might further demonstrate family functioning differences and insight into family dynamics in the context of P4P. Therefore, examining the distinct experiences of family members beyond the specific child with ASD in future studies related to social skill groups seems like an essential next step. Differences in SES should be further examined, as the current sample involves caregivers with a wide range of education and income. If differences based on SES are present, any necessary adaptations to the intervention (e.g., changes in information provided, timing of groups, etc.) should also be explored.

Another limitation to this area of intervention research relates to the type of outcome measures utilized, specifically caregiver-report measures (Whittingham et al., 2009). Though an observational measure was employed, most reports relied on caregiver-report, and this was the sole method for social skills and family functioning outcomes. Caregiver involvement in treatment may bias post-treatment assessment of their child's social functioning (White, Keonig, & Scahill, 2007) as well as reports of family or relationship outcomes, if caregivers believe they should respond a certain way and that belief influences their self-reported observations of child social skills. Therefore, additional observational measures could be employed to measure the other domains (e.g., social skills, family functioning). Further, the PS scale might not have accurately been employed as a measure of change for each session, as it prompts the caregiver to consider the past 2 months. In response to this consideration, another measure of parenting style might be administered in future studies.

Finally, caregiver traits were not examined and other child behavior (e.g., problem behavior) was not explored in this study. The development and heritability of ASD traits are a focus of current research, which include studying the Broader Autism Phenotype (BAP; Bolton et al., 1994) in parents and siblings of individuals with ASD (Piven, Palmer, Jacobi, Childress, &

Arndt, 1997). This subclinical category of ASD traits includes aloofness, rigidity, and pragmatic language difficulties. High levels of these traits often predict social and emotional challenges for both the family member who does not have an ASD diagnosis and for the child with an ASD diagnosis (Cruz, Camargos-Junior, & Rocha, 2013; Ingersoll & Hambrick, 2011; Maxwell, Parish-Morris, Hsin, Bush, & Schultz, 2013). Further, other child behaviors, especially problem behavior, may reasonably be expected to influence the efficacy of caregiver-child interactions and the efficacy of caregiver reinforcement of social skills interventions on a daily basis. Examining these factors either individually or together could have a significant impact in both how children perform and how caregivers respond to their children.

Future Directions

This study presents a significant step in intervention research that focuses on a social skills intervention for preschoolers with ASD and also emphasizes the experience of the caregiver and family unit. Given the current state of intervention work, which has shifted to caregivers becoming an active participant or the primary administrator of intervention, this work is especially vital (Dixon et al., 2004; Thompson et al., 1997). More work is needed to determine the efficacy of this specific intervention.

Securing P4P as an evidence-based intervention is a critical next step. Following the American Psychological Association (APA) Division 12 guidelines, evidence-based treatment status is established after two RCTs are conducted and treatments are found superior to a control group (Wong et al., 2015; Chambless & Hollon, 1998). Specific guidelines in assessing ASD interventions have also been suggested which include: 1) at least two experimental or quasi-experimental group design studies carried out by independent researchers; 2) at least five single-case design studies from at least three independent researchers; or, 3) a combination of at least one experimental and one quasi-experimental study and three single-case design studies from independent investigators (Odom, Collet-Klingenberg, Rogers, & Hatton, 2010). Though more research to establish P4P in this category is a necessary next step, the present study did fulfill criteria 1 related to ASD work in adding to establishing P4P as an evidence-based intervention. As mentioned in the limitations section, an RCT should be employed in future work.

In addition, though only one caregiver was involved as the target caregiver in the present study, looking at the family as whole is not often examined, and future studies could further this work, which suggests that more family involvement – as well as specifically sibling involvement – might be a logical extension to the examination of intervention programs. Though treatment of children with ASD has incorporated caregiver involvement in training and intervention administration for some time (Koegal, Schreibman, Britten, Burke, & O'Neill, 1982), it seems their role as the primary intervention provider and the exploration of family and relationship outcomes is a novel target of research. Looking at the entire family, evaluating family and relationship outcomes, beyond just those between the caregiver and child, will also help identify potential barriers to family involvement in interventions (Karst & Van Hecke, 2012). Even if they are not able to participate, fathers or other caregivers could complete additional measures. Mothers and fathers respond differently in certain circumstances (Bendixen et al., 2011), show different levels of adaptability, and also demonstrate different types of support they provide for their families (emotional vs. practical support, respectively; Seligman & Darling, 2007). Additional research should look at ags' or other caregivers' responses in order to get a more complete idea of other environmental variables.

Involvement of siblings, or similarly having them complete forms to go along with caregivers' forms, could also be a future target of research. This is especially notable since the sibling relationship is a core relationship within the family, and one that can impact other relationships (Shivers & Plavnick, 2005). This study indicates that further research is a necessary step towards continuing to design and administer interventions that are most fruitful for individuals with ASD, their caregivers, and their families. Along these lines, examining if there is a mechanistic role of caregiver involvement through mediation analyses could elucidate how improvements in these interventions occur.

As mentioned in the limitations section, further exploration of caregiver traits, including BAP or stress, could be an important step for future research and in determining how to tailor interventions. Since caregivers of children with ASD generally experience more stress than caregivers of other children (Davis & Carter, 2008; Estes et al., 2013), caregiver stress seems like an essential target to further study the mechanisms of intervention change. Additionally, mothers with high rigidity on BAP measures may benefit from learning adaptive emotion regulation strategies and research has found that more pragmatic difficulties, which is linked to social functioning, can interfere with positive mother-child interactions, with mothers demonstrating less positivity (Ingersoll & Hambrick, 2011; Rea, Factor, Swain, & Scarpa, 2019). Therefore, the presence of BAP features may dictate the amount and type of stress a caregiver experiences in interacting with their child or how they may respond to social coaching techniques. This would also allow further exploration of specific components of relationships and relationship quality, which might elucidate other facets of the caregiver-child relationship within the context of ASD. This might also reveal additional treatment targets. Additionally, examining child factors, such as behavior problems, could also be an important step in this area of research (Davis & Carter, 2008) as such behavior has been found to be a salient predictor of parenting stress and social functioning (Davis & Carter, 2008). This could further be explored in future work in looking at treatment outcomes.

Similarly, more longitudinal work in looking at these children as they mature may provide more information regarding the impact of teaching these social skills early. Currently, the majority of interventions for adolescents with ASD focus on deficits in social impairment (Karst & Van Hecke, 2012); however, as children with ASD develop, intervention targets change. Therefore, there might be a benefit in focusing specifically on social skills at a young age and it would be essential to the field of intervention research and in examining social functioning as a whole in the ASD population to determine if early intervention regarding social skills would negate the need for future social skills work.

Finally, considering the generalizability of these results is an area for future research, once this intervention is considered evidence-based. Adaptations for different functioning levels (e.g., lower IQs, less language), would be an important future direction. Additionally, adaptations for SES, race, and other factors, such as those noted above, may need to be considered in future work.

Conclusions

In sum, this pilot study provides initial support for a caregiver-assisted social skills group for preschoolers with ASD. Results not only demonstrated the feasibility of implementing and adapting the PEERS® curriculum for younger children, but allowed for the examination of both caregiver and child outcomes. Specifically, there were illustrated improvements in child social skills scores, an apparent decrease in ASD symptoms related to social skills (i.e., difficulties with social reciprocity), and also increases in caregiver self-efficacy scores and improvements in caregiver-child interaction scores, which may be related to the P4P intervention.

Results directly address one of the core features and challenges of young children with ASD, and support the potential benefits of social skills programs geared towards this age group (DeRosier et al., 2011; Reichow & Volkmar 2010). This study appears to be the first of its kind to demonstrate the potential efficacy of using caregiver-assistance in social skills training for preschool-aged children with ASD, and an RCT will add to the efficacious nature of the results and treatment. Findings from the current study address a large gap in the research literature by demonstrating the potential benefit of caregiver social-coaching in early childhood to likely improve friendship skills for young children with ASD. This study appears to directly target child and caregiver difficulties resulting from an ASD diagnosis in a positive and rewarding framework. Applying findings from this study will allow for a deeper understanding of the specific effectiveness of caregiver-assisted social skills on treatment implementation and child social skills, as well as caregiver confidence, parenting styles, and relationships/interactions with their child. Future work will allow further understanding of the specific effectiveness of caregiver-assisted social skills on treatment implementation, with an RCT design implemented to confirm the results, child behaviors, and family functioning.

References

Abidin, R. R. (2012). *Parenting Stress Index, Fourth Edition: Professional Manual*. Odessa, FL: Psychological Assessment Resources, Inc.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: American Psychiatric Association.

Arnold, D. S., O'leary, S. G., Wolff, L. S., & Acker, M. M. (1993). The Parenting Scale: A measure of dysfunctional parenting in discipline situations. *Psychological Assessment*, *5*(2), 137. https://doi.org/10.1037/1040-3590.5.2.137

Baker, J. K., Seltzer, M. M., & Greenberg, J. S. (2011). Longitudinal effects of adaptability on behavior problems and maternal depression in families of adolescents with autism. *Journal of Family Psychology*, *25*(4), 601. https://doi.org/10.1037/a0024409

Baron-Cohen, S., & Wheelwright, S. (2004). The empathy quotient: an investigation of adults with Asperger syndrome or high functioning autism, and normal sex differences. *Journal of Autism and Developmental Disorders*, *34*(2), 163-175. https://doi.org/10.1023/B:JADD.0000022607.19833.00

Bauminger, N., & Kasari, C. (2000). Loneliness and friendship in high-functioning children with autism. *Child Development*, *71*(2), 447-456. https://doi.org/10.1111/1467-8624.00156

Bauminger, N., Shulman, C., & Agam, G. (2003). Peer interaction and loneliness in high-functioning children with autism. *Journal of Autism and Developmental Disorders*, *33*(5), 489-507. https://doi.org/10.1023/A:1025827427901

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. *Journal of Autism and Developmental Disorders*, *43*(4), 829-840. https://doi.org/10.1007/s10803-012-1624-7

Bellini, S., Peters, J. K., Benner, L., & Hopf, A. (2007). A meta-analysis of school-based social skills interventions for children with autism spectrum disorders. *Remedial and Special Education*, *28*(3), 153-162. https://doi.org/10.1177/07419325070280030401

Bendixen, R. M., Elder, J. H., Donaldson, S., Kairalla, J. A., Valcante, G., & Ferdig, R. E. (2011). Effects of a father-based in-home intervention on perceived stress and family dynamics in parents of children with autism. *The American Journal of Occupational Therapy: Official Publication of the American Occupational Therapy Association*, *65*(6), 679–687. https://doi.org/10.5014/ajot.2011.001271

Benson, P. R. (2015). Longitudinal effects of educational involvement on parent and family functioning among mothers of children with ASD. *Research in Autism Spectrum Disorders*, *11*, 42-55. https://doi.org/10.1016/j.rasd.2014.11.011

Benson, P. R., & Karlof, K. L. (2008). Child, parent, and family predictors of latter adjustment in siblings of children with autism. *Research in Autism Spectrum Disorders*, *2*(4), 583-600. https://doi.org/10.1016/j.rasd.2007.12.002

Blackledge, J. T., & Hayes, S. C. (2006). Using acceptance and commitment training in the support of parents of children diagnosed with autism. *Child & Family Behavior Therapy*, *28*(1), 1-18. https://doi.org/10.1300/J019v28n01_01

Borckardt, J. J., Nash, M. R., Murphy, M. D., Moore, M., Shaw, D., & O'Neil, P. (2008). Clinical practice as natural laboratory for psychotherapy research. *American Psychologist*, 63, 77–95. doi:10.1037/0003-066X.63.2.77

Brookman-Frazee, L., & Koegel, R. L. (2004). Using parent/clinician partnerships in parent education programs for children with autism. *Journal of Positive Behavior Interventions*, *6*(4), 195-213. https://doi.org/10.1177/10983007040060040201

Carter, A. S., Davis, N. O., Klin, A., & Volkmar, F. R. (2005). Social Development in Autism. In F. R. Volkmar, R. Paul, A. Klin, & D. Cohen (Eds.), *Handbook of autism and pervasive developmental disorders: Diagnosis, development, neurobiology, and behavior* (p. 312–334). John Wiley & Sons Inc.

Centers for Disease Control and Prevention. (2014). Prevalence of Autism Spectrum Disorder Among Children Aged 8 year- Autism and Developmental Disabilities Monitoring Network, 11 sites, United States, 2010. *Morbidity and Mortality Weekly Report (MMWR; http://www.cdc.gov/mmwr/preview/mmwrhtml/ss6302a1.htm?s_cid=ss6302a1_w).* Accessed March 28, 2014.

Chamberlain, B., Kasari, C., & Rotheram-Fuller, E. (2007). Involvement or isolation? The social networks of children with autism in regular classrooms. *Journal of Autism and Developmental Disorders*, *37*(2), 230-242. https://doi.org/10.1007/s10803-006-0164-4

Chambless, D. L., & Hollon, S. D. (1998). Defining empirically supported therapies. *Journal of Consulting and Clinical Psychology*, *66*(1), 7. https://doi.org/10.1037/0022-006X.66.1.7

Constantino, J. N., & Gruber, C. P. (2012). *Social Responsiveness Scale, Second Edition*. Los Angeles, CA: Western Psychological Services.

Cox, M. J., & Paley, B. (1997). Families as systems. *Annual Review of Psychology*, 48, 243–267. https://doi.org/10.1111/1467-8721.01259

Cruz, L. P., Camargos-Junior, W., & Rocha, F. L. (2013). The broad autism phenotype in parents of individuals with autism: A systematic review of the literature. *Trends in Psychiatry and Psychotherapy, 35*, 252-263. https://doi.org/10.1590/2237-6089-2013-0019

Cridland, E. K., Jones, S. C., Magee, C. A., & Caputi, P. (2014). Family-focused autism spectrum disorder research: A review of the utility of family systems approaches. *Autism*, *18*(3), 213-222. https://doi.org/10.1177/1362361312472261

Davis, N. O., & Carter, A. S. (2008). Parenting stress in mothers and fathers of toddlers with autism spectrum disorders: Associations with child characteristics. *Journal of Autism and Developmental Disorders*, *38*(7), 1278-1291. https://doi.org/10.1007/s10803-007-0512-z

DeRosier, M. E., Swick, D. C., Davis, N. O., McMillen, J. S., & Matthews, R. (2011). The efficacy of a social skills group intervention for improving social behaviors in children with high functioning autism spectrum disorders. *Journal of Autism and Developmental Disorders, 41*(8), 1033-1043. doi:10.1007/s10803-010-1128-2

Dixon, L., Lucksted, A., Stewart, B., Burland, J., Brown, C. H., Postrado, L., ... & Hoffman, M. (2004). Outcomes of the peer‐taught 12‐week family‐to‐family education program for severe mental illness. *Acta Psychiatrica Scandinavica*, *109*(3), 207-215. https://doi.org/10.1046/j.0001-690X.2003.00242.x

Ekas, N. V., Lickenbrock, D. M., & Whitman, T. L. (2010). Optimism, social support, and well-being in mothers of children with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, *40*(10), 1274-1284. https://doi.org/10.1007/s10803-010-0986-y

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 and Development*, *35*(2), 133-138.

Factor, R. S., Ollendick, T. H., Cooper, L. D., Dunsmore, J. C., Rea, H. M., & Scarpa, A. (2019). All in the Family: A Systematic Review of the Effect of Caregiver-Administered Autism Spectrum Disorder Interventions on Family Functioning and Relationships. *Clinical Child and Family Psychology Review*, *22*(4), 433-457. https://doi.org/10.1007/s10567-019-00297-x

Farroni, T., Csibra, G., Simion, F., & Johnson, M. H. (2002). Eye contact detection in humans from birth. *Proceedings of the National Academy of Sciences*, *99*(14), 9602-9605. https://doi.org/10.1073/pnas.152159999

Frankel, F., Mintz, J. (2008). *Measuring the quality of play dates.* Available from UCLA Parenting and Children's Friendship Program, 300 Medical Plaza, Los Angeles.

Frith, C. D. (2004). Schizophrenia and theory of mind. *Psychological Medicine*, *34*(3), 385-389. https://doi.org/10.1017/S0033291703001326

Fritz, C. O., Morris, P. E., & Richler, J. J. (2012). Effect size estimates: Current use, calculations, and interpretation. *Journal of Experimental Psychology: General, 141*(1), 2-18. https://doi.org/10.1037/a0024338

Gantman, A., Kapp, S. K., Orenski, K., & Laugeson, E. A. (2012). Social skills training for young adults with high-functioning autism spectrum disorders: A randomized controlled pilot study. *Journal of Autism and Developmental Disorders*, *42*(6), 1094-1103. https://doi.org/10.1007/s10803-011-1350-6

Granger, S., des Rivières-Pigeon, C., Sabourin, G., & Forget, J. (2012). Mothers' reports of their involvement in early intensive behavioral intervention. *Topics in Early Childhood Special Education*, *32*(2), 68-77. https://doi.org/10.1177/0271121410393285

Gresham, F. M., & Elliott, S. N. (2008). *Social Skills Improvement System Rating Scales Manual*. Minneapolis, MN: NCS Pearson.

Grindle, C. F., Kovshoff, H., Hastings, R. P., & Remington, B. (2009). Parents' experiences of applied behaviour analysis (ABA)-based interventions for children diagnosed with autistic spectrum disorder. *Journal of Autism and Developmental Disorders*, *39*(1), 42–56. https://doi.org/10.1007/s10803-008-0597-z

Grzadzinski, R., Di Martino, A., Brady, E., Mairena, M. A., O'Neale, M., Petkova, E., ... & Castellanos, F. X. (2011). Examining autistic traits in children with ADHD: Does the autism spectrum extend to ADHD?. *Journal of Autism and Developmental Disorders*, *41*(9), 1178-1191. https://doi.org/10.1007/s10803-010-1135-3

Gulsrud, A. C., Jahromi, L. B., & Kasari, C. (2010). The co-regulation of emotions between mothers and their children with autism. *Journal of Autism and Developmental Disorders*, 40(2), 227-237. doi:10.1007/s10803-009-0861-x

Hastings, R., & Brown, T. (2002). Behavior problems of children with autism, parental self-efficacy, and mental health. *American Journal on Mental Retardation*, 107(3), 222-232. 10.1007/s10803-018-3605-y.

Hastings, R. P., Kovshoff, H., Brown, T., Ward, N. J., Espinosa, F. D., & Remington, B. (2005). Coping strategies in mothers and fathers of preschool and school-age children with autism. *Autism*, 9(4), 377-391. doi:10.1177/1362361305056078

Higgins, D. J., Bailey, S. R., & Pearce, J. C. (2005). Factors associated with functioning style and coping strategies of families with a child with an autism spectrum disorder. *Autism*, *9*(2), 125-137. https://doi.org/10.1177/1362361305051403

Hoffman, C. D., Sweeney, D. P., Hodge, D., Lopez-Wagner, M. C., & Looney, L. (2009). Parenting stress and closeness: Mothers of typically developing children and mothers of children with autism. *Focus on Autism and Other Developmental Disabilities*, *24*(3), 178-187. https://doi.org/10.1177/1088357609338715

Horner, R. H., Carr, E. G., Halle, J., McGee, G., Odom, S., & Wolery, M. (2005). The use of single-subject research to identify evidence-based practice in special education. *Exceptional Children*, 71, 165–179. http://dx.doi.org/10.1177/ 001440290507100203

Ichikawa, K., Takahashi, Y., Ando, M., Anme, T., Ishizaki, T., Yamaguchi, H., & Nakayama, T. (2013). TEACCH-based group social skills training for children with high-functioning autism: A pilot randomized controlled trial. *BioPsychoSocial Medicine*, *7*. https://doi.org/10.1186/1751-0759-7-14

Ingersoll, B., & Hambrick, D. Z. (2011). The relationship between the broader autism phenotype, child severity, and stress and depression in parents of children with autism spectrum disorders. *Research in Autism Spectrum Disorders*, 5(1), 337-344. doi:10.1016/j.rasd.2010.04.017

Jacobson, N. S., & Truax, P. (1991). Clinical significance: A statistical approach to defining meaningful change in psychotherapy research. *Journal of Consulting and Clinical Psychology*, 59, 12–19. doi:10.1037/0022-006X.59.1.12

Jenson, W. R., Bowen, J., Clark, E., Block, H., Gabriensen, T., Hood, J., et al. (2011). *Superheroes Social Skills*. Eugene, OR: Pacific Northwest.

Johnson, E., & Hastings, R. P. (2002). Facilitating factors and barriers to the implementation of intensive home-based behavioural intervention for young children with autism. *Child: Care, Health and Development*, *28*(2), 123-129. https://doi.org/10.1046/j.1365-2214.2002.00251.x

Johnston, C., & Mash, E. J. (1989). A measure of parenting satisfaction and efficacy. *Journal of Clinical Child Psychology*, *18*(2), 167-175. https://doi.org/10.1207/s15374424jccp1802_8

Jones, T. L., & Prinz, R. J. (2005). Potential roles of parental self-efficacy in parent and child adjustment: A review. *Clinical Psychology Review*, 25, 341–363. doi:10.1016/j.cpr.2004.12.004

Kaat, A. J., & Lecavalier, L. (2014). Group-based social skills treatment: a methodological review. *Research in Autism Spectrum Disorders*, *8*(1), 15-24. https://doi.org/10.1016/j.rasd.2013.10.007

Karst, J. S., Van Hecke, A. V., Carson, A. M., Stevens, S., Schohl, K., & Dolan, B. (2015). Parent and family outcomes of PEERS: A social skills intervention for adolescents with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, *45*(3), 752–765. https://doi.org/10.1007/s10803-014-2231-6

Karst, J. S., & Van Hecke, A. V. (2012). Parent and family impact of autism spectrum disorders: A review and proposed model for intervention evaluation. *Clinical Child and Family Psychology Review*, *15*(3), 247-277. https://doi.org/10.1007/s10567-012-0119-6

Kasari, C., & Rotheram-Fuller, E. (2005). Current trends in psychological research on children with high-functioning autism and Asperger disorder. *Current Opinion in Psychiatry*, *18*(5), 497-501. doi: 10.1097/01.yco.0000179486.47144.61

Kasari, C., Locke, J., Gulsrud, A., & Rotheram-Fuller, E. (2011). Social networks and friendships at school: Comparing children with and without ASD. *Journal of Autism and Developmental Disorders*, *41*(5), 533-544. https://doi.org/10.1007/s10803-010-1076-x

Kasari, C., Dean, M., Kretzmann, M., Shih, W., Orlich, F., Whitney, R., ... & King, B. (2016). Children with autism spectrum disorder and social skills groups at school: A randomized trial comparing intervention approach and peer composition. *Journal of Child Psychology and Psychiatry*, *57*(2), 171-179. https://doi.org/10.1111/jcpp.12460

Kaufman, A. S., & Kaufman, N. L. (2004). *Kaufman brief intelligence test*. John Wiley & Sons, Inc.

Kelly, A. B., Garnett, M. S., Attwood, T., & Peterson, C. (2008). Autism spectrum symptomatology in children: The impact of family and peer relationships. *Journal of Abnormal Child Psychology*, *36*(7), 1069. https://doi.org/10.1007/s10802-008-9234-8

Knott, F., Dunlop, A. W., & Mackay, T. (2006). Living with ASD: How do children and their parents assess their difficulties with social interaction and understanding?. *Autism*, *10*(6), 609-617. https://doi.org/10.1177/1362361306068510

Koegel, R. L., Schreibman, L., Britten, K. R., Burke, J. C., & O'Neill, R. E. (1982). A comparison of parent training to direct child treatment. *Educating and Understanding Autistic Children*, 260-279.

Lam, S. F., Wong, B. P., Leung, D., Ho, D., & Au-Yeung, P. (2010). How parents perceive and feel about participation in community activities: The comparison between parents of preschoolers with and without autism spectrum disorders. *Autism*, *14*(4), 359-377. https://doi.org/10.1177/1362361309346558

Larkin, F., Guerin, S., Hobson, J. A., & Gutstein, S. E. (2015). The Relationship Development Assessment–Research Version: Preliminary validation of a clinical tool and coding schemes to measure parent-child interaction in autism. *Clinical Child Psychology and Psychiatry*, *20*(2), 239-260. https://doi.org/10.1177/1359104513514065

Laugeson, E. A., Frankel, F., Mogil, C., & Dillon, A. R. (2009). Parent-assisted social skills training to improve friendships in teens with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, *39*(4), 596-606. https://doi.org/10.1007/s10803-008-0664-5

Laugeson, E. A., & Frankel, F. (2010). Social skills for teenagers with developmental and autism spectrum disorder: The PEERS treatment manual. New York: Routledge.

Laugeson, E. A., Frankel, F., Gantman, A., Dillon, A. R., & Mogil, C. (2012). Evidence-based social skills training for adolescents with autism spectrum disorders: The UCLA PEERS program. *Journal of Autism and Developmental Disorders*, *42*(6), 1025-1036. https://doi.org/10.1007/s10803-011-1339-1

Laugeson, E. A., Sanderson, J., & Park, M. N. (2014). PEERS® for Preschoolers: Parent Assisted Social Skills Training for Children with Autism Spectrum Disorder. Manuscript in preparation.

Laugeson, E. A., Gantman, A., Kapp, S. K., Orenski, K., & Ellingsen, R. (2015). A randomized controlled trial to improve social skills in young adults with autism spectrum disorder: The UCLA PEERS® program. *Journal of Autism and Developmental Disorders*, *45*(12), 3978-3989. doi: 10.1007/s10803-015-2504-8.

Laugeson, Park, Bolton, Bolourian, & Sanderson. (2016) A Randomized Controlled Trial of a Parent-Assisted Social Skills Treatment: The UCLA PEERS® for Preschoolers Program.

Poster abstract presented at the International Meeting for Autism Research, Baltimore, MD.

Leaf, J. B., Leaf, R., McEachin, J., Taubman, M., Ala'i-Rosales, S., Ross, R. K., ... & Weiss, M. J. (2016). Applied behavior analysis is a science and, therefore, progressive. *Journal of Autism and Developmental Disorders*, *46*(2), 720-731. https://doi.org/10.1007/s10803-015-2591-6

Lord, C., & MaGill-Evans, J. (1995). Peer interactions of autistic children and adolescents. *Development and Psychopathology*, *7*(4), 611-626. https://doi.org/10.1017/S095457940000674X

Lord, C., Bristol-Power, M., Cafiero, J. M., Filipek, P. A., Gallagher, J. J., Harris, S. L., et al. (2001). *Educating Children with Autism*. Washington, DC: National Academy Press.

Lord, C., Wagner, A., Rogers, S., Szatmari, P., Aman, M., Charman, T., ... & Harris, S. (2005). Challenges in evaluating psychosocial interventions for autistic spectrum disorders. *Journal of Autism and Developmental Disorders*, *35*(6), 695-708. https://doi.org/10.1007/s10803-005-0017-6

Lord, C., & Bishop, S. L. (2010). Autism Spectrum Disorders: Diagnosis, Prevalence, and Services for Children and Families. Social Policy Report. Volume 24, Number 2. *Society for Research in Child Development*, 24 (2).

Lord C., Rutter M., DiLavore P. C., Risi S., Gotham K., Bishop S. (2012). *Autism Diagnostic Observation Schedule, Second Edition.* Torrance, CA: Western Psychological Services

Luiselli, J. K., Cannon, B. O. M., Ellis, J. T., & Sisson, R. W. (2000). Home-Based Behavioral Intervention for Young Children with Autism/Pervasive Developmental Disorder A

Preliminary Evaluation of Outcome in Relation to Child Age and Intensity of Service Delivery. *Autism*, *4*(4), 426-438. https://doi.org/10.1177/1362361300004004007

Maag, J. W. (2006). Social skills training for students with emotional and behavioral disorders: A review of reviews. *Behavioral Disorders*, 4-17. https://doi.org/10.1177/019874290603200104

Mahoney, G., Powell, A., & Finger, I. (1986). The Maternal Behavior Rating Scale. *Topics in Early Childhood Special Education*, *6*(2), 44-56. https://doi.org/10.1177/027112148600600205

Mandelberg, J., Laugeson, E. A., Cunningham, T. D., Ellingsen, R., Bates, S., & Frankel, F. (2014). Long-term treatment outcomes for parent-assisted social skills training for adolescents with autism spectrum disorders: The UCLA PEERS program. *Journal of Mental Health Research in Intellectual Disabilities*, *7*(1), 45-73. https://doi.org/10.1080/19315864.2012.730600

Matheny, A. P., Wachs, T. D., Ludwig, J. L., & Phillips, K. (1995). Bringing order out of chaos: Psychometric characteristics of the confusion, hubbub, and order scale. *Journal of Applied Developmental Psychology*, *16*(3), 429-444. https://doi.org/10.1016/0193-3973(95)90028-4

Maxwell, C. R., Parish-Morris, J., Hsin, O., Bush, J. C., & Schultz, R. T. (2013). The broad autism phenotype predicts child functioning in autism spectrum disorders. *Journal of Neurodevelopmental Disorders, 5*, 5-25. https://doi.org/10.1186/1866-1955-5-25

McConachie, H., & Diggle, T. (2007). Parent implemented early intervention for young children with autism spectrum disorder: A systematic review. *Journal of Evaluation in Clinical Practice*, *13*(1), 120-129. https://doi.org/10.1111/j.1365-2753.2006.00674.x

Messinger, D. S., Fogel, A., & Dickson, K. L. (2001). All smiles are positive, but some smiles are more positive than others. *Developmental Psychology*, *37*(5), 642. https://doi.org/10.1037/0012-1649.37.5.642

Midouhas, E., Yogaratnam, A., Flouri, E., & Charman, T. (2013). Psychopathology trajectories of children with autism spectrum disorder: The role of family poverty and parenting. *Journal of the American Academy of Child & Adolescent Psychiatry*, *52*(10), 1057-1065. https://doi.org/10.1016/j.jaac.2013.07.011

Minjarez, M. B., Mercier, E. M., Williams, S. E., & Hardan, A. Y. (2013). Impact of Pivotal Response Training Group Therapy on Stress and Empowerment in Parents of Children With Autism. *Journal of Positive Behavior Interventions*, *15*(2), 71–78. https://doi.org/10.1177/1098300712449055

Minuchin, S. (1974). *Families and Family Therapy*. Harvard University Press.

Minuchin, P. (1985). Families and individual development: Provocations from the field of family therapy. *Child Development*, 56, 289–302. https://www.jstor.org/stable/1129720

Morgan, D. L., & Morgan, R. K. (2008). *Single-case research methods for the behavioral and health sciences.* Thousand Oaks, CA: Sage publications.

Mugno, D., Ruta, L., D'Arrigo, V. G., & Mazzone, L. (2007). Impairment of quality of life in parents of children and adolescents with pervasive developmental disorder. *Health and Quality of Life Outcomes*, *5*(1), 22. https://doi.org/10.1186/1477-7525-5-22

Mundy, P. (2016). *Autism and joint attention: Developmental, neuroscience, and clinical fundamentals*. New York: Guilford Pub. Inc.

Murdock, L. C., Ganz, J., & Crittendon, J. (2013). Use of an iPad play story to increase play dialogue of preschoolers with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, *43*(9), 2174-2189. https://doi.org/10.1007/s10803-013-1770-6

Odom, S. L., Collet-Klingenberg, L., Rogers, S. J., & Hatton, D. D. (2010). Evidence-based practices in interventions for children and youth with autism spectrum disorders. *Preventing School Failure: Alternative education for children and youth*, *54*(4), 275-282. https://doi.org/10.1080/10459881003785506

Olson, D. H., Sprenkle, D. H., & Russell, C. S. (1979). Circumplex model of marital and family systems: I. Cohesion and adaptability dimensions, family types, and clinical applications. *Family Process*, *18*(1), 3-28. https://doi.org/10.1111/j.1545-5300.1979.00003.x

Osborne, L. A., McHugh, L., Saunders, J., & Reed, P. (2008). The effect of parenting behaviors on subsequent child behavior problems in autistic spectrum conditions. *Research in Autism Spectrum Disorders*, *2*(2), 249-263. https://doi.org/10.1016/j.rasd.2007.06.004

Parker, R. I., & Hagan-Burke, S. (2007). Single case research results as clinical outcomes. *Journal of School Psychology*, 45, 637–653. doi:10.1016/j.jsp.2007.07.004

Paul, R. (2003). Promoting social communication in high functioning individuals with autistic spectrum disorders. *Child and Adolescent Psychiatric Clinics of North America*, *12*(1), 87-106. 10.1016/S1056-4993(02)00047-0,

Piven, J., Palmer, P., Jacobi, D., Childress, D., & Arndt, S. (1997). Broader autism phenotype: Evidence from a family history study of multiple-incidence autism families. *American Journal of Psychiatry*, 154(2), 185-190. doi:10.1176/ajp.154.2.18

Radley, K. C., Ford, W. B., McHugh, M. B., Dadakhodjaeva, K., O'Handley, R. D., Battaglia, A. A., & Lum, J. D. (2015). Brief report: Use of superheroes social skills to promote accurate social skill use in children with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, *45*(9), 3048-3054. https://doi.org/10.1007/s10803-015-2442-5

Rao, P. A., Beidel, D. C., & Murray, M. J. (2008). Social skills interventions for children with Asperger's syndrome or high-functioning autism: A review and recommendations. *Journal of Autism and Developmental Disorders, 38*(2), 353-361. doi:10.1007/s10803-007-0402-4

Rao, P. A., & Beidel, D. C. (2009). The impact of children with high functioning autism on parental stress, sibling adjustment, and family functioning. *Behavior Modification*, *33*(4), 437–451.doi:10.1177/0145445509336427.

Rea, H. M., Factor, R. S., Swain, D. M., & Scarpa, A. (2019). The Association of the Broader Autism Phenotype with Emotion-Related Behaviors in Mothers of Children With and Without Autism Spectrum Traits. *Journal of Autism and Developmental Disorders*, *49*(3), 950-959. https://doi.org/10.1007/s10803-018-3785-5

Reichow, B., & Volkmar, F. R. (2010). Social skills interventions for individuals with autism: Evaluation for evidence-based practices within a best evidence synthesis framework. *Journal of Autism and Developmental Disorders*, *40*(2), 149-166. https://doi.org/10.1007/s10803-009-0842-0

Reichow, B., Steiner, A. M., & Volkmar, F. (2012). Social skills groups for people aged 6 to 21 with autism spectrum disorders (ASD). *The Cochrane Database of Systematic Reviews, 7*(7), CD008511. doi:10.1002/14651858.CD008511.pub2

Rivet, T. T., & Matson, J. L. (2011). Review of gender differences in core symptomatology in autism spectrum disorders. *Research in Autism Spectrum Disorders*, *5*(3), 957–976. https://doi.org/10.1016/j.rasd.2010.12.003

Roberts, D., & Pickering, N. (2010). Parent training programme for Autism Spectrum Disorders: An evaluation. *Community Practitioner*, 83(10), 27–30. 10.1016/S1056-4993(02)00047-0

Rogers, S. J. (2000). Interventions that facilitate socialization in children with autism. *Journal of Autism and Developmental Disorders*, *30*(5), 399-409. https://doi.org/10.1023/A:1005543321840

Rogers, S. J., Estes, A., Lord, C., Vismara, L., Winter, J., Fitzpatrick, A., ... & Dawson, G. (2012). Effects of a brief Early Start Denver Model (ESDM)–based parent intervention on toddlers at risk for autism spectrum disorders: A randomized controlled trial. *Journal of the American Academy of Child & Adolescent Psychiatry*, *51*(10), 1052-1065. https://doi.org/10.1016/j.jaac.2012.08.003

Schertz, H. H., & Odom, S. L. (2007). Promoting joint attention in toddlers with autism: A parent-mediated developmental model. *Journal of Autism and Developmental Disorders*, *37*(8), 1562-1575. https://doi.org/10.1007/s10803-006-0290-z

Schertz, H. H., Baker, C., Hurwitz, S., & Benner, L. (2011). Principles of early intervention reflected in toddler research in autism spectrum disorders. *Topics in Early Childhood Special Education*, *31*(1), 4-21. https://doi.org/10.1177/0271121410382460

Schreiber, C. (2011). Social skills interventions for children with high-functioning autism spectrum disorders. *Journal of Positive Behavior Interventions*, *13*(1), 49-62. https://doi.org/10.1177/1098300709359027

Seligman, M., & Darling, R. B. (2009). *Ordinary families, special children: A systems approach to childhood disability*. Guilford Publications.

Siegel, B., Vukicevic, J., Elliott, G. R., & Kraemer, H. C. (1989). The use of signal detection theory to assess DSM-III-R criteria for autistic disorder. *Journal of the American Academy of Child & Adolescent Psychiatry*, *28*(4), 542-548. https://doi.org/10.1097/00004583-198907000-00013

Sigman, M., Ruskin, E., Arbelle, S., Corona, R., Dissanayake, C., Espinosa, M., ... & Robinson, B. F. (1999). Continuity and change in the social competence of children with autism, Down syndrome, and developmental delays. *Monographs of the Society for Research in Child Development*, i-139. https://www.jstor.org/stable/3181510

Sikora, D., Moran, E., Orlich, F., Hall, T. A., Kovacs, E. A., Delahaye, J., ... & Kuhlthau, K. (2013). The relationship between family functioning and behavior problems in children with autism spectrum disorders. *Research in Autism Spectrum Disorders*, *7*(2), 307-315. https://doi.org/10.1016/j.rasd.2012.09.006

Sivberg, B. (2002). Family system and coping behaviors: A comparison between parents of children with autistic spectrum disorders and parents with non-autistic children. *Autism*, *6*(4), 397-409. https://doi.org/10.1177/1362361302006004006

Shivers, C. M., & Plavnick, J. B. (2015). Sibling involvement in interventions for individuals with autism spectrum disorders: a systematic review. *Journal of Autism and Developmental Disorders*, *45*(3), 685-696. https://doi.org/10.1007/s10803-014-2222-7

Smith, T., Scahill, L., Dawson, G., Guthrie, D., Lord, C., Odom, S., ... & Wagner, A. (2007). Designing research studies on psychosocial interventions in autism. *Journal of Autism* *and Developmental Disorders*, *37*(2), 354-366. https://doi.org/10.1007/s10803-006-0173-3

Sparrow, S. S., Cicchetti, D. V., Balla, D. A., & Doll, E. A. (2005). *Vineland Adaptive Behavior Scales: Survey forms manual*. American Guidance Service.

Sofronoff, K., & Farbotko, M. (2002). The effectiveness of parent management training to increase self-efficacy in parents of children with asperger syndrome. *Autism*, 6(3), 271-286. doi:10.1177/1362361302006003005

Solomon, M., Goodlin-Jones, B. L., & Anders, T. F. (2004). A social adjustment enhancement intervention for high functioning autism, Asperger's syndrome, and pervasive developmental disorder NOS. *Journal of Autism and Developmental Disorders*, *34*(6), 649-668. https://doi.org/10.1007/s10803-004-5286-y

Steiner, A. M., Gengoux, G. W., Klin, A., & Chawarska, K. (2013). Pivotal response treatment for infants at-risk for autism spectrum disorders: A pilot study. *Journal of Autism and Developmental Disorders*, *43*(1), 91-102. https://doi.org/10.1007/s10803-012-1542-8

Thompson, L., Lobb, C., Elling, R., Herman, S., Jurkiewicz, T., & Hulleza, C. (1997). Pathways to family empowerment: Effects of family-centered delivery of early intervention services. *Exceptional Children*, *64*(1), 99-113. https://doi.org/10.1177/001440299706400107

Thompson, G. A., McFerran, K. S., & Gold, C. (2014). Family-centred music therapy to promote social engagement in young children with severe autism spectrum disorder: a randomized controlled study. *Child: Care, Health and Development*, *40*(6), 840–852. https://doi.org/10.1111/cch.12121

Tomasello, M. (2001). Perceiving intention and learning words in the second year of life. In M.

Bowerman & S. Levinson (Eds.), *Language acquisition and conceptual development* (pp. 133–158). New York: Cambridge University Press.

Tsao, L. L., & Odom, S. L. (2006). Sibling-mediated social interaction intervention for young children with autism. *Topics in Early Childhood Special Education*, *26*(2), 106-123. https://doi.org/10.1177/02711214060260020101

Van Hecke, A. V., Stevens, S., Carson, A. M., Karst, J. S., Dolan, B., Schohl, K., ... & Brockman, S. (2015). Measuring the plasticity of social approach: A randomized controlled trial of the effects of the PEERS intervention on EEG asymmetry in adolescents with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, *45*(2), 316-335. https://doi.org/10.1007/s10803-013-1883-y

Wan, M. W., Green, J., Elsabbagh, M., Johnson, M., Charman, T., & Plummer, F. (2013). Quality of interaction between at‐risk infants and caregiver at 12–15 months is associated with 3‐year autism outcome. *Journal of Child Psychology and Psychiatry*, *54*(7), 763-771. https://doi.org/10.1111/jcpp.12032

Wang, S. Y., Parrila, R., & Cui, Y. (2013). Meta-analysis of social skills interventions of single-case research for individuals with autism spectrum disorders: Results from three-level HLM. *Journal of Autism and Developmental Disorders*, *43*(7), 1701-1716. https://doi.org/10.1007/s10803-012-1726-2

Watkins, L., Kuhn, M., Ledbetter-Cho, K., Gevarter, C., & O'Reilly, M. (2017). Evidence-based social communication interventions for children with autism spectrum disorder. *The Indian Journal of Pediatrics*, *84*(1), 68-75. https://doi.org/10.1007/s12098-015-1938-5

White, S. W., Keonig, K., & Scahill, L. (2007). Social skills development in children with autism spectrum disorders: A review of the intervention research. *Journal of Autism and*

Developmental Disorders, *37*(10), 1858-1868. https://doi.org/10.1007/s10803-006-0320-x

White, S. W., & Maddox, B. B. (2013). Social interventions. In F. R. Volkmar (Ed.), *Encyclopedia of autism spectrum disorders* (Vol. 3, pp. 2896–2903). Berlin, Germany: Springer. doi:10.1007/SpringerReference_3342222012-12-1214:35:13 UTC

Whittingham, K., Sofronoff, K., Sheffield, J., & Sanders, M. R. (2009). Stepping Stones Triple P: an RCT of a parenting program with parents of a child diagnosed with an autism spectrum disorder. *Journal of Abnormal Child Psychology*, *37*(4), 469–480. https://doi.org/10.1007/s10802-008-9285-x

Wong, C., Odom, S. L., Hume, K. A., Cox, A. W., Fettig, A., Kucharczyk, S., ... & Schultz, T. R. (2015). Evidence-based practices for children, youth, and young adults with autism spectrum disorder: A comprehensive review. *Journal of Autism and Developmental Disorders*, *45*(7), 1951-1966. https://doi.org/10.1007/s10803-014-2351-z

Yoo, H. J., Bahn, G., Cho, I. H., Kim, E. K., Kim, J. H., Min, J. W., ... & Cho, S. (2014). A Randomized Controlled Trial of the Korean Version of the PEERS® Parent‐Assisted Social Skills Training Program for Teens With ASD. *Autism Research*, *7*(1), 145-161. https://doi.org/10.1002/aur.1354

Tables

Table 1

Descriptive Statistics for Demographic Information and Characterization of Sample

Measure	**n**	**Minimum**	**Maximum**	***M***	***SD***
Demographics					
Caregiver Age (years)	15	27.00	42.00	36.13	5.14
Child Age at Intake (years)	15	3.00	7.00	4.87	1.25
Diagnostic and Screening Measures					
ADOS-2 (comparison Score)	Mod 2 = 5 Mod 3 = 10	4	10	6.80	2.01
KBIT-2 IQ Composite	15	76	127	102.00	15.34
VABS-3	14				
Adaptive Functioning Composite	14	69	96	79.43	8.84
Socialization	14	60	90	72.14	9.88
Daily Living	14	65	118	88.64	16.75
Communication	14	73	100	83.43	7.99

Note. ADOS-2 = Autism Diagnostic Observation Schedule, Second Edition, KBIT-2 IQ Composite = Kaufman Brief Intelligence Test Intelligence Quotient Total Score; Autism Quotient total score; VABS-3 = Vineland Adaptive Behavior Scale – Third Edition

Table 2

Descriptive Statistics for Categorical Variables of Interest

Variable	**Percentage (*n*)**
Child Gender	
Male	73.3 (11)
Female	26.7 (4)
Caregiver Gender (completed interaction task)	
Male	6.67 (1)
Female	93.3 (14)
Location	
Blacksburg	66.67 (10)
Atlanta	33.33 (5)
Number of children in each group	
Group 1	13.3 (2)
Group 2	26.7 (4)
Group 3	26.7 (4)
Group 4	33.3 (5)
Diagnoses (in addition to ASD)	
ADHD	40 (6)
GAD	20 (3)
OCD	20 (3)
DD	6.7 (1)
Child Ethnicity	
African American	13.3 (2)
Asian	6.7 (1)
Caucasian	66.7 (10)
Mixed Race	6.7 (1)
Other	6.7 (1)
Number of Siblings	
None	26.7 (4)
One	46.7 (7)
Two	20.0 (3)
Three	6.7 (1)
Approximate Yearly Household Income	
Less than $10,000	6.7 (1)
$10,000-$25,000	6.7 (1)
$50,000-$75,000	6.7 (1)
$100,000-$200,000	20.0 (3)
$200,000+	13.3 (2)
Did not report	46.7 (7)
Marital Status	
Married	13.3 (2)
Widowed	6.7 (1)
Did not report	80 (12)
Highest Level of Schooling Completed by caregiver	
Graduated from High School	13.3 (2)

Graduated from Trade School	13.3 (2)
Associate’s degree	6.7 (1)
Bachelors/4-year degree	6.7 (1)
Graduate School	53.3 (8)
Did not report	6.7 (1)

Table 3
Entry/Pre-Treatment Statistics for Outcome Measures and Variables of Interest

Measure	**n**	**Minimum**	**Maximum**	***M***	***SD***
Social Skills					
SSM	10	31	50	41	6.12
SRS-2 – total score	15	54	90	74.67	9.38
Social Awareness	15	51	82	68.73	10.05
Social Communication	15	54	83	71.80	8.29
Social Motivation	15	49	90	71.33	13.82
Social Cognition	15	56	90	71.33	11.24
SCI	15	53	90	73.67	9.63
RRB	15	58	90	77.60	10.01
SSIS	14	47	92	72.29	14.19
QPQ	11	5	23	11.64	5.50
Caregiver Efficacy and Behavior					
SSM					
Confidence	6	2	4	2.67	.82
Stress	6	1	3	2.33	.82
PSEMAS	15	.400	4.500	2.85	.95
MBRS					
RCO	15	1.83	5.00	3.38	.89
AA	15	2.20	3.80	2.98	.48
AO	15	1.00	3.00	1.67	.67
DR	15	2.00	4.50	2.70	.72
PS – Total	12	1.90	4.10	3.08	.68
Laxness	11	1.55	5.40	3.14	1.12
Overreactivity	11	1.2	4.2	2.50	.95
Verbosity	12	2.00	5.43	3.73	.87
Family Functioning					
CHAOS	12	29	45	37.33	4.87

Note. SSM = Social Skills Monitoring Social score; SRS-2 = Social Responsiveness Scale, second edition, SCI = Social Communication Index; SSIS = Social Skills Improvement System Social Skills Scale; QPQ = The Quality of Play Questionnaire; SSM = Social Skills Monitoring Confidence and Stress questions; PSEMAS = Parental Self-Efficacy in the Management of Asperger Syndrome total self-efficacy; MBRS = The Maternal Behavioral Rating Scale, RCO = responsiveness, AA = affect, AO = achievement, and DR = directiveness, PS = Parenting Scale total score, laxness, overreactivity, and verbosity; CHAOS = Confusion, Hubbub, and Order Scale total score

Table 4

Midpoint (Session 8) Statistics for Outcome Measures and Variables of Interest

Measure	n	Minimum	Maximum	*M*	*SD*
Social Skills					
SSM- Social	12	22	56	46.42	9.04
SRS-2 - Total	14	56	83	70.43	7.27
Social Awareness	14	59	82	71.50	6.32
Social Communication	14	54	89	67.14	9.71
Social Motivation	14	56	82	70.07	7.31
Social Cognition	14	51	86	67.14	10.98
SCI	14	49	85	67.43	9.61
RRB	14	64	84	72.23	5.45
SSIS	15	64	96	79.60	9.78
QPQ	13	5	23	9.85	5.34
Caregiver Efficacy and Behavior					
SSM					
Confidence	3	2	3	2.67	.58
Stress	3	3	3	3	.00
PSEMAS	15	2.45	4.62	3.43	.65
MBRS					
RCO	15	2.17	5.00	3.47	.68
AA	15	2.60	5.00	3.19	.58
AO	15	1.00	3.00	2.00	.73
DR	15	1.75	4.25	2.70	.721
PS - Total	12	1.57	3.90	2.94	.72
Verbosity	12	1.14	4.71	3.47	1.12
Laxness	12	1.91	5.00	3.10	.98
Overreactivity	12	1.3	3.8	2.26	.73
Family Functioning					
CHAOS	10	35	44	37.20	2.82

Note. SSM = Social Skills Monitoring Social score; SRS-2 = Social Responsiveness Scale, second edition, SCI = Social Communication Index; SSIS = Social Skills Improvement System Social Skills Scale; QPQ = The Quality of Play Questionnaire; SSM = Social Skills Monitoring Confidence and Stress questions; PSEMAS = Parental Self-Efficacy in the Management of Asperger Syndrome total score; MBRS = The Maternal Behavioral Rating Scale, RCO = responsiveness, AA = affect, AO = achievement, and DR = directiveness, PS = Parenting Scale total score, laxness, overreactivity, and verbosity; CHAOS = Confusion, Hubbub, and Order Scale total score

Table 5

Exit/Post-Treatment Statistics for Outcome Measures and Variables of Interest

Measure	**n**	**Minimum**	**Maximum**	***M***	***SD***
Social Skills					
SSM	10	38.00	58.00	51.10	7.05
SRS-2 - Total	10	60.00	78.00	70.00	5.68
Social Awareness	10	54	80	64.80	8.52
Social Communication	10	57	78	68.70	8.30
Social Motivation	10	55	78	64.40	7.68
Social Cognition	10	58	76	65.90	5.30
SCI	10	58	76	68.30	5.74
RRB	10	64	90	75.40	8.18
SSIS	10	58	92	79.50	11.52
QPQ	10	2	13	6.60	3.66
Caregiver Efficacy and Behavior					
SSM					
Confidence	6	3	4	3.17	.41
Stress	6	2	4	2.83	.75
PSEMAS	10	2.73	4.10	3.42	.48
MBRS					
RCO	14	2.66	4.67	3.62	.64
AA	14	2.40	3.60	2.87	.40
AO	14	1.00	3.50	1.96	.69
DR	14	2.00	3.50	2.91	.36
PS - Total	10	1.57	3.70	2.74	.68
Verbosity	10	1.29	6.00	3.44	1.29
Laxness	10	1.91	5.18	3.05	1.05
Overreactivity	10	1.2	3.2	1.95	.64
Family Functioning					
CHAOS	10	33	44	39	3.65

Note. SSM = Social Skills Monitoring Social score; SRS-2 = Social Responsiveness Scale, second edition, SCI = Social Communication Index; SSIS = Social Skills Improvement System Social Skills Scale; QPQ = The Quality of Play Questionnaire; SSM = Social Skills Monitoring Confidence and Stress questions; PSEMAS = Parental Self-Efficacy in the Management of Asperger Syndrome total score; MBRS = The Maternal Behavioral Rating Scale, RCO = responsiveness, AA = affect, AO = achievement, and DR = directiveness, PS = Parenting Scale total score, laxness, overreactivity, and verbosity; CHAOS = Confusion, Hubbub, and Order Scale total score

Table 6

Follow-up Statistics for Outcome Measures and Variables of Interest

Measure	n	Minimum	Maximum	*M*	*SD*
Social Skills					
SSM	14	37.00	58.00	49.14	6.41
SRS-2 - total	14	60.00	88.00	69.36	8.31
Social Awareness	14	54.00	80.00	64.57	7.84
Social Communication	14	56	78	67.50	6.38
Social Motivation	14	51	88	65.21	12.46
Social Cognition	14	49	90	64.21	11.58
SCI	14	57	86	67.64	8.20
RRB	14	62	90	74.29	10.31
SSIS - Social Skills	14	59	99	82.71	11.36
QPQ	14	1	19	7.57	4.67
Caregiver Efficacy and Behavior					
SSM					
Confidence	14	2	4	3.21	.70
Stress	14	1	4	2.86	.77
PSEMAS	14	2.00	4.40	3.38	.69
MBRS					
RCO	15	2.67	4.50	3.39	.58
AA	15	2.00	3.50	2.78	.43
AO	15	1.00	3.00	2.18	.56
DR	15	2.00	3.50	2.78	.52
PS - Total	14	1.87	3.70	2.93	.48
Verbosity	14	1.14	4.85	3.41	.95
Laxness	14	1.91	5.18	3.05	1.06
Overreactivity	14	1.6	3.1	2.23	.37
Family Functioning					
CHAOS	14	31	43	37.57	3.67

Note. SSM = Social Skills Monitoring Social score; SRS-2 = Social Responsiveness Scale, second edition, SCI = Social Communication Index; SSIS = Social Skills Improvement System Social Skills Scale; QPQ = The Quality of Play Questionnaire; SSM = Social Skills Monitoring Confidence and Stress questions; PSEMAS = Parental Self-Efficacy in the Management of Asperger Syndrome total score; MBRS = The Maternal Behavioral Rating Scale, RCO = responsiveness, AA = affect, AO = achievement, and DR = directiveness, PS = Parenting Scale total score, laxness, overreactivity, and verbosity; CHAOS = Confusion, Hubbub, and Order Scale total score

Table 7

Comparison of Variables of Interest Across Timepoints

Measure	***Friedman Test*** *(x^2)*
Social Skills	
SSM	13.603*
SRS-2- total	3.62
Social Awareness	5.96
Social Communication	7.77*
Social Motivation	7.026
Social Cognition	4.62
SCI	8.39*
RRB	.792
SSIS – Social Skills	8.31*
QPQ	3.237
Caregiver Efficacy and Behavior	
SSM	
Confidence	6.00
Stress	2.053
PSEMAS	7.584
MBRS	
RCO	1.77
AA	3.33
AO	7.97*
DR	2.305
PS -total	4.54
Verbosity	1.70
Laxness	4.12
Overreactivity	11.8*
Family Functioning	
CHAOS	2.02

*$p<.05$

Note. SSM = Social Skills Monitoring Social score; SRS-2 = Social Responsiveness Scale, second edition, SCI = Social Communication Index; SSIS = Social Skills Improvement System Social Skills Scale; QPQ = The Quality of Play Questionnaire; SSM = Social Skills Monitoring Confidence and Stress questions; PSEMAS = Parental Self-Efficacy in the Management of Asperger Syndrome total score; MBRS = The Maternal Behavioral Rating Scale, RCO = responsiveness, AA = affect, AO = achievement, and DR = directiveness, PS = Parenting Scale total score, laxness, overreactivity, and verbosity; CHAOS = Confusion, Hubbub, and Order Scale total score

Table 8

Reliable Change Index and "Recovered" Participants

	Social Skills			**Caregiver Behavior**			**Family Func.**
	SRS-2- (Total, SCI, RRB, AWR, COG, MOT, COM)	SSIS	QPQ	PSEMAS	PS (total)	MBRS (RCO; AA; AO; DR)	CHAOS
GAC_1							
T1_Pre-treatment	75; 71; 85; 57; 63; 71; 75	68	--	3.27	3.43	3; 2.2; 1.25; 3.5	42
T2_post-treatment	68; 67; 73; 57; 68; 60; 68	82	7	3.067	3.5	3.17; 2.4; 1.25; 3.25	39
T3_Follow-Up	64; 64; 66; 54; 66; 62; 62	87	4	3.07	3.14	3.5; 2.9; 2.25; 3.25	42
RCI (Pre-post/Pre-FU)	-.97/-1.53;-.63/-1.10; **-2.83*/-4.48***; 0/-.83; 1.20/.72; **-3.66*/-3.00***; -1.19/**-2.20***	**2.44*/4.69***	--/--	-.60/-.59	.18/-.73	.34/1.00; .51/1.78; 0/**2.70***; -.63/-.63	-1.58/0
GAC_2							
T1_Pre-treatment	74; 72; 76; 73; 74; 56; 73	--	5	2.714	--	3.17; 3.2; 1; 2.75	--
T2_post-treatment	--; --; --; --; --; --; --	--	--	--	--	3.5; 2.4; 1; 2.5	--
T3_Follow-Up	61; 61; 62; 57; 59; 52; 65	87	--	29	3.14	2.83; 2.1; 1; 2.5	38
RCI (Pre-post/Pre-FU)	--/-1.80; --/-1.72; --/**-3.0***; --/**-4.44***; --/ -.72; --/ **-3.66***; --/ -1.36	--/--	--/7.00	--/.55	--/--	.66/-.68; -2.030/-2.79; 0/0; -.63/-.63	--/--
GAC_5							
T1_Pre-treatment	76; 75; 75; 67; 76; 62; 78	57	7	3.182	3.6	1.83; 2.5; 2.25; 4.5	35
T2_post-treatment	74; 74; 71; 73; 76; 56; 77	69	4	3.79	3.7	3; 2.6; 2.25; 3	37
T3_Follow-Up	71; 71; 68; 70; 74; 58; 72	71	5	4.4	4.85	3; 2.9; 2.25; 3	37
RCI (Pre-post/Pre-FU)	-.18/-.45; -.16/-.63; -1.073/-1.88; 1.51/.76; 0/ -.45; -1.89/ -1.26; -.17/ -.99	**2.10*/3.46***	**-4.20*/-2.80***	1.80/**3.63***	.25/3.16	**2.35*/2.35***; .25/1.015; 0/0; -3.76/-3.76	1.051/1.051
GAC_7							
T1_Pre-treatment	76; 77; 66; 68; 57; 89; 80	68	--	3.4	--	3; 2.9; 1; 2.75	--
T2_post-treatment	72; 73; 64; 59; 63; 78; 75	58	7	3	2.73	3.33; 2.4; 2.25; 2	44
T3_Follow-Up	68; 68; 64; 59; 53; 82; 68	64	5	3.6	3	4; 2.83; 1.75; 2	43
RCI (Pre-post/Pre-FU)	-.55/-1.11; -.65/-1.47; -.68/-.68; **-2.48***/-**2.48***; 1.51/-1.01; **-3.90*/ -2.48***; -.85/ -2.033*	-1.75/-.99	--/--	-1.19/.60	--/--	.66/**2.011***; -1.27/-.18; **3.37*/2.024*;** -1.88.-1.88	--/---
GAC_11							
T1_Pre-treatment	77; 77; 73; 79; 70; 69; 78	59	7	2.77	3.03	4; 3.5; 2.5; 2.5	45
T2_post-treatment	78; 76; 84; 71; 68; 74; 78	77	3	4.08	2.8	4.67; 3.4; 1.75; 3	39
T3_Follow-Up	76; 75; 78; 80; 68; 72; 74	80	5	3.73	2.14	4.5; 3.5; 3; 3	39
RCI (Pre-post/Pre-FU)	.091/-.091; -.15/-.29; 2.95/1.34; **-2.05***/.25; -.45/-.45; 1.58/.95; 0/-.66	**3.14*/5.19***	**-5.60***/-**2.80***	**3.90*/2.86***	-58/.28	1.35/1.01; -.25/0; -2.024/1.35; 1.25/1.25	**-3.15*/-3.15***
GAC_14							
T1_Pre-treatment	74; 69; 90; 60; 68; 72; 67	82	12	4.5	3.53	5; 3.8; 2.5; 3	38

T2_post-treatment	--; --; --; --; --; --; --	--	--	--	--	4.67; 3.6; 2.5; 3	--
T3_Follow-Up	64; 61; 76; 60; 49; 60; 66	99	3	2.56	3.29	3; 2.8; 1.5; 3	33
RCI (Pre-post/Pre-FU)	--/.91; --/ -1.17; --/ **-3.76***; --/0; --/**-4.26***; 0/ **-3.79***; --/ -.17	--/**4.20***	--/-**12.61***	--/-5.77	--/-.61	-.66/-4.022; -.51/-2.53; 0/-2.70; 0/0	--/-**2.63***
GAC_15							
T1_Pre-treatment	89; 88; 87; 82; 90; 78; 79	73	16	2.23	3.87	4.67; 3.2; 2; 2.5	31
T2_post-treatment	--; --; --; --; --; --; --	--	--	--	--	3.33; 2.8; 2; 2.5	--
T3_Follow-Up	60; 59; 62; 57; 53; 52; 63	87	8	3.5	3.6	3.33; 2.8; 2.5; 2.5	34
RCI (Pre-post/Pre-FU)	--; **-4.022***; --/ **-4.54***; --/**-5.89***; --/**-6.95***; --/**-8.88***; --/ **-8.66***; --/ **-2.71***	--/**3.46***	--/-**11.21***	--/**3.78***	--/-.68	-2.70/-2.70; -1.015/-1.015; 0/1.35; 0/0	--/1.58
GAC_18							
T1_Pre-treatment	85; 82; 90; 71; 89; 90; 72	57	23	2.36	2.2	3; 2.2; 1; 2	34
T2_post-treatment	--; --; --; --; --; --; --	--	--	--	--	3.67; 3; 2; 3	--
T3_Follow-Up	88; 86; 90; 71; 90; 88; 78	59	19	4.27	3.43	3.33; 3; 2; 3	31
RCI (Pre-post/Pre-FU)	--/.27; --/.58; --/0; --/0; --/.22; --/ -.63; --/.99	--/.49	--/**-5.60***	--/**5.68***	--/3.11	1.35/.66; **2.030*/ 2.030*; 2.70*/ 2.70*; 2.51*/2.51***	--/-1.58
GAC_19							
T1_Pre-treatment	90; 90; 90; 80; 90; 89; 83	47	--	.4	--	3; 3; 1.5; 3	37
T2_post-treatment	70; 67; 80; 63; 71; 70; 61	67	3	2.73	--	--; --; --; --	43
T3_Follow-Up	78; 74; 90; 63; 78; 78; 67	78	1	2	3.14	2.67; 2.4; 2.5; --	41
RCI (Pre-post/Pre-FU)	-1.82/-1.10; **-3.60*/-2.50*;** -2.68/0; **-4.28*/-4.28***; **-4.26*/-2.69*; -6.00*/ -3.47***; **-3.64*/ -2.65***	**3.49*/7.66***	--/--	**6.93*/4.76***	**-2.23***/1.26	--/-.66; --/-1.52; --/**2.70*;** --/--	3.15/2.10
GAC_20							
T1_Pre-treatment	70; 78; 71; 67; 68; 90; 73	85	--	2.36	--	3; 3; 1.5; 3.5	--
T2_post-treatment	--; --; --; --; --; --; --	--	--	--	--	2.66; 2.8; 3.5; 3.5	--
T3_Follow-Up	72; 73; 66; 70; 65; 79; 70	82	11	2.79	4.7	3.33; 3; 2.5; 3.5	38
RCI (Pre-post/Pre-FU)	--/.28; --/ -.78; --/ -1.18; --/.83; --/ -.72; --/ -**3.66***; --/ -.51	--/-.74	--/--	--/1.30	--/--	-.68/.66; -.51/0; **5.40*/2.70*;** 0/0	--/--
VT_2							
T1_Pre-treatment	62; 61; 68; 51; 65; 56; 61	87	8	3.6	1.9	4; 3.4; 2; 2	40
T2_post-treatment	64; 62; 68; 57; 63; 67; 58	89	13	2.88	2.17	3.66; 3.4; 2.5; 3	44
T3_Follow-Up	--; --; --; --; --; --; --	--	--	--	--	4; 3.2; 2.5; 3	--
RCI (Pre-post/Pre-FU)	.28/--; .16/--; 0/--; 1.67/--; -.48/--; 3.66/--; -.53/--	.35/--	7.00/--	-2.14/11	.68/--	-.68/0; 0/-.51; 1.35/ 1.35; **2.51*/2.51***	2.10/--
VT_3							
T1_Pre-treatment	74; 74; 71; 73; 72; 77; 68	65	16	3.36	3.2	2.67; 2.8; 1; 2	36
T2_post-treatment	65; 64; 70; 63; 63; 63; 63	92	2	3.82	2.4	3; 2.4; 1.5; 3	33
T3_Follow-Up	63; 60; 76; 57; 61; 60; 58	91	9	3.5	3.14	3; 2; 1.5; 3	34

RCI (Pre-post/Pre-FU)	-1.25/-1.53; -1.56/**-2.19***; -.24/1.18; **-2.78***/**-4.45***; **-2.16***/**-2.64***; **-4.66***/ -5.66; -.85/ -1.69	**4.71*/6.42***	**-19.61*/-9.81***	1.36/.42	**-2.02***/-.15	.66/.66; -1.015/-2.30; 1.35/1.35; **-2.51*/2.51***	-1.58/-1.051
VT_4							
T1_Pre-treatment	67; 64; 78; 78; 59; 60; 60	84	10	1.9	2.33	4.67; 3.6; 3; 2.5	37
T2_post-treatment	75; 71; 90; 80; 58; 59; 76	89	7	3.75	1.57	3.66; 3; 2.5; 3	36
T3_Follow-Up	68; 64; 80; 75; 53; 51; 71	91	4	3	1.14	4.33; 3.17; 3; 3	38
RCI (Pre-post/Pre-FU)	1.11/.14; 1.14/0; 4.09/.68; .55/-.83; -.25/-1.51; -0.35/ **-3.19***; 2.83/1.95	.87/1.73	**-4.20*/-8.40***	**5.51*/3.27***	-1.92/-**3.01***	-2.031/-.68; -1.52/-1.091; -1.35/0; 1.25 /1.25	-.53/.53
VT_6							
T1_Pre-treatment	77; 74; 86; 74; 73; 62; 76	88	16	3.27	2.8	2.67; 2.6; 1; 2	29
T2_post-treatment	74; 71; 82; 71; 68; 62; 74	82	9	3.29	2.13	3.67; 3; 1.5; 3	37
T3_Follow-Up	78; 74; 90; 68; 73; 66; 75	90	11	4.08	2.57	2.67; 2.17; 2.5; 3	36
RCI (Pre-post/Pre-FU)	-.27/.091; -.44/0; -1.073/1.073; -.76/-1.51; -1.12/0; 0/ 1.26; -.33/ -.17	-1.048/.49	**-9.81*/-7.00***	.071/**2.42***	-1.69/-.58	**2.011***/0; 1.015/-1.091; 1.35/**4.048***; **2.51*/2.51***	4.20/3.68
VT_8							
T1_Pre-treatment	54; 53; 58; 51; 56; 49; 54	92	8	3.5	2.97	3; 2.8; 1.5; 2	44
T2_post-treatment	60; 58; 72; 54; 61; 55; 57	90	11	3.79	3.23	4.66; 3; 1; 3	38
T3_Follow-Up	60; 57; 72; 63; 57; 53; 56	92	11	3.93	4	3.33; 3; 2; 3	42
RCI (Pre-post/Pre-FU)	.55/.55; .78/.63; 3.76/3.76; .76/3.022; 1.12/.22; 1.89/1.26; .50/.33	-.35/0	4.20/4.20	.86/1.28	.66/2.61	**3.33***/.66; .51/.51; -1.35/1.35; **2.51*/2.51***	-3.15/0
Percentage Improved (%)	Total: 0 / 7.14; SCI: 20 / 21.43; RRB: 20 / 28.57; AWR: 40 / 35.71; COG: 20 / 35.71; MOT: 40 / 57.14; COM: 10 / 28.57	50 / 53.85	71.42 / 80	30 / 50	22.22 / 9.10	RCO: 21.43 / 13.33; AA: 13.33/ 6.67: AO: 21.43 / 40 DR: 35.71 / 33.33	11.11 / 18.18
Percentage Recovered	0 on all scales	0	0	0	10% from entry to exit	7.14% on AO from entry to exit	0

* RCI = Sig if > or <1.96 (depending on direction of scale)

Note. SRS-2 = Social Responsiveness Scale, second edition, SCI = Social Communication Index; SSIS = Social Skills Improvement System Social Skills Scale; QPQ = The Quality of Play Questionnaire; SSM = Social Skills Monitoring Confidence and Stress questions; PSEMAS = Parental Self-Efficacy in the Management of Asperger Syndrome total self-efficacy; MBRS = The Maternal Behavioral Rating Scale, RCO = responsiveness, AA = affect, AO = achievement, and DR = directiveness, PS = Parenting Scale total score, laxness, overreactivity, and verbosity; CHAOS = Confusion, Hubbub, and Order Scale total score

Table 9

Mean Level Changes between Eligibility and Endpoint/Follow-up for SSM, PS, and CHAOS scores

Group	**SSM Social Skills**	**PS total**	**CHAOS total**
Group 1	.317	.065	-.247
Group 2	.375	.335	-.413
Group 3	.523*	-.076	-.103
Group 4	.526	-.597*	-.363

* *p<.05*
** *p<.01*

Note. SSM = Social Skills Monitoring Social Skills Questionnaire; PS = Parenting Scale Total Score; CHAOS = Confusion, Hubbub, and Order Scale Total Score

Table 10
SMA: Best-fitting slopes for SSM, PS, and CHAOS scores

Group	SSM Social Skills	PS total	CHAOS total
Group 1	-.711 (1)* .701 (2)* .682 (4)* .723 (5)**	-.440 (1)	.177 (1)
Group 2	-.686 (1)** .692 (2)** .692 (4)** .693 (5)**	-.338 (2)	-.335 (3)
Group 3	-.597 (1)* .628 (2)** .464 (3)* .636 (4)** .594 (5)*	-.222 (5)	-.199 (3)
Group 4	.741 (2)* .738 (4)* .711 (5)*	-.593 (2)* -.605 (3)** -.630 (4)** -.551 (5)*	-.232 (3)

* $p<.05$
** $p<.01$

Note. SSM = Social Skills Monitoring Social Skills Questionnaire; PS = Parenting Scale Total Score; CHAOS = Confusion, Hubbub, and Order Scale Total Score; Number in parentheses indicates the best-fitting slope vector based on being significant at *p*

Table 11

Multivariate Process Change Analysis for SMA for SSM, PS, and CHAOS scores

Group	SSM Social Skills, PS Total Score	SSM Social Skills, CHAOS Total Score	PS Total Score, SSM Social Skills	PS Total Score, CHAOS Total Score	CHAOS Total Score, SSM Social Skills	CHAOS Total Score, PS Total Score
Group 1	.55 (-3)** .58 (-2)**	.55 (-3)** .58 (-2)**	.57 (-3)** .57 (-2)**	.57 (-3)** .57 (-2)**	-.47 (-3)* -.52 (-2)* -.47 (-1)*	-.47 (-3)* -.52 (-2)* -.47 (-1)*
Group 2	.40 (-3)* .55 (-2)**	.40 (-3)* .55 (-2)**	.26 (-3)	-.26 (-3)	-.41 (0)*	-.41 (0)*
Group 3	.37 (-3)* .44 (-2)* .49 (-1)** .52 (0)**	.37 (-3)* .44 (-2)** .49 (-1)** .52 (0)** .36 (1)*	.17 (-3)	.17 (-3)	-.23 (2)	-.23 (2)
Group 4	-.37 (-2)	-.37 (-2)	-.37 (-2)*	-.37 (-2)	-.37 (-2)	-.37 (-2)*

** p<.05 with Bonferroni correction*
*** p<.01 with Bonferroni correction*

Note. SSM = Social Skills domain on Social Skills Monitoring Questionnaire; PS = Parenting Scale Total Score; CHAOS = Confusion, Hubbub, and Order Scale Total Score; Number in parentheses indicates significant lag

Figures

Figure 1

CONSORT Diagram

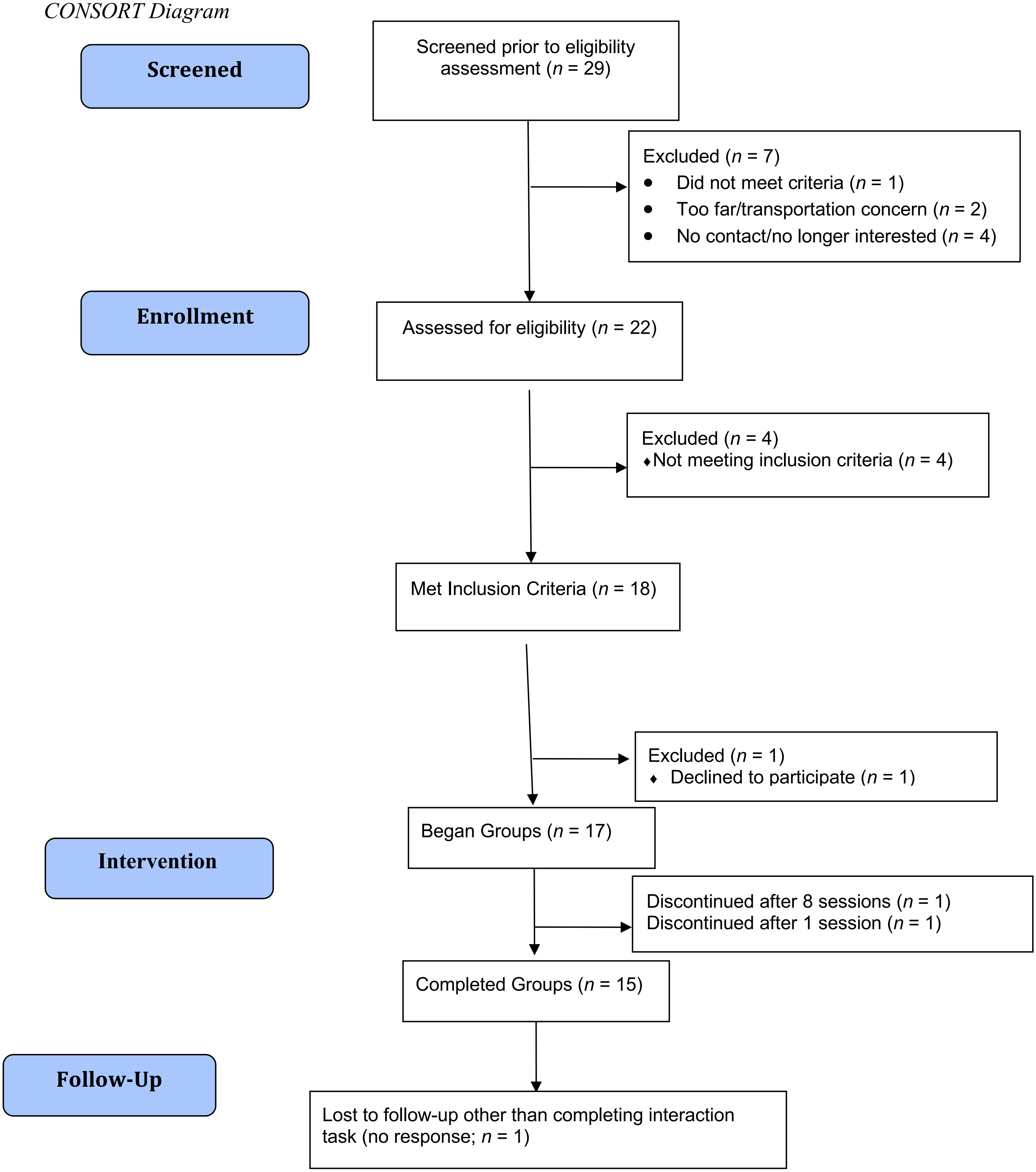


Figure 2

SMA Model Vector Slopes (1-5, from left to right)

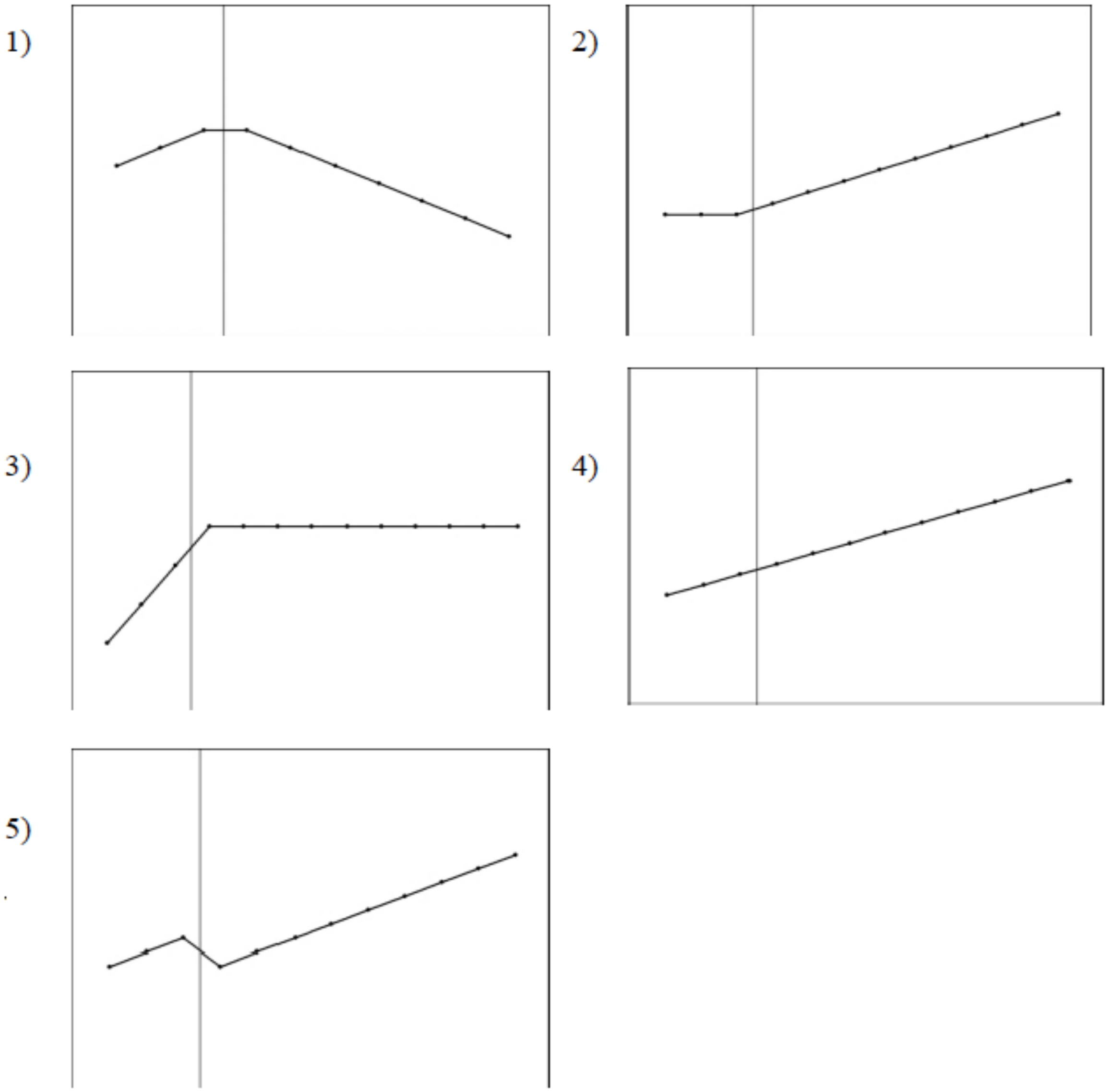


Figure 3

SSM SMA model slopes (Group 1-4, from left to right)

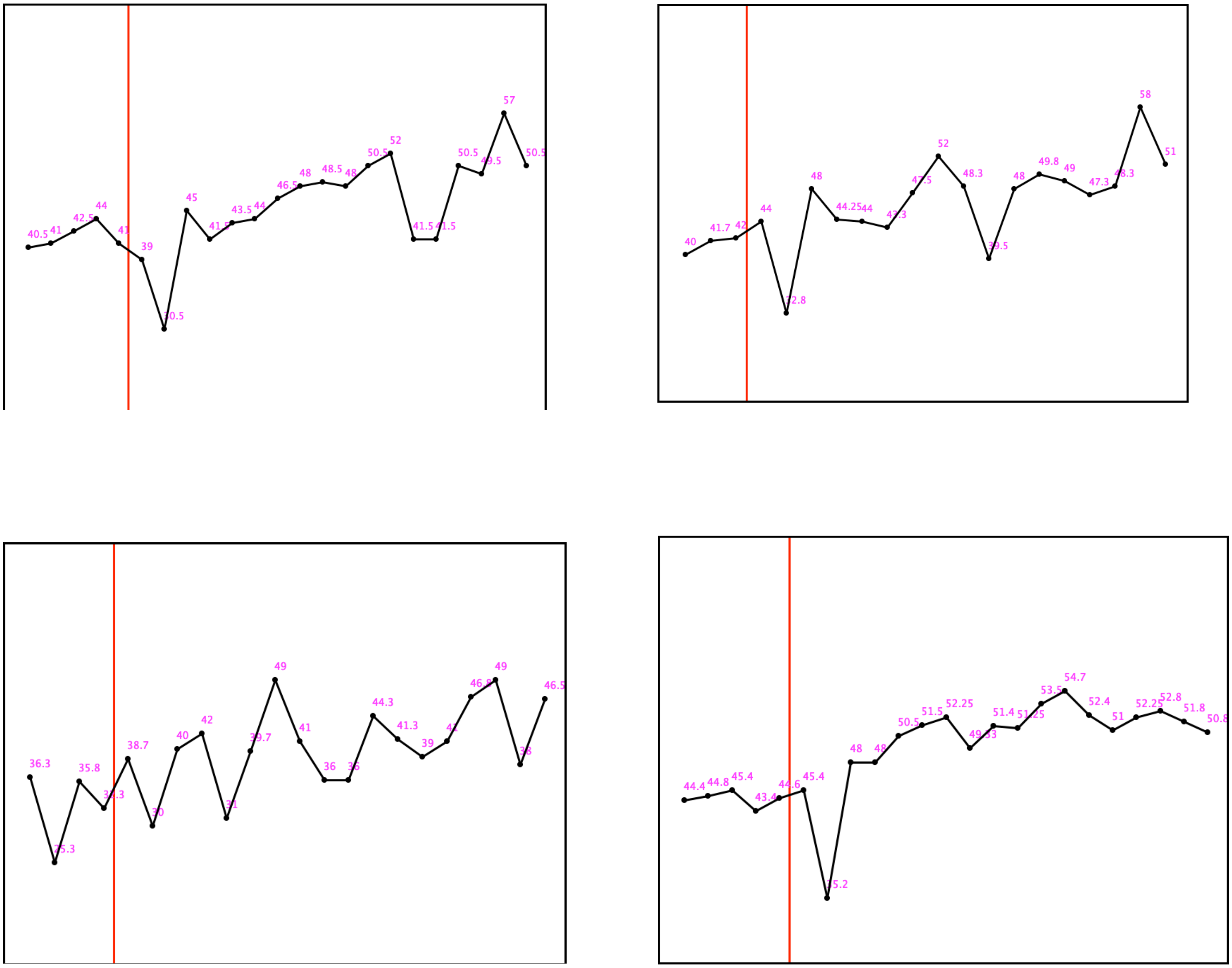


Figure 4

PS SMA model slopes (Group 1-4, from left to right)

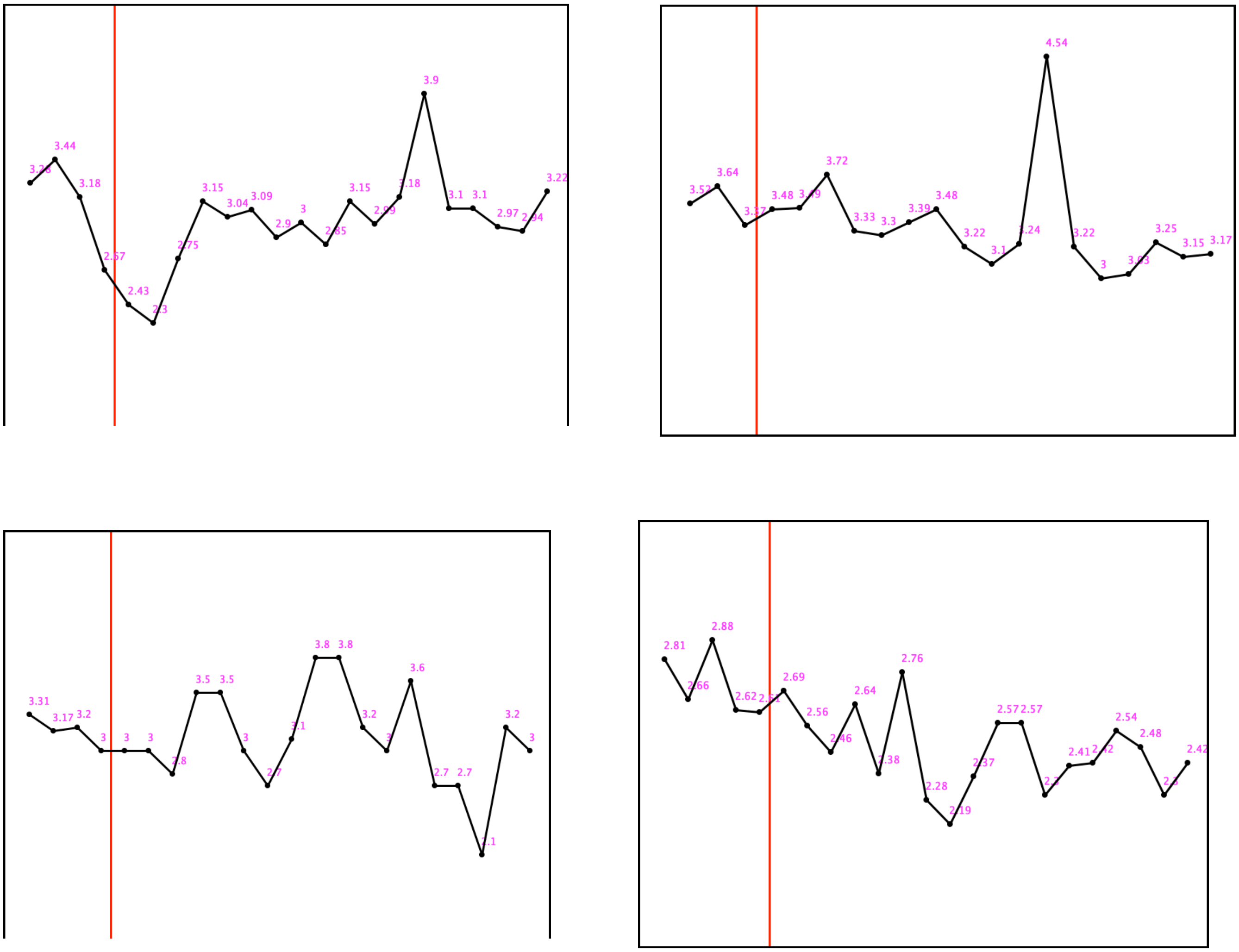


Figure 5

CHAOS SMA model slopes (Group 1-4, from left to right).

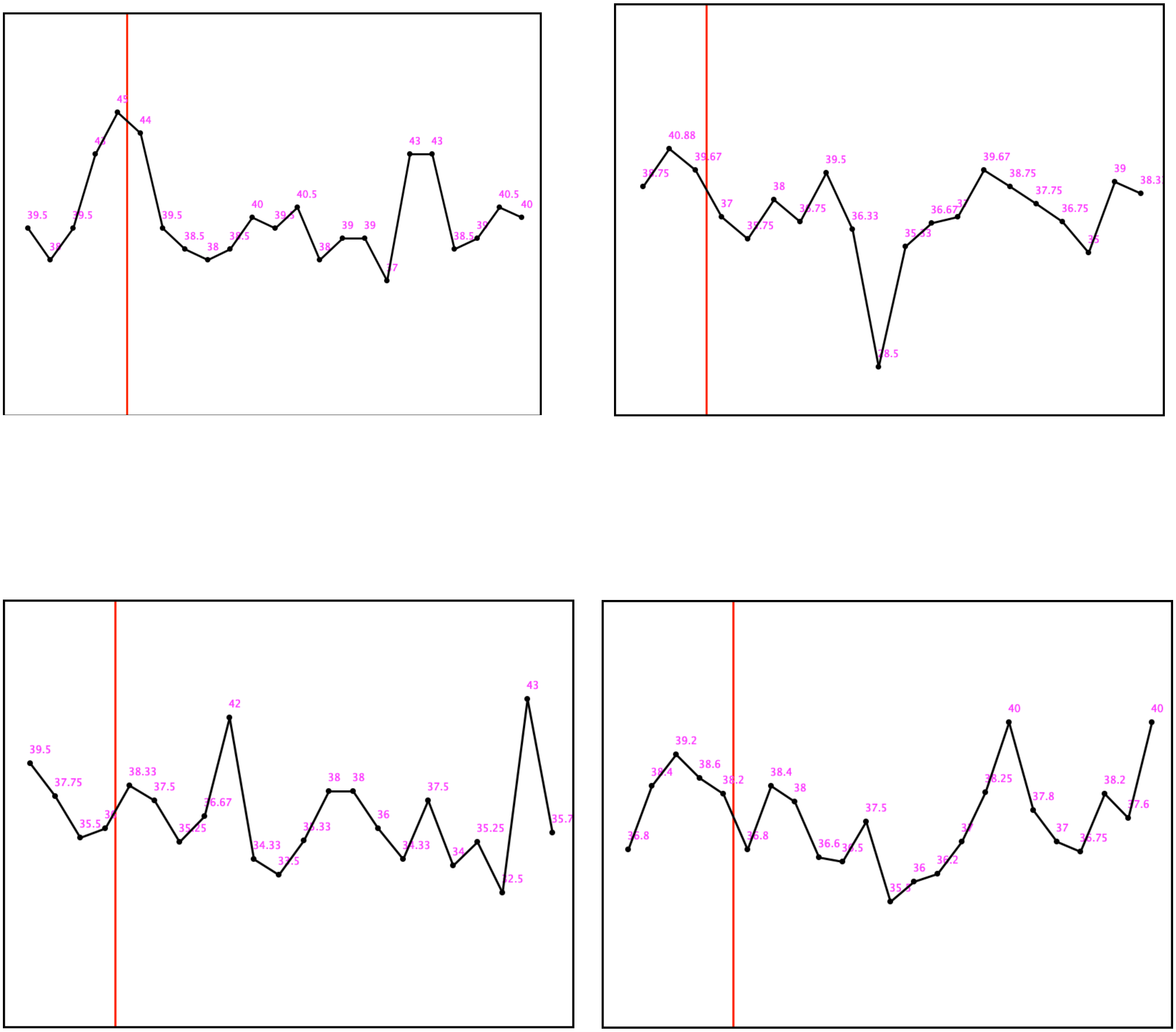


Figure 6

SSM Social Skills domain for all groups across study timepoints

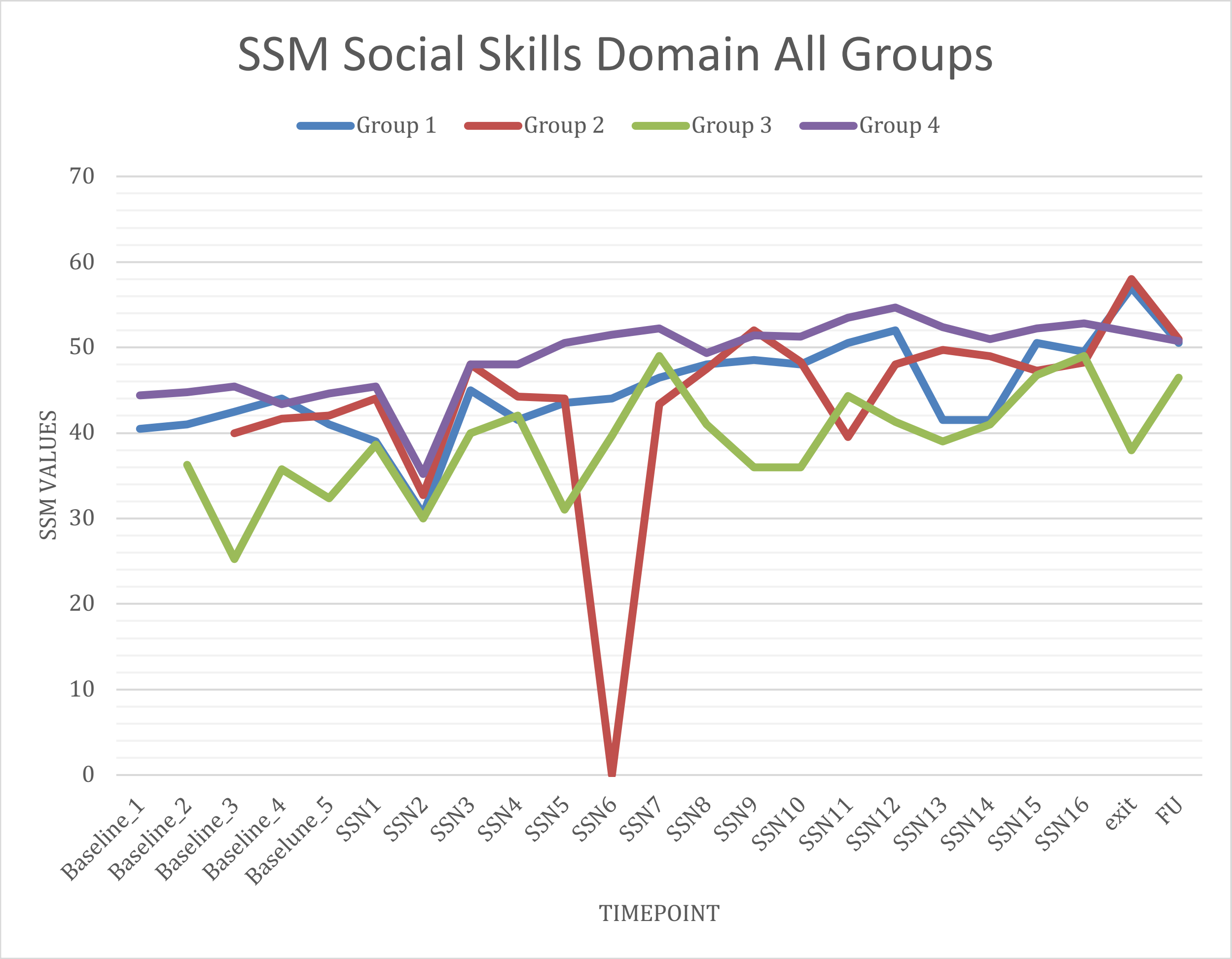


Figure 7

PS Total Score for all groups across study timepoints

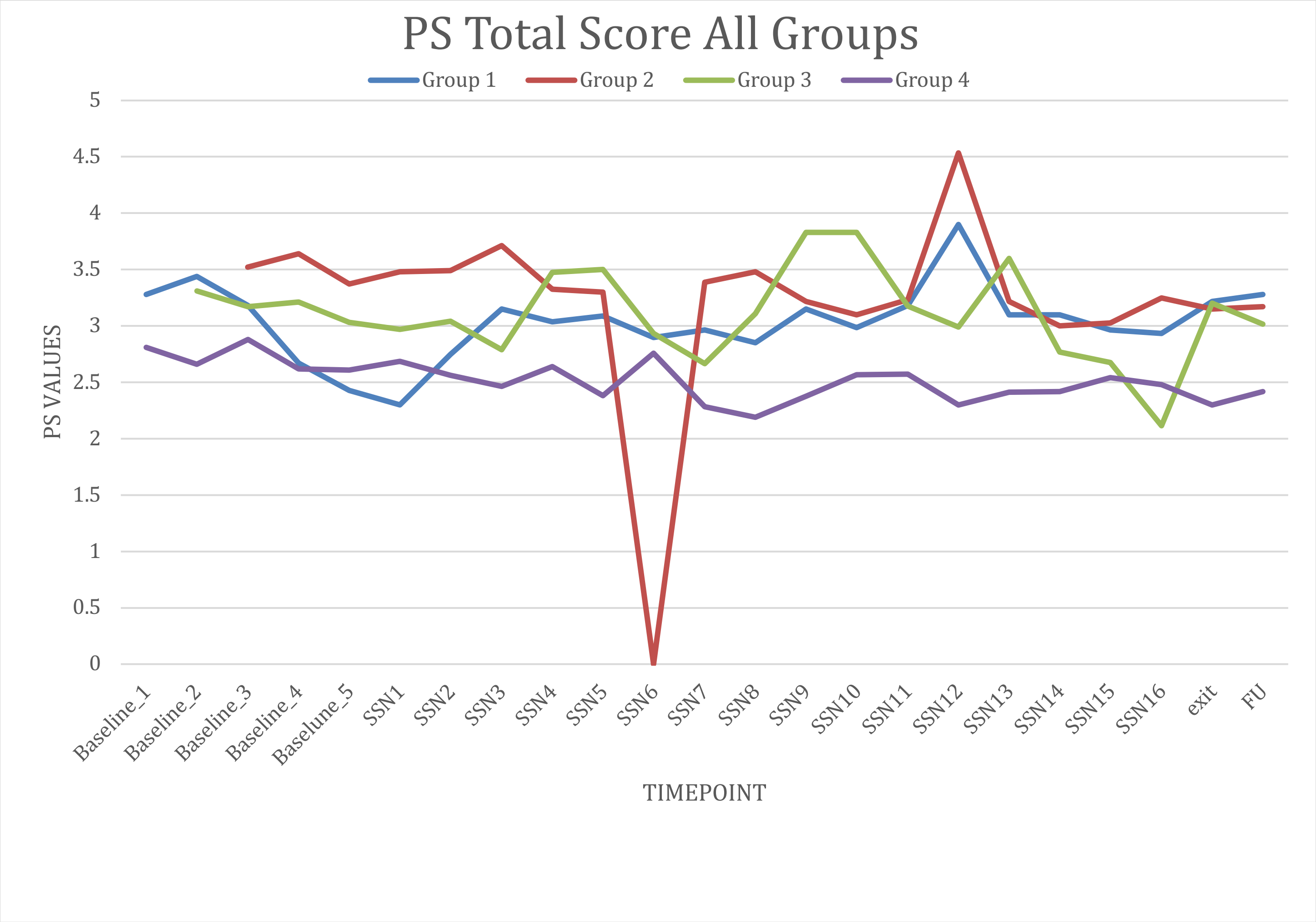
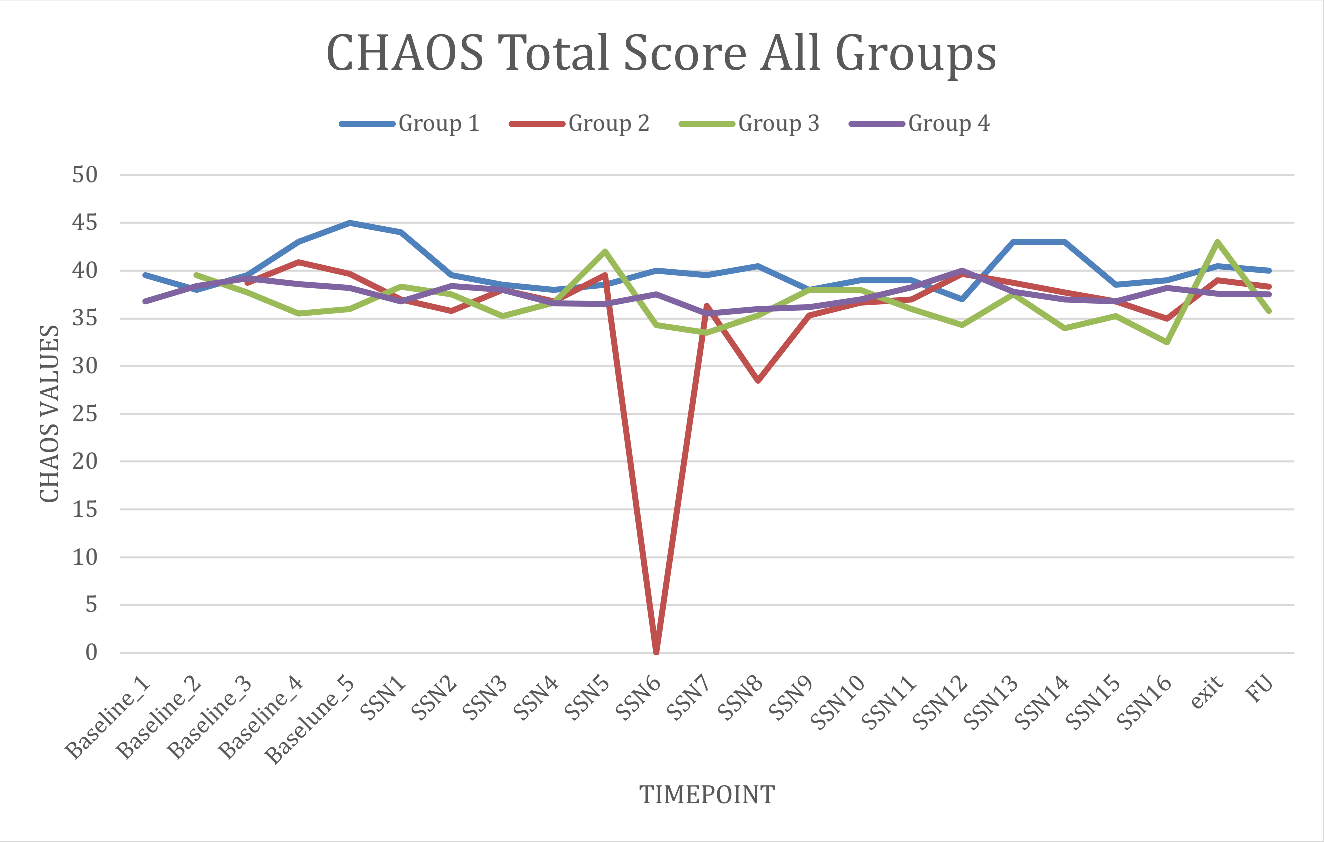


Figure 8

CHAOS Total Score for all groups across study timepoints



Appendices

Appendix A

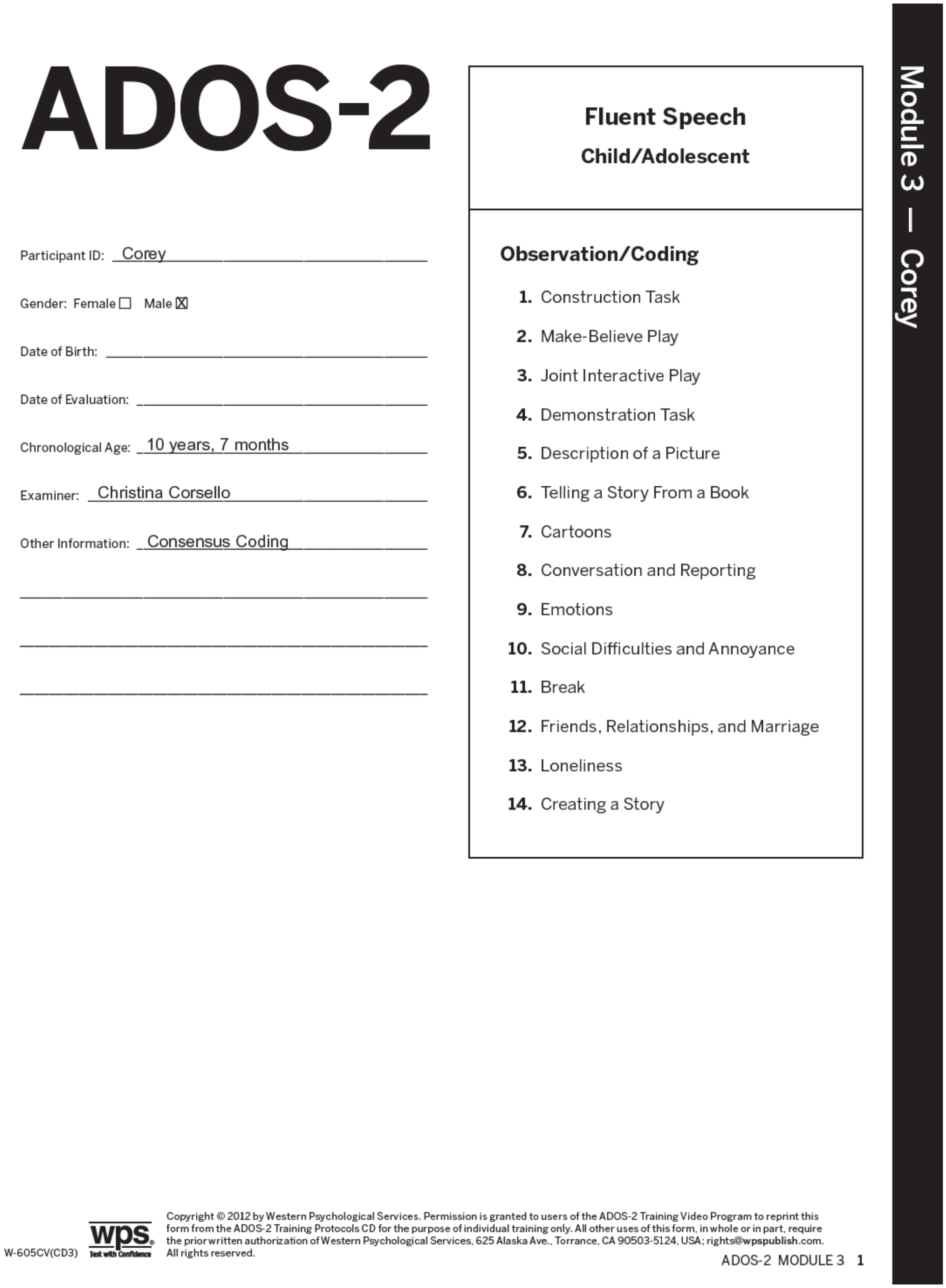
Timeline of Measures

Construct/ Measure	Entry/ Pre-Tx	Mid	Weekly	Exit/ Post-Tx	Follow-up
Sample Characterization					
ADOS-2	X				
Demographics Form	X				
KBIT-2	X				
VABS-III	X				
Social Skills					
Social Skills Monitoring	X	X	X	X	X
SRS-2	X	X		X	X
SSIS	X	X		X	X
QPQ	X	X		X	X
Caregiver Efficacy and Behavior					
PSEMAS	X	X		X	X
MBRS	X	X		X	X
PS	X	X	X	X	X
Family Functioning					
CHAOS	X	X	X	X	X
Treatment Quality					
Fidelity Rating Form			X		

Notes. ADOS-2 = Autism Diagnostic Observation Schedule, Second Edition; KBIT-2 = Kaufman Brief Intelligence Test; VABS-III = Vineland Adaptive Behavior Scale – Third Edition; SRS-2 = Social Responsiveness Scale, 2nd Edition; SSIS = Social Skills Improvement System; QPQ = The Quality of Play Questionnaire; PSEMAS = Parental Self-Efficacy in the Management of Asperger Syndrome; MBRS = Maternal Behavioral Rating Scale; PS = Parenting Scale; CHAOS = Confusion, Hubbub, and Order Scale

Appendix B

Autism Diagnostic Observation Schedule, Second Edition



ADOS-2

Fluent Speech

Child/Adolescent

Module 3 — Corey

Participant ID: Corey

Gender: Female ☐ Male ☒

Date of Birth:

Date of Evaluation:

Chronological Age: 10 years, 7 months

Examiner: Christina Corsello

Other Information: Consensus Coding

Observation/Coding

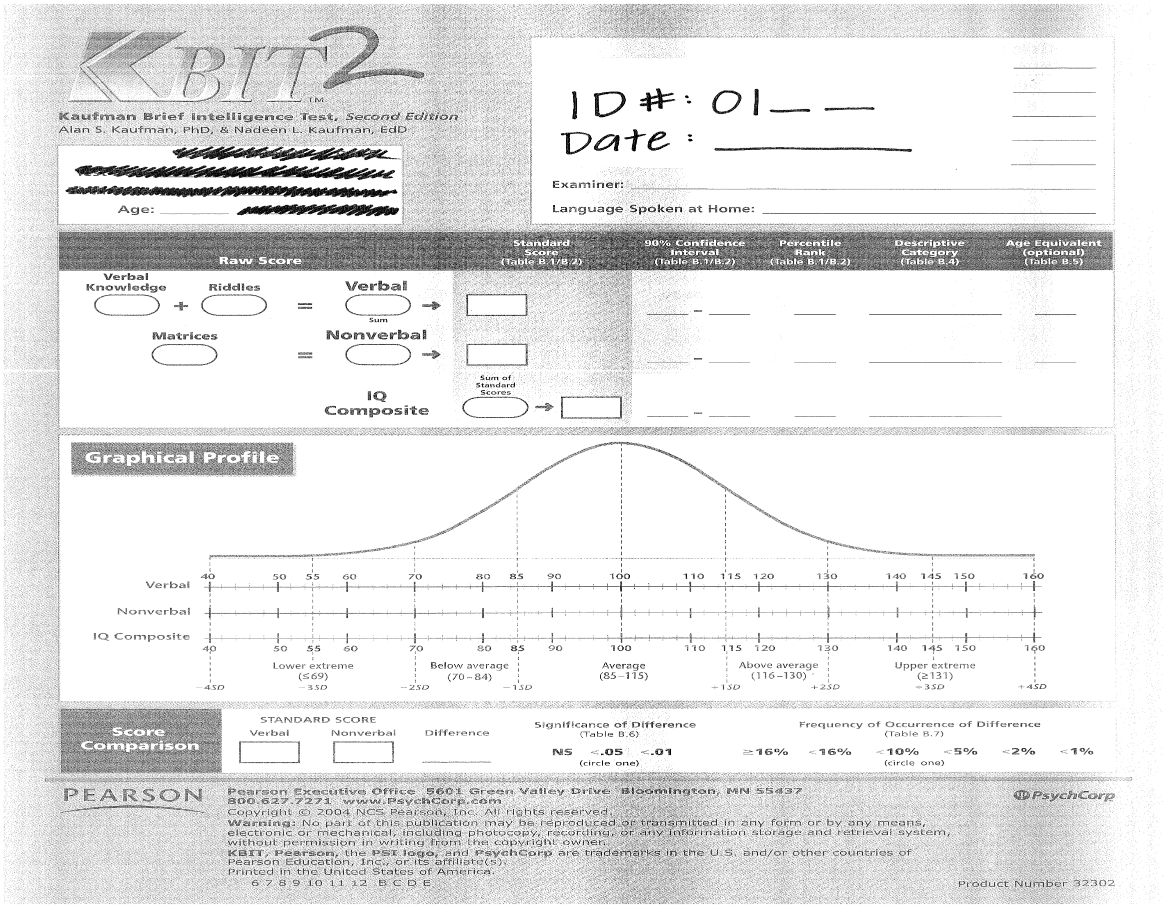
1. Construction Task
2. Make-Believe Play
3. Joint Interactive Play
4. Demonstration Task
5. Description of a Picture
6. Telling a Story From a Book
7. Cartoons
8. Conversation and Reporting
9. Emotions
10. Social Difficulties and Annoyance
11. Break
12. Friends, Relationships, and Marriage
13. Loneliness
14. Creating a Story

W-605CV(CD3) wps Test with Confidence

ADOS-2 MODULE 3 1

Appendix C

Kaufman Brief Intelligence Test, Second Edition



KBIT2™

Kaufman Brief Intelligence Test, ***Second Edition***
Alan S. Kaufman, PhD, & Nadeen L. Kaufman, EdD

[redacted]
Age: ________ [redacted]

ID #: 01__ __
Date : ________

Examiner: ________

Language Spoken at Home: ________

Raw Score				Standard Score (Table B.1/B.2)	90% Confidence Interval (Table B.1/B.2)	Percentile Rank (Table B.1/B.2)	Descriptive Category (Table B.4)	Age Equivalent (optional) (Table B.5)
Verbal Knowledge ○ + Riddles ○	=	Verbal ○ Sum	→	☐	____ – ____	____	________	____
Matrices ○	=	Nonverbal ○	→	☐	____ – ____	____	________	____
		IQ Composite	Sum of Standard Scores ○ →	☐	____ – ____	____	________	

Graphical Profile

Score Comparison

STANDARD SCORE				
Verbal	Nonverbal	Difference	Significance of Difference (Table B.6)	Frequency of Occurrence of Difference (Table B.7)
☐	☐	________	NS <.05 <.01 (circle one)	≥16% <16% <10% <5% <2% <1% (circle one)

PEARSON
Pearson Executive Office 5601 Green Valley Drive Bloomington, MN 55437
800.627.7271 www.PsychCorp.com

Printed in the United States of America.
6 7 8 9 10 11 12 B C D E
PsychCorp
Product Number 32302

Appendix D

Demographics Form

Child's name: ____

Date of Birth: _________________ Age: _____________ Gender: M_____ F_____

Race: Asian: _____ Black: ______ Hispanic: _____ White: ______ Other: ______

Is your child: Right handed: ____ Left handed: ____ Mixed handedness: _____ D/K_____

Form completed by: _____________________Relationship to child: _________________

Address: ____

Phone Number: (Home) _____________ (Cell) ____________(Work) ______________

Email address: ____

BACKGROUND INFORMATION

Please list all individuals who live in the home and their relationship to your child:

Name: Relationship: Age: Gender:

If both biological parents are not living in the home, please explain:

If child is adopted, please describe circumstances of adoption, and provide any information regarding the biological parents:

Date of Adoption: _____________ Age of Adoption: __________ Place of Adoption: ____________

MOTHER'S NAME: ________________________ Date of Birth: ________

Biological mother: ___ Stepmother:____ Adoptive Mother:___ Foster Mother:____ Other:____

Education:
- ___ Completed7th grade or less
- ___ Completed some high school
- ___ Graduated from high school
- ___ Graduated from trade school, business school or specialized training program
- ___ Completed an Associate degree
- ___ Graduated from college
- ___ Completed graduate school

Employment: Is mother/caregiver employed outside the home? Yes _____ No _____

If yes, what is her job title? ____

Company's Name: ____

No. of Hrs/Week: _______________

FATHER'S NAME: ____________________________Date of Birth: __________

Biological father: ____ Stepfather:____ Adoptive Father:___ Foster Father:____ Other:_______

Education:
- ___ Completed7th grade or less
- ___ Completed some high school
- ___ Graduated from high school
- ___ Graduated from trade school, business school or specialized training program
- ___ Completed an Associate degree
- ___ Graduated from college
- ___ Completed graduate school

Employment: Is father/caregiver employed outside the home? Yes _____ No _____

If yes, what is his job title? ____

Company's Name: ____

No. of Hrs/Week: _______________

Income: What is your estimated gross family income? ____

CHILD DEVELOPMENTAL HISTORY

Note: If your child is adopted or in your foster care, please complete the following section to the best of your knowledge and leave unknown information blank.

Pregnancy and Prenatal Development: Was this pregnancy planned? Yes ___ No ___

Please indicate any illnesses or complications experienced by the child's mother during pregnancy:

_____ Rash
_____High blood pressure
_____Headaches
_____Bleeding
_____Abdominal pain
_____Blurred vision
_____Dizzy spells
_____Toxemia
_____Measles
_____Diabetes
_____Very puffy face
_____Convulsions
_____High fever
_____Viral infection
_____Excessive weight gain
_____Excessive vomiting
_____Kidney disease
_____Thyroid condition
_____Asthma
_____Surgery
_____Marked swelling of hands/feet
_____None of the above

Any accidents during pregnancy: Yes ___ No ___

If yes, specify: ____

____

Other problems during pregnancy: Yes ___ No ___

If yes, specify: ____

____

Please indicate below any special diet the mother had during pregnancy:

____

Please circle the trimester(s) during which the mother smoked during this pregnancy:

Do not know Did Not First Second Third

Please circle the trimester(s) during which the mother drank alcohol during this pregnancy:

Do not know Did Not First Second Third

Please circle the trimester(s) during which the mother drank coffee during this pregnancy:

Do not know Did Not First Second Third

Please circle the trimester(s) during which the mother was exposed to x-ray during this pregnancy:

Do not know Did Not First Second Third

Please indicate below any medications the mother took during pregnancy: (None ___________)

	Name of Drug	*Started in what mo. of pregnancy:*	*For how long:*
Control Nausea			
Control Fluid Retention			
Help Sleep			
Help Stay Awake			
Help Relieve Anxiety			
Help Relieve Depression			
Help Control Allergies			
Other			

If the mother had severe emotional distress prior to this pregnancy, please explain:

If the mother had severe emotional distress during to this pregnancy, please explain:

If the mother had severe emotional distress after to this pregnancy, please explain:

Please specify whether any of the following difficulties occurred during the baby's first few months at home:

Excessive crying: Yes _____ No_____

Feeding problems Yes_____ No_____

Dislike of normal handling: Yes_____ No_____

Unusual muscle activity: Yes_____ No_____

Sleeping problems: Yes_____ No_____

Stiffness, rigidity, floppiness: Yes_____ No_____

Other: __________ Please explain: ____

Has child has ever been in an accident resulting in serious injury? Yes___ No___

If yes, please explain:

Hospitalizations: Has child ever had any medical hospitalizations: Yes____ No_____

Age: Length of stay: Reason for hospitalization:

Medications:

Please indicate whether or not your child has taken medication within the last 3 months and/or is currently taking any medications. Please then specify the name of the medication and the following: dosage, time of day the medicine is taken, and who prescribed the medication.

Type of Medication	Taken within last 3 months?	Currently taking?	Name of medication	Dosage & time of day	Who prescribed the medication
ADHD medication	Y / N	Y / N			
Anti-Depressant	Y / N	Y / N			
Anti-Anxiety	Y / N	Y / N			
Anti-Seizure	Y / N	Y / N			
Allergy/Asthma	Y / N	Y / N			
Other	Y / N	Y / N			
Other	Y / N	Y / N			

Food Restrictions:

1. Has your child been on any special diet or had food restrictions over the past 3 months?

Yes___ No___

1.A. If yes, please specify:

____

____

2. Is your child currently on a special diet or have food restrictions?

Yes___ No___

Family Medical History:

Do any members of the family have a medical or psychological problem? Yes: ______ No: _____

If yes, list this person's name and describe briefly:

Name: __________________________ Concern: ______________________________________

____

Name: __________________________ Concern: ______________________________________

____

Name: __________________________ Concern: ______________________________________

____

Hearing, Speech & Language History:

Has your child's hearing been screened? Yes___ No___ Date of the last hearing screening: ________
Please indicate if the testing was normal: Yes___ No____
If not, what was found?
____

Has your child's vision been screened? Yes___ No___ Date of last vision screening: _____________
Please indicate if the testing was normal: Yes ____ No____
If not, what was found?
____

Is English the only language spoken in the home? Yes____ No_____
If no, specify other languages:
____

Did your child have difficulty with any of the following: Yes____ No ____
____sucking ____ nursing _____ regurgitation of liquids/solids
____chewing ____ choking/gagging _____ excessive time to drink bottle
If yes, please explain:
____
____

Did your child's speech learning ever seem to stop for a period of time? Yes, ____ No ______
Please explain:
____
____

How does your child communicate his/her needs?
Gestures_____ Sounds_____ One or two words _____ phrases _____ sentences________ Sign language______
Other: ____

Do you question your child's ability to understand directions and conversations? Yes____ No____
If yes, please explain:
____
____
____

When your child speaks, can your child be understood by:

	Usually	**Sometimes**	**Rarely**	**N/A**
Parents:	_________	_________	________	_________
Siblings:	_________	_________	________	_________
Grandparents:	_________	_________	________	_________
Playmates:	_________	_________	________	_________
Other adults:	_________	_________	________	_________

Does your child get 'stuck' on words and/or repeat sounds or words? Yes ____ No ____

If so, describe:
____
____

Does your child have any other language/communication difficulties not listed above? Yes ___ No __
If so, describe: ____
____

Do you think your child hears adequately? Yes___ No___
If no, please explain: ____
____

Do you think his/her hearing is constant or does it vary? Yes ___ No___
Please describe: ____
____

Does your child's voice seem normal to you? Yes___ No___
If no, please describe:____
____

Does your child have difficulty with coordination? Yes___ No___
If yes, please describe:____
____

Does your child lose balance or fall easily? Yes___ No___
If yes, please describe:____
____

SOCIAL AND BEHAVIORAL HISTORY

Does your child tend to play alone or with other children?
____

Age of playmates: ____

How does your child get along with other children? ________________________________
____
____

With adults?____

If yes, how does your child get along with his/her brothers and sisters? (e.g., enjoys their company, argues or fights frequently, plays cooperatively, etc.)

Is it difficult to discipline you child? (Explain as fully as possible)

Would you describe your child as happy or unhappy?
____

Is your child unusually quiet?
____

Is your child unusually active?
____

Has your child ever expressed suicidal tendencies or behaviors to harm self? Yes____ No____

If yes, please explain:

Has your child ever shown violent behavior? Yes____ No____
If yes, please explain:
____

List any sensory sensitivity that your child might have (e.g., becomes very upset if__, very preoccupied with__)

List any of your child’s fears that you feel are excessive:

Does your child have difficulty concentrating?

Does your child have difficulty sleeping?

List any repetitive behaviors or intense preoccupations your child may have:

List some of your child’s favorite interests, hobbies or games:

Describe any other concerns you have about your child’s behavior, including any current problems or concerns for which you would like help:

Please list professionals or clinics with whom you’ve consulted about the problem.

EDUCATIONAL HISTORY

Is your child currently attending day care, school or an educational program? Yes ______ No ______

School Name: ____
Date he/she started attending this school: _____________ Current grade: ________________

If day care or preschool, how many days per week? ________________________________

Has your child ever been held back in school? Yes ___ No ____ If so, what grades? _______

If applicable, what kinds of grades does your child make? ___________________________

How does your child feel about school? ____

Has your child ever been evaluated psychoeducationally by a school or private consultant (include any diagnosis given)? Yes___ No____

Date: Evaluated by: Outcome/Diagnosis:

PSYCHIATRIC/EMOTIONAL

Has child previously been diagnosed (by anyone) with (please circle all that apply):

Autistic Disorder ………………………………………….	Yes	No
Asperger Syndrome……………………………..………	Yes	No
Pervasive Developmental Disorder (PDD-NOS)… ………	Yes	No
Autism Spectrum Disorder……………………………...	Yes	No
Generalized Anxiety disorder …………………………...	Yes	No
Separation Anxiety disorder……………………………….	Yes	No
Obsessive compulsive disorder…………………………...	Yes	No
Social anxiety disorder or social phobia………………….	Yes	No
Selective mutism ……….…………………………………...	Yes	No
Specific phobia……………………………………………	Yes	No
Panic disorder……………………………………………..	Yes	No
Posttraumatic stress disorder………………………………	Yes	No
Any other anxiety disorder…………………………………	Yes	No
Oppositional anxiety disorder………………………………	Yes	No
Conduct disorder……………………………………………	Yes	No
Attention deficit hyperactivity disorder……………………	Yes	No
Depression/Dysthymia…………………………………….	Yes	No
Disruptive mood dysregulation disorder……………………	Yes	No

Does child have any other psychiatric, neurodevelopmental, or medical diagnosis? Yes____ No___
If yes, please specify diagnosis:
____

If your child has ever been treated or received special help for learning or emotional problems not listed elsewhere on this form, please describe. Please also indicate any past diagnosis that has been given.

Date: Evaluated by: Outcome/Diagnosis:

SERVICES

Please circle any special programs in which your child is currently enrolled in school:

A. None
B. Counseling
Name: ____

C. Learning disabled (LD) or resource Areas: _________________________________
Number of hrs/day ________
D. Seriously emotionally disturbed (SED)
E. Chapter 1 Reading
F. Chapter 1 Math
G. Other Health Impaired (OHI)
H. Developmentally Delayed

Please complete the following for any therapies your child has received.

A. Speech/Language Therapy: Yes ☐ No ☐
For what reasons/problems____
Of hrs per week____________ Date it started: ________ Date it ended ________
Group_________ and/or Individual_______ Private______ and/or School system _______
Was it Effective?____
Provider: ____

B. Occupational Therapy: Yes ☐ No ☐
For what reasons/problems____
Of hrs per week____________ Date it started: ________ Date it ended ________
Group_________ and/or Individual______ Private_____ and/or School system _________
Was it effective?____
Provider: ____

C. Applied Behavioral Analysis: Yes ☐ No ☐
For what reasons/problems____
Of hrs per week____________ Date it started: ________ Date it ended ________
Group_________ and/or Individual________ Private______ and/or School system ________
Was it effective?____
Provider: ____

D. Play Therapy: Yes ☐ No ☐
For what reasons/problems____
Of hrs per week____________ Date it started: ________ Date it ended ________
Group_________ and/or Individual________ Private______ and/or School system ________
Was it effective?____
Provider: ____

E. Music Therapy: Yes ☐No ☐
For what reasons/problems____
Of hrs per week____________ Date it started: ________ Date it ended ________
Group_________ and/or Individual________ Private______ and/or School system ________
Was it effective?____

Provider: ____

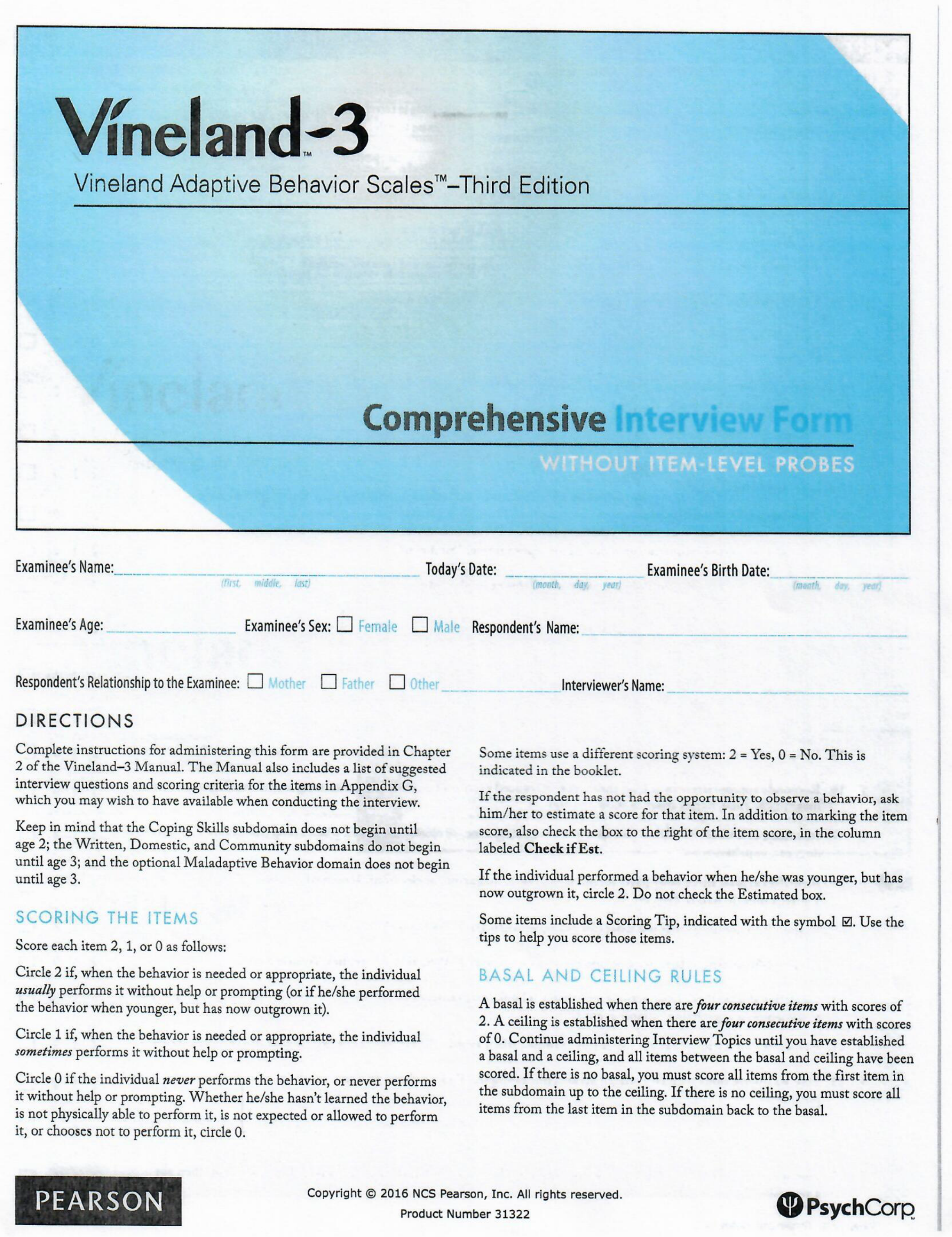
F. Social Skills Therapy: Yes ☐ No ☐
For what reasons/problems____
Of hrs per week____________ Date it started: ________ Date it ended ________
Group_________ and/or Individual________ Private______ and/or School system ________
Was it effective?____
Provider: ____

G. Individual Therapy: Yes ☐ No ☐
For what reasons/problems____
Of hrs per week________ Date it started: ________ Date it ended ________
Private_________ and/or School system _____________

Was it effective?____
Provider: ____
H. Other services:

Appendix E

Vineland Adaptive Behavior Scale – Third Edition (VABS-3)



Vineland-3

Vineland Adaptive Behavior Scales™–Third Edition

Comprehensive Interview Form

WITHOUT ITEM-LEVEL PROBES

Examinee's Name:__________________ (first, middle, last) Today's Date: __________ (month, day, year) Examinee's Birth Date: __________ (month, day, year)

Examinee's Age: __________ Examinee's Sex: ☐ Female ☐ Male Respondent's Name: __________________

Respondent's Relationship to the Examinee: ☐ Mother ☐ Father ☐ Other __________ Interviewer's Name: __________________

DIRECTIONS

Complete instructions for administering this form are provided in Chapter 2 of the Vineland–3 Manual. The Manual also includes a list of suggested interview questions and scoring criteria for the items in Appendix G, which you may wish to have available when conducting the interview.

Keep in mind that the Coping Skills subdomain does not begin until age 2; the Written, Domestic, and Community subdomains do not begin until age 3; and the optional Maladaptive Behavior domain does not begin until age 3.

SCORING THE ITEMS

Score each item 2, 1, or 0 as follows:

Circle 2 if, when the behavior is needed or appropriate, the individual *usually* performs it without help or prompting (or if he/she performed the behavior when younger, but has now outgrown it).

Circle 1 if, when the behavior is needed or appropriate, the individual *sometimes* performs it without help or prompting.

Circle 0 if the individual *never* performs the behavior, or never performs it without help or prompting. Whether he/she hasn't learned the behavior, is not physically able to perform it, is not expected or allowed to perform it, or chooses not to perform it, circle 0.

Some items use a different scoring system: 2 = Yes, 0 = No. This is indicated in the booklet.

If the respondent has not had the opportunity to observe a behavior, ask him/her to estimate a score for that item. In addition to marking the item score, also check the box to the right of the item score, in the column labeled **Check if Est.**

If the individual performed a behavior when he/she was younger, but has now outgrown it, circle 2. Do not check the Estimated box.

Some items include a Scoring Tip, indicated with the symbol ☑. Use the tips to help you score those items.

BASAL AND CEILING RULES

A basal is established when there are ***four consecutive items*** with scores of 2. A ceiling is established when there are ***four consecutive items*** with scores of 0. Continue administering Interview Topics until you have established a basal and a ceiling, and all items between the basal and ceiling have been scored. If there is no basal, you must score all items from the first item in the subdomain up to the ceiling. If there is no ceiling, you must score all items from the last item in the subdomain back to the basal.

PEARSON

Product Number 31322

PsychCorp

Appendix F

Social Skills Monitoring

Please read each statement and select one response that best aligns with your experience in the past week.

1. Did you schedule and have a play date with a playmate from the play group?
   a. Yes
   b. No
2. If so, did plan for the playdate using the five W's?
   a. Yes
   b. No

3. Did you review rules for using an inside voice?
   a. Yes
   b. No

4. Did you practice having your child use an inside voice?
   a. Yes
   b. No
      If so, how many times? ___________

5. Did you review rules for staying in your own space?
   a. Yes
   b. No

6. Did you practice having your child stay in their own space?
   a. Yes
   b. No
      If so, how may times?___________
7. Did you review rules for asking and giving help?
   a. Yes
   b. No

8. Did you practice having your child ask for and give help?
   a. Yes
   b. No
      If so, how may times?__________

9. Rate your child's current skill level as it pertains to **listening and following directions**

1	2	3	4
Very poor. Not at all able.	Poor. Somewhat able.	Good. Fairly able.	Very good and able.

10. Rate your child's current skill level as it pertains to **asking and using names**

1	2	3	4
Very poor. Not at all able.	Poor. Somewhat able.	Good. Fairly able.	Very good and able.

11. Rate your child's current skill level as it pertains to **greeting friends**

1	2	3	4
Very poor. Not at all able.	Poor. Somewhat able.	Good. Fairly able.	Very good and able.

12. Rate your child’s current skill level as it pertains to **sharing**

1	2	3	4
Very poor. Not at all able.	Poor. Somewhat able.	Good. Fairly able.	Very good and able.

13. Rate your child’s current skill level as it pertains to **asking for and giving turns when playing with peers**

1	2	3	4
Very poor. Not at all able.	Poor. Somewhat able.	Good. Fairly able.	Very good and able.

14. Rate your child’s current skill level as it pertains to **keeping cool**

1	2	3	4
Very poor. Not at all able.	Poor. Somewhat able.	Good. Fairly able.	Very good and able.

15. Rate your child’s current skill level as it pertains to **being a good sport**

1	2	3	4
Very poor. Not at all able.	Poor. Somewhat able.	Good. Fairly able.	Very good and able.

16. Rate your child’s current skill level as it pertains to **showing and telling**

1	2	3	4
Very poor. Not at all able.	Poor. Somewhat able.	Good. Fairly able.	Very good and able.

17. Rate your child’s current skill level as it pertains to **asking a friend to play**

1	2	3	4
Very poor. Not at all able.	Poor. Somewhat able.	Good. Fairly able.	Very good and able.

18. Rate your child’s current skill level as it pertains to **joining a game**

1	2	3	4
Very poor. Not at all able.	Poor. Somewhat able.	Good. Fairly able.	Very good and able.

19. Rate your child’s current skill level as it pertains to **asking to play something different**

1	2	3	4
Very poor. Not at all able.	Poor. Somewhat able.	Good. Fairly able.	Very good and able.

20. Rate your child’s current skill level as it pertains to **asking for and giving help**

1	2	3	4
Very poor. Not at all able.	Poor. Somewhat able.	Good. Fairly able.	Very good and able.

21. Rate your child’s current skill level as it pertains to **staying in his or her own space**

1	2	3	4
Very poor. Not at all able.	Poor. Somewhat able.	Good. Fairly able.	Very good and able.

22. Rate your child’s current skill level as it pertains to **using an inside voice**

1	2	3	4
Very poor. Not at all able.	Poor. Somewhat able.	Good. Fairly able.	Very good and able.

23. Rate the frequency of disruptive behaviors (e.g., interrupting, yelling, crying, etc.) demonstrated by your child in the past week

1	2	3	4
My child demonstrated disruptive behaviors very frequently.	My child demonstrated a moderate amount of disruptive behaviors.	My child demonstrated a mild amount of disruptive behaviors.	My child did not demonstrate disruptive behaviors.

24. Rate the severity of the disruptive behaviors demonstrated by your child in the past week

1	2	3	4
Very severe and disruptive.	Severe and mildly disruptive.	Mild severity and not very disruptive.	Not at all severe or disruptive.

25. Rate the frequency of avoidance behaviors (e.g., avoiding social interactions, hiding, etc.) demonstrated by your child in the past week

1	2	3	4
My child demonstrated avoidance behaviors very frequently.	My child demonstrated a moderate amount of avoidance behaviors.	My child demonstrated a mild amount of avoidance behaviors.	My child did not demonstrate avoidance behaviors.

26. Rate the severity of the avoidant behaviors demonstrated by your child in the past week

1	2	3	4
Very severely avoidant and isolated.	Severely avoidant and moderately isolated.	Mild avoidance; Not very isolated.	Not at all avoidant or isolated.

27. Rate your confidence in social coaching your child over the past week

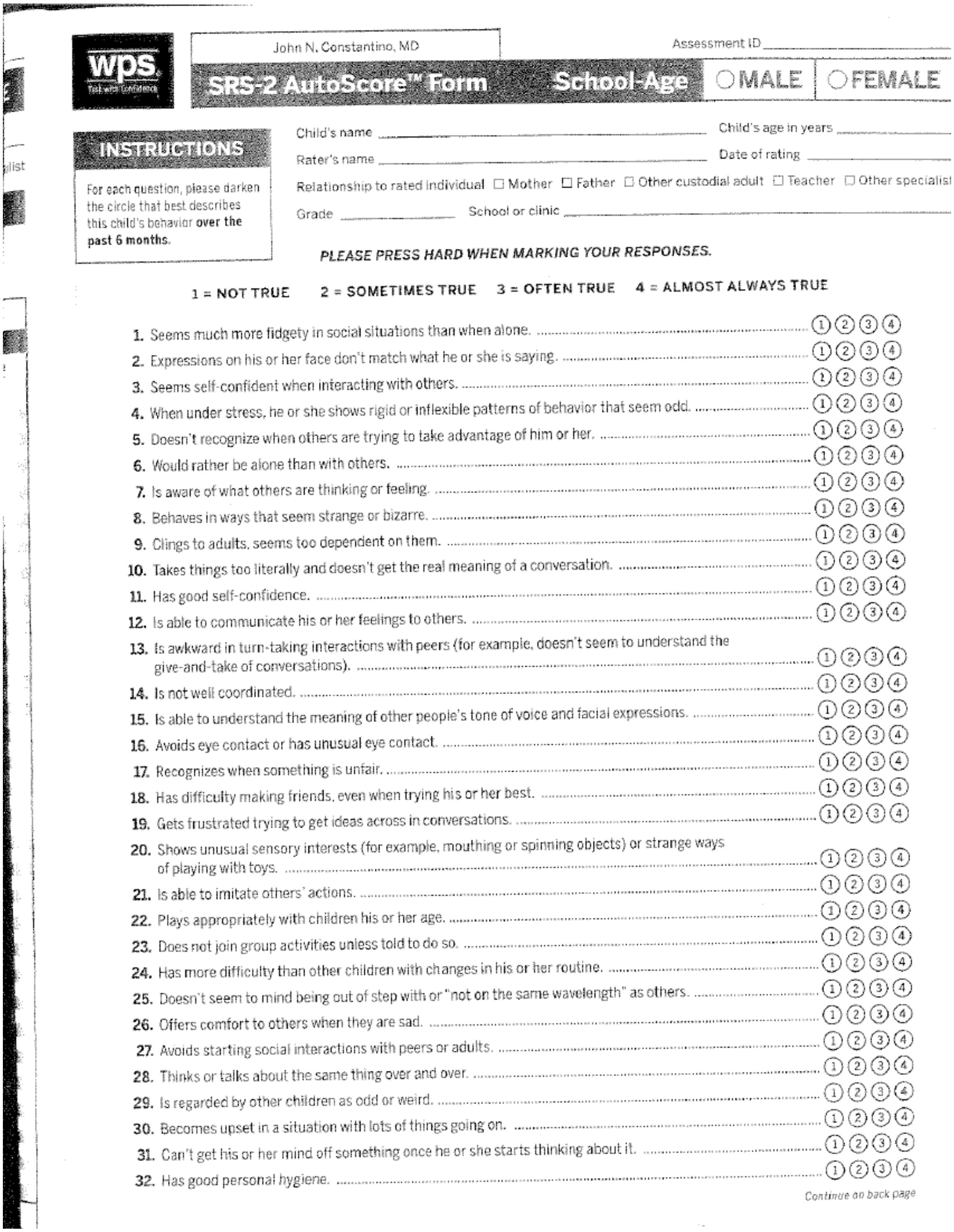
1	2	3	4
Completely incompetent at social coaching. No confidence.	Somewhat incompetent at social coaching. Very little confidence.	Fairly competent at social coaching. More confident than not.	Very competent at social coaching. Extremely confident.

28. Rate your stress as it pertains to interactions with your child in the past week

1	2	3	4
Interactions with my child were extremely stressful.	Interactions with my child were moderately stressful.	Interactions with my child were mildly stressful.	Interactions with my child were not stressful.

Appendix G

Social Responsiveness Scale, Second Edition



wps. Test with Confidence

John N. Constantino, MD

Assessment ID ____________

SRS-2 AutoScore™ Form **School-Age** ○ MALE ○ FEMALE

INSTRUCTIONS

For each question, please darken the circle that best describes this child's behavior **over the past 6 months.**

Child's name ____________ Child's age in years ____________

Rater's name ____________ Date of rating ____________

Relationship to rated individual ☐ Mother ☐ Father ☐ Other custodial adult ☐ Teacher ☐ Other specialist

Grade ____________ School or clinic ____________

PLEASE PRESS HARD WHEN MARKING YOUR RESPONSES.

1 = NOT TRUE **2 = SOMETIMES TRUE** **3 = OFTEN TRUE** **4 = ALMOST ALWAYS TRUE**

1. Seems much more fidgety in social situations than when alone. ① ② ③ ④
2. Expressions on his or her face don't match what he or she is saying. ① ② ③ ④
3. Seems self-confident when interacting with others. ① ② ③ ④
4. When under stress, he or she shows rigid or inflexible patterns of behavior that seem odd. ① ② ③ ④
5. Doesn't recognize when others are trying to take advantage of him or her. ① ② ③ ④
6. Would rather be alone than with others. ① ② ③ ④
7. Is aware of what others are thinking or feeling. ① ② ③ ④
8. Behaves in ways that seem strange or bizarre. ① ② ③ ④
9. Clings to adults, seems too dependent on them. ① ② ③ ④
10. Takes things too literally and doesn't get the real meaning of a conversation. ① ② ③ ④
11. Has good self-confidence. ① ② ③ ④
12. Is able to communicate his or her feelings to others. ① ② ③ ④
13. Is awkward in turn-taking interactions with peers (for example, doesn't seem to understand the give-and-take of conversations). ① ② ③ ④
14. Is not well coordinated. ① ② ③ ④
15. Is able to understand the meaning of other people's tone of voice and facial expressions. ① ② ③ ④
16. Avoids eye contact or has unusual eye contact. ① ② ③ ④
17. Recognizes when something is unfair. ① ② ③ ④
18. Has difficulty making friends, even when trying his or her best. ① ② ③ ④
19. Gets frustrated trying to get ideas across in conversations. ① ② ③ ④
20. Shows unusual sensory interests (for example, mouthing or spinning objects) or strange ways of playing with toys. ① ② ③ ④
21. Is able to imitate others' actions. ① ② ③ ④
22. Plays appropriately with children his or her age. ① ② ③ ④
23. Does not join group activities unless told to do so. ① ② ③ ④
24. Has more difficulty than other children with changes in his or her routine. ① ② ③ ④
25. Doesn't seem to mind being out of step with or "not on the same wavelength" as others. ① ② ③ ④
26. Offers comfort to others when they are sad. ① ② ③ ④
27. Avoids starting social interactions with peers or adults. ① ② ③ ④
28. Thinks or talks about the same thing over and over. ① ② ③ ④
29. Is regarded by other children as odd or weird. ① ② ③ ④
30. Becomes upset in a situation with lots of things going on. ① ② ③ ④
31. Can't get his or her mind off something once he or she starts thinking about it. ① ② ③ ④
32. Has good personal hygiene. ① ② ③ ④

Continue on back page

PLEASE PRESS HARD WHEN MARKING YOUR RESPONSES.

1 = NOT TRUE 2 = SOMETIMES TRUE 3 = OFTEN TRUE 4 = ALMOST ALWAYS TRUE

33. Is socially awkward, even when he or she is trying to be polite. ①②③④

34. Avoids people who want to be emotionally close to him or her. ①②③④

35. Has trouble keeping up with the flow of a normal conversation. ①②③④

36. Has difficulty relating to adults. ①②③④

37. Has difficulty relating to peers. ①②③④

38. Responds appropriately to mood changes in others (for example, when a friend's or playmate's mood changes from happy to sad). ①②③④

39. Has an unusually narrow range of interests. ①②③④

40. Is imaginative, good at pretending (without losing touch with reality). ①②③④

41. Wanders aimlessly from one activity to another. ①②③④

42. Seems overly sensitive to sounds, textures, or smells. ①②③④

43. Separates easily from caregivers. ①②③④

44. Doesn't understand how events relate to one another (cause and effect) the way other children his or her age do. ①②③④

45. Focuses his or her attention to where others are looking or listening. ①②③④

46. Has overly serious facial expressions. ①②③④

47. Is too silly or laughs inappropriately. ①②③④

48. Has a sense of humor, understands jokes. ①②③④

49. Does extremely well at a few tasks, but does not do as well at most other tasks. ①②③④

50. Has repetitive, odd behaviors such as hand flapping or rocking. ①②③④

51. Has difficulty answering questions directly and ends up talking around the subject. ①②③④

52. Knows when he or she is talking too loud or making too much noise. ①②③④

53. Talks to people with an unusual tone of voice (for example, talks like a robot or like he or she is giving a lecture). ①②③④

54. Seems to react to people as if they are objects. ①②③④

55. Knows when he or she is too close to someone or is invading someone's space. ①②③④

56. Walks in between two people who are talking. ①②③④

57. Gets teased a lot. ①②③④

58. Concentrates too much on parts of things rather than seeing the whole picture. For example, if asked to describe what happened in a story, he or she may talk only about the kind of clothes the characters were wearing. ①②③④

59. Is overly suspicious. ①②③④

60. Is emotionally distant, doesn't show his or her feelings. ①②③④

61. Is inflexible, has a hard time changing his or her mind. ①②③④

62. Gives unusual or illogical reasons for doing things. ①②③④

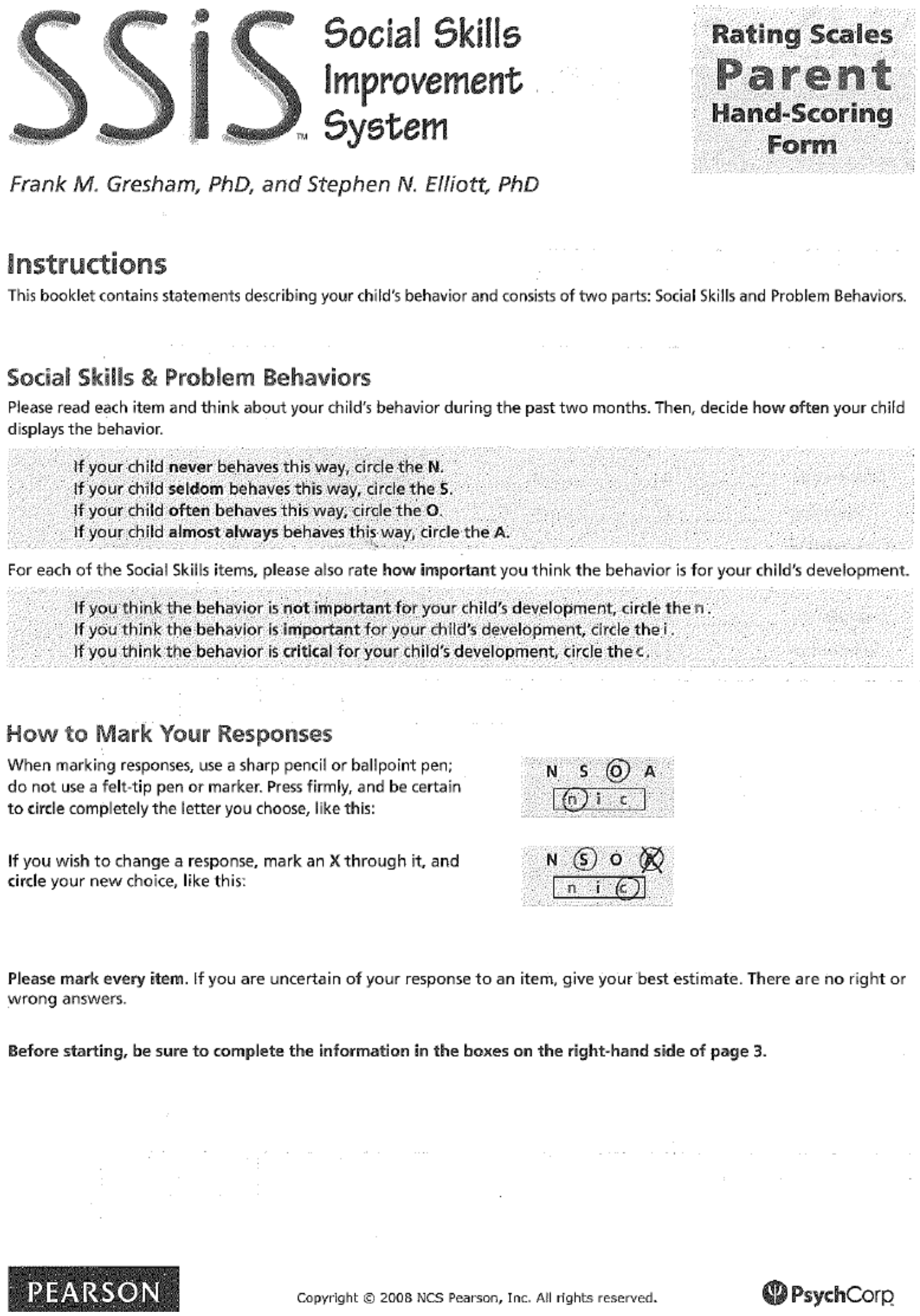
63. Touches others in an unusual way (for example, he or she may touch someone just to make contact and then walk away without saying anything). ①②③④

64. Is too tense in social settings. ①②③④

65. Stares or gazes off into space. ①②③④

Appendix H

Social Skills Improvement System



SSiS™ Social Skills Improvement System

Rating Scales
Parent
Hand-Scoring Form

Frank M. Gresham, PhD, and Stephen N. Elliott, PhD

Instructions

This booklet contains statements describing your child's behavior and consists of two parts: Social Skills and Problem Behaviors.

Social Skills & Problem Behaviors

Please read each item and think about your child's behavior during the past two months. Then, decide **how often** your child displays the behavior.

If your child **never** behaves this way, circle the **N**.
If your child **seldom** behaves this way, circle the **S**.
If your child **often** behaves this way, circle the **O**.
If your child **almost always** behaves this way, circle the **A**.

For each of the Social Skills items, please also rate **how important** you think the behavior is for your child's development.

If you think the behavior is **not important** for your child's development, circle the n.
If you think the behavior is **important** for your child's development, circle the i.
If you think the behavior is **critical** for your child's development, circle the c.

How to Mark Your Responses

When marking responses, use a sharp pencil or ballpoint pen; do not use a felt-tip pen or marker. Press firmly, and be certain to **circle** completely the letter you choose, like this:

N S [✓ O] A
[✓ n] i c

If you wish to change a response, mark an **X** through it, and **circle** your new choice, like this:

N [✓ S] O ~~A~~
n i [✓ c]

Please mark every item. If you are uncertain of your response to an item, give your best estimate. There are no right or wrong answers.

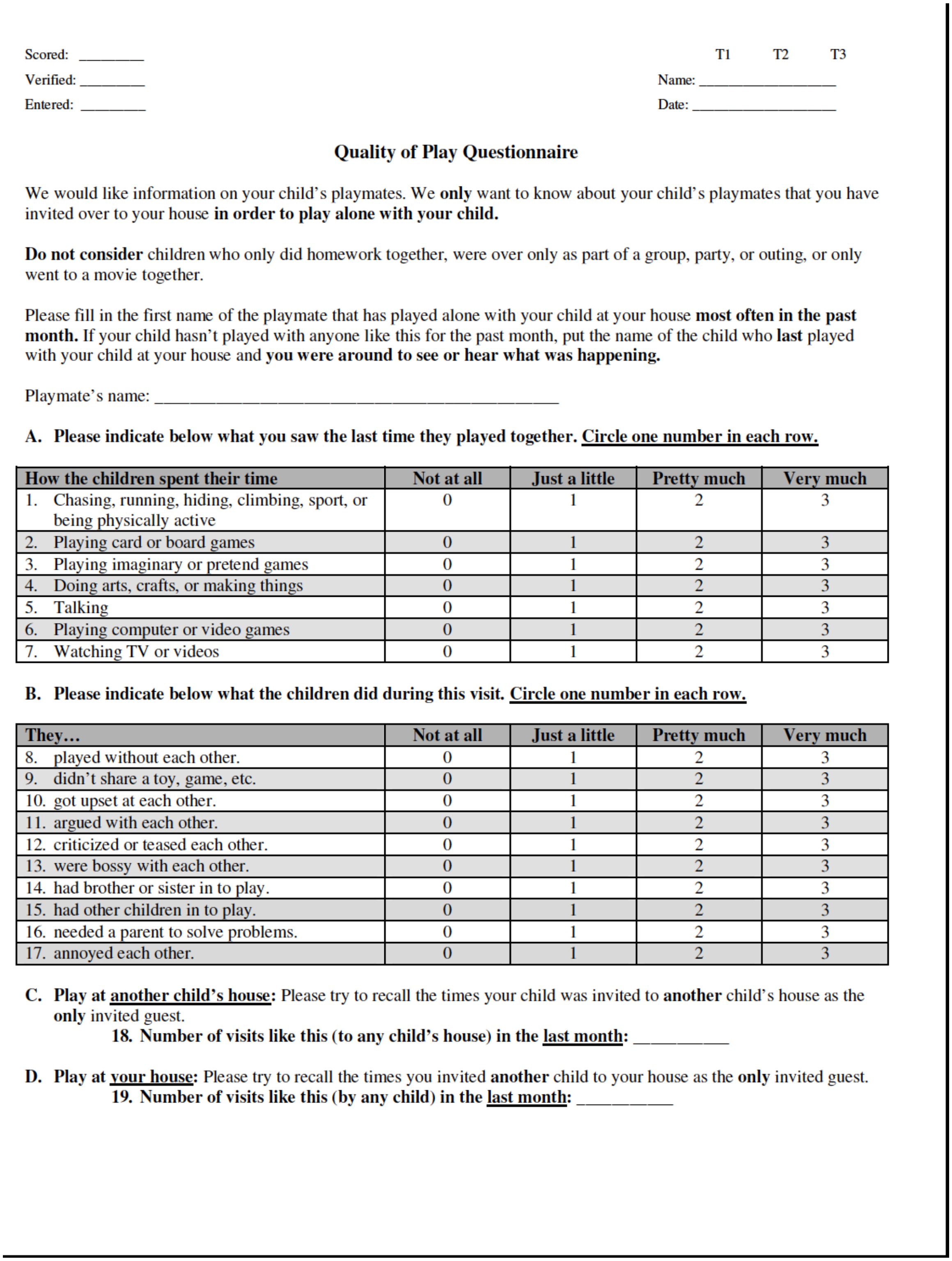
Before starting, be sure to complete the information in the boxes on the right-hand side of page 3.

PEARSON

PsychCorp

Appendix I

The Quality of Play Questionnaire



Scored: _________
Verified: _________
Entered: _________

T1 T2 T3
Name: ___________________
Date: ____________________

Quality of Play Questionnaire

We would like information on your child's playmates. We **only** want to know about your child's playmates that you have invited over to your house **in order to play alone with your child.**

Do not consider children who only did homework together, were over only as part of a group, party, or outing, or only went to a movie together.

Please fill in the first name of the playmate that has played alone with your child at your house **most often in the past month.** If your child hasn't played with anyone like this for the past month, put the name of the child who **last** played with your child at your house and **you were around to see or hear what was happening.**

Playmate's name: ____

A. Please indicate below what you saw the last time they played together. <u>Circle one number in each row.</u>

How the children spent their time	Not at all	Just a little	Pretty much	Very much
1. Chasing, running, hiding, climbing, sport, or being physically active	0	1	2	3
2. Playing card or board games	0	1	2	3
3. Playing imaginary or pretend games	0	1	2	3
4. Doing arts, crafts, or making things	0	1	2	3
5. Talking	0	1	2	3
6. Playing computer or video games	0	1	2	3
7. Watching TV or videos	0	1	2	3

B. Please indicate below what the children did during this visit. <u>Circle one number in each row.</u>

They…	Not at all	Just a little	Pretty much	Very much
8. played without each other.	0	1	2	3
9. didn't share a toy, game, etc.	0	1	2	3
10. got upset at each other.	0	1	2	3
11. argued with each other.	0	1	2	3
12. criticized or teased each other.	0	1	2	3
13. were bossy with each other.	0	1	2	3
14. had brother or sister in to play.	0	1	2	3
15. had other children in to play.	0	1	2	3
16. needed a parent to solve problems.	0	1	2	3
17. annoyed each other.	0	1	2	3

C. Play at <u>another child's house</u>: Please try to recall the times your child was invited to **another** child's house as the **only** invited guest.

18. Number of visits like this (to any child's house) in the <u>last month</u>: ___________

D. Play at <u>your house</u>: Please try to recall the times you invited **another** child to your house as the **only** invited guest.

19. Number of visits like this (by any child) in the <u>last month</u>: ___________

Appendix J

Parental Self-Efficacy in the Management of Asperger Syndrome

How much confidence do you have?

0	1	2	3	4	5
None	Slight	Some	Moderate	Mostly	Completely confident

Behaviour	Occurred in the past month? (Yes/No)	Rate confidence in ability to manage behaviour (0–5)
1 When your child has become agitated or distressed by certain sounds		
2 When your child follows routines rigidly		
3 When your child insists things be done his or her way		
4 When your child becomes distressed by change		
5 When he/she misinterprets the motives of others		
6 When he/she can only see one way to do things		
7 When he/she does not make/maintain eye contact		
8 When your child lacks empathy		
9 When he/she does not take turns in conversation		
10 When he/she finds criticism or losing at a game intensely distressing		
11 When your child interrupts conversations		
12 When he/she talks excessively about a particular topic		
13 When he/she makes stereotypical movements when excited or distressed, e.g. rocking, flapping, facial movements		
14 When he/she engages in routines/rituals, e.g. lining things up		
15 When your child spends an excessive amount of time engaged in a particular interest or activity		

Appendix K

The Maternal Behavioral Rating Scale

Instructions: "Play with these toys provided as you would at home"

Toys Included: xylophone, wooden blocks, stacking rings, nesting blocks, a pull toy, picture books, a toy bus with moveable wooden figures, and a play stove.

RESPONSIVE/CHILD ORIENTED

1. **SENSITIVITY TO CHILD'S INTEREST**.

This item examines the extent to which the parent seems aware of and understands the child's activity or play interests. This item is assessed by the parent's engaging in the child's choice of activity, parent's verbal comments in reference to child's interest and parent's visual monitoring of child's behavior or activity. Parents may be sensitive but not responsive - such as in situations where they describe the child's interests but do not follow or support them.

Rating of [1]: **Highly insensitive**.
Rating of [2]: **Low sensitivity**.
Rating of [3]: **Moderate sensitivity**.
Rating of [4]: **High sensitivity**.
Rating of [5]: **Very high sensitivity**.

2. **RESPONSIVITY**.

This item rates the frequency, consistency and supportiveness of the parent's responses to the child's behaviors. Responses are supportive when they match the child's actions, requests and intentions. Responsivity is assessed in relation to child behaviors that both *demand a response* from adults as well as non-demand behaviors that may not be directed toward the adult. Child behaviors include play and social activity as well as facial expressions, vocalizations, gestures, signs of discomfort, body language, requests and intentions.

Rating of [1]: **Highly unresponsive**.
Rating of [2]: **Unresponsive**.
Rating of [3]: **Consistently responsive**.
Rating of [4]: **Responsive**.
Rating of [5]: **Highly responsive**.

3. **EFFECTIVENESS (RECIPROCITY).**

This item refers to the parent's ability to engage the child in the play interaction. It determines the extent to which the parent is able to gain the child's attention, cooperation and participation in a *reciprocal* exchange characterized by balanced turntaking in play or conversation.

Rating of [1]: **Very ineffective**.
Rating of [2]: **Ineffective**.
Rating of [3]: Moderately effective.
Rating of [4]: Highly effective.
Rating of [5]: Extremely effective.

AFFECT/ANIMATION

1. **ACCEPTANCE**

This item assesses the extent to which the parent's behaviors and communications accept or affirm the child and what the child is doing. Acceptance can range from rejection, to no or few signs of approval, to a more active affirmation as reflected in interactions that indicate that the child's behaviors and communications are legitimate, good or worthy. Acceptance is measured primarily in terms of how parent's nonverbal and verbal behavior accept and affirm the child for who he or she is or what he or she is currently doing rather than for meeting the parent's requests or expectations.

Rating of [1]: **Rejecting.**

Rating of [2]: **Low acceptance**.
Rating of [3]: **Accepting**.
Rating of [4]: **Very accepting**.
Rating of [5]: **High acceptance**.

2. **ENJOYMENT.**

This item assesses the parent's enjoyment of interacting with the child. Enjoyment is experienced and expressed in response to the child himself -- his spontaneous expressions or reactions, or his behavior when interacting with his parent. There is enjoyment in child's being himself rather than the activity the child is pursuing.

Rating of [1]: **Enjoyment is absent**.
Rating of [2]: **Enjoyment is seldom manifested**.
Rating of [3]: **Pervasive enjoyment but low-intensity**.
Rating of [4]: **Enjoyment is the highlight of the interaction**.
Rating of [5]: **High enjoyment**

3. **EXPRESSIVENESS**.

This item measures the tendency of the caregiver to communicate and react emotionally toward the child. It assesses both the frequency of the parent's verbal and nonverbal communications as well as well as the intensity and animation of these communications.

Rating of [1]: **Highly inexpressive**.
Rating of [2]: **Low overt expressiveness**.
Rating of [3]: **Moderate overt expressiveness**.
Rating of [4]: **Overtly expressive**.
Rating of [5]: **Highly expressive**.

4. **INVENTIVENESS.**

This item assesses the range of stimulation parents provide their child; the number of different approaches and types of interactions and the ability to find different things to interest the child, different ways of using toys, combining the toys and inventing games with or without toys. Inventiveness is both directed toward and effective in maintaining the child's involvement in the situation. Inventiveness does not refer merely to a number of different, random behaviors, but rather to a variety of behaviors which are grouped together and directed towards the child.

Rating of [1]: **Very small repertoire**.
Rating of [2]: **Small repertoire**.
Rating of [3]: **Medium repertoire**.
Rating of [4]: **Large repertoire**.
Rating of [5]: **Very large repertoire**

5. **WARMTH.**

This item rates the demonstration of warmth to a child which is positive attitude revealed to the child through pats, lap-holding, caresses, kisses, hugs, tone of voice, and verbal endearments. Both the overt behavior of the parent and the quality of fondness conveyed are included in this rating. It examines positive affective expression; the frequency and quality of expression of positive feelings by the parent and the parent's show of affection.

Rating of [1]: **Very low**.
Rating of [2]: **Low**.
Rating of [3]: **Moderate**.
Rating of [4]: **High**.
Rating of [5]: **Very high.**

ACHIEVEMENT ORIENTATION

1. **ACHIEVEMENT.**

This item is concerned with the parent's encouragement of sensorimotor and cognitive achievement. This item assesses the amount of stimulation by the parent, which is overtly oriented toward promoting the child's developmental progress. This item assesses the extent to which the parent fosters sensorimotor and cognitive development whether through play, instruction, training, or sensory stimulation and includes the energy which the parent exerts in striving to encourage the child's development.

Rating of [1]: Very little encouragement.
Rating of [2]: Little encouragement.
Rating of [3]: Moderate encouragement.
Rating of [4]: Considerable encouragement.
Rating of [5]: Very high encouragement.

2. **PRAISE (VERBAL)**

This scale assesses how much verbal praise is given to the child. Examples of verbal praise are "good boy," "that's a girl," "good job." Praise in the form of smiles, claps or other expressions of approval are not included unless accompanied by a verbal praise. Praise may be given for compliance, achievement or for the child being himself.

Rating of [1]: Very low praise.
Rating of [2]: Low praise.
Rating of [3]: Moderate praise.
Rating of [4]: Praises frequently.
Rating of [5]: Very high praise.

DIRECTIVE

1. **DIRECTIVENESS**

This item measures the frequency and intensity in which the parent requests, commands, hints or attempts in other manners to direct the child's immediate behavior.

Rating of [1]: Very low directive.
Rating of 2: Low directive.
Rating of [3]: Moderately directive.
Rating of [4]: Very directive.
Rating of [5]: Extremely directive.

2. **PACE**

This item examines the parent's rate of behavior. The parent's pace is assessed apart from the child's; it is not rated by assessing the extent to which it matches the child's pace but as it appears separately from the child.

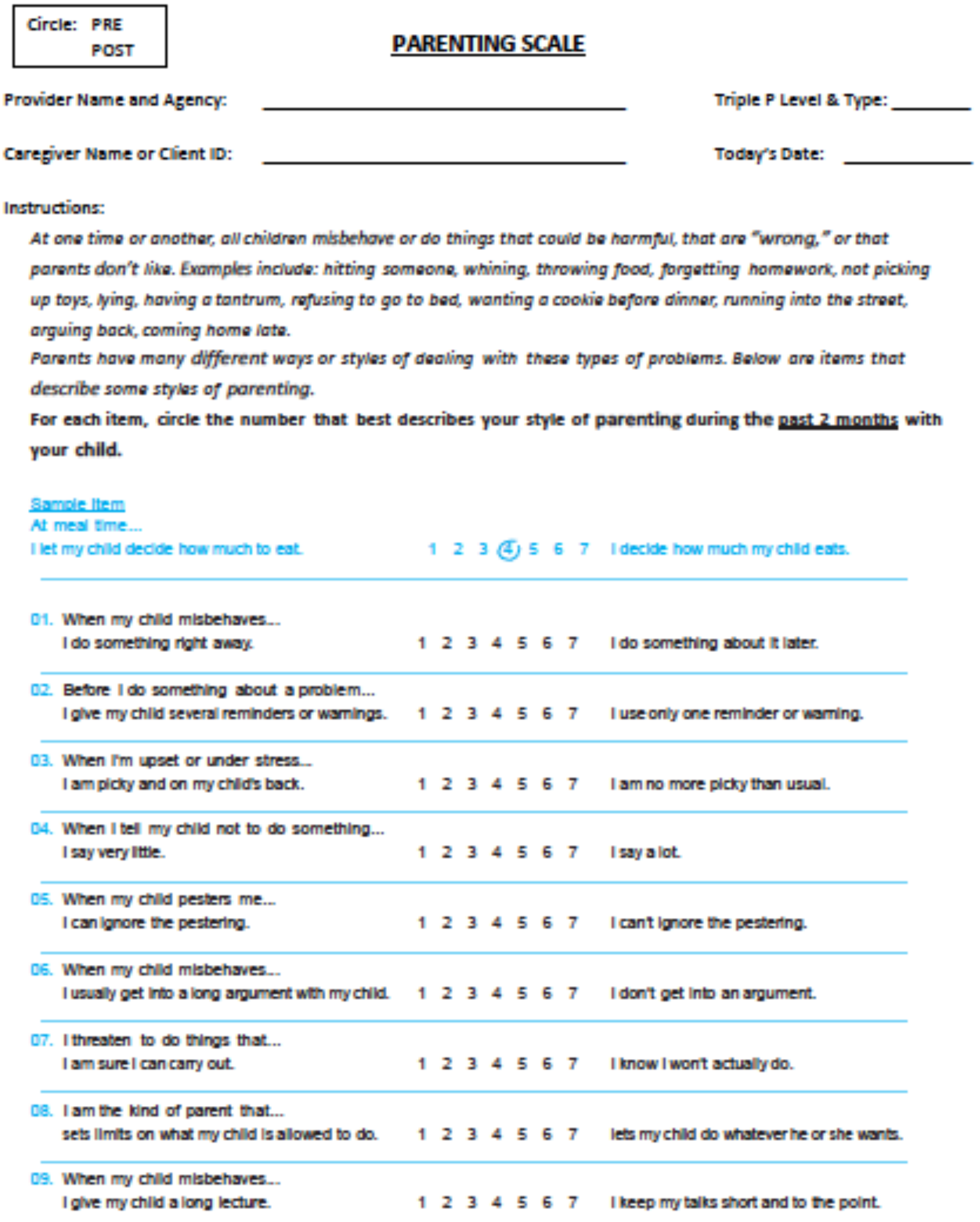
Rating of [1]: Very slow.
Rating of [2]: Slow.
Rating of [3]: Average pace.
Rating of [4]: Fast.
Rating of [5]: Very fast.

MATERNAL BEHAVIOR RATING SCALE (MBRS) - SCORING SHEET

MBRS ITEM	Observation 1	Observation 2	Observation 3	Observation 4
	Date ________	Date ________	Date ________	Date ________
RESPONSIVE/CHILD ORIENTED				
1. Sensitivity				
2. Responsivity				
3. Effectiveness				
Scale Score (Sen + Res + Eff)/3				
AFFECT/ANIMATION				
1. Acceptance				
2. Enjoyment				
3. Expressiveness				
4. Inventiveness				
5. Warmth				
Scale Score (Acc + Enj + Exp + Inv + War)5				
ACHIEVEMENT ORIENTATION				
1. Achievement				
2. Praise				
Scale Score (Ach + Pra)/2				
DIRECTIVE				
1. Directiveness				
2. Pace				
Scale Score (Dir + Pac)/2				
COMMENTS				

Appendix L

Parenting Scale



Circle: PRE
POST

PARENTING SCALE

Provider Name and Agency: ____________________ **Triple P Level & Type:** ________

Caregiver Name or Client ID: ____________________ **Today's Date:** ________

Instructions:

At one time or another, all children misbehave or do things that could be harmful, that are "wrong," or that parents don't like. Examples include: hitting someone, whining, throwing food, forgetting homework, not picking up toys, lying, having a tantrum, refusing to go to bed, wanting a cookie before dinner, running into the street, arguing back, coming home late.

Parents have many different ways or styles of dealing with these types of problems. Below are items that describe some styles of parenting.

For each item, circle the number that best describes your style of parenting during the past 2 months with your child.

Sample Item
At meal time…

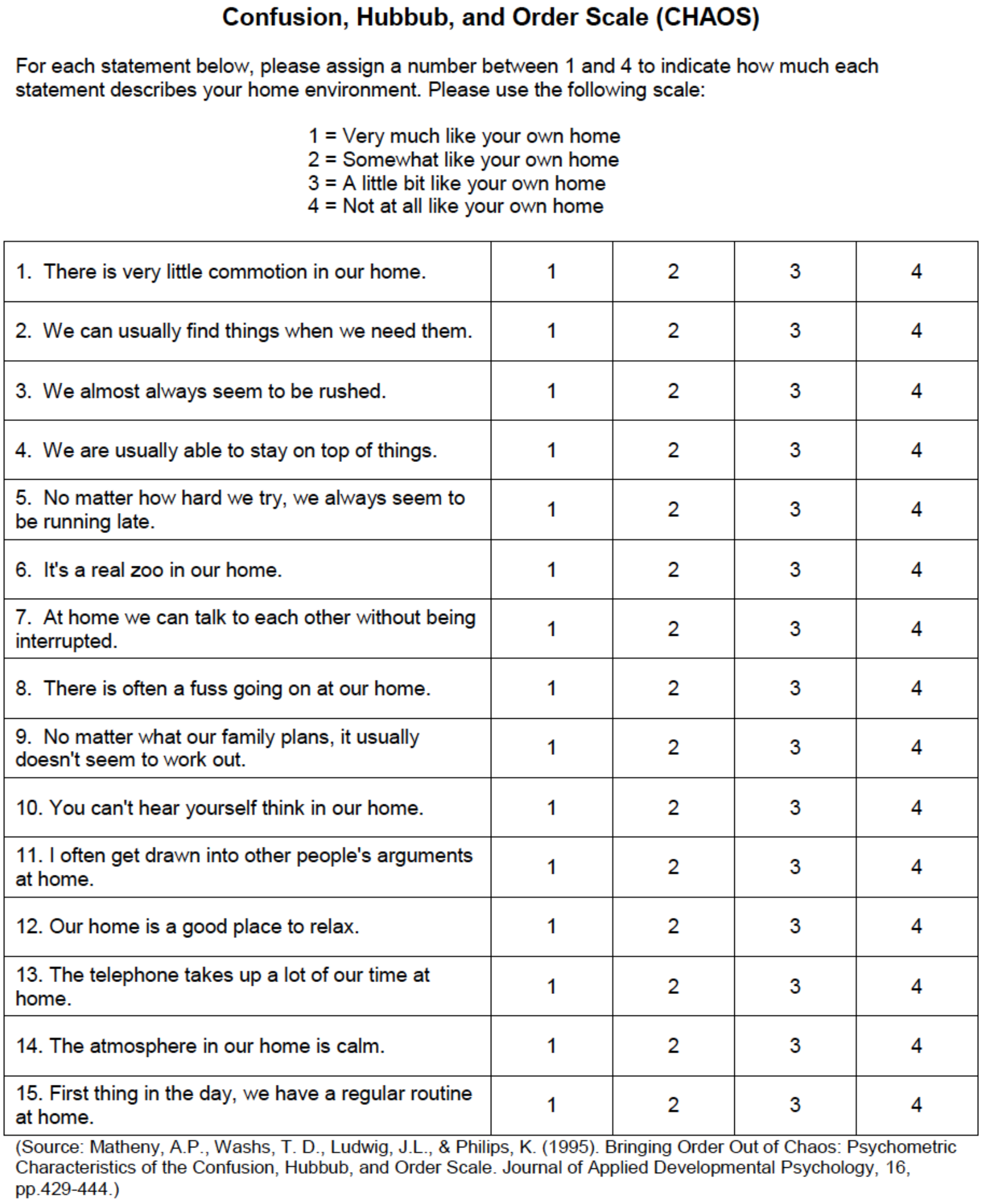
I let my child decide how much to eat.	1 2 3 [✓ 4] 5 6 7	I decide how much my child eats.
01. When my child misbehaves… I do something right away.	1 2 3 4 5 6 7	I do something about it later.
02. Before I do something about a problem… I give my child several reminders or warnings.	1 2 3 4 5 6 7	I use only one reminder or warning.
03. When I'm upset or under stress… I am picky and on my child's back.	1 2 3 4 5 6 7	I am no more picky than usual.
04. When I tell my child not to do something… I say very little.	1 2 3 4 5 6 7	I say a lot.
05. When my child pesters me… I can ignore the pestering.	1 2 3 4 5 6 7	I can't ignore the pestering.
06. When my child misbehaves… I usually get into a long argument with my child.	1 2 3 4 5 6 7	I don't get into an argument.
07. I threaten to do things that… I am sure I can carry out.	1 2 3 4 5 6 7	I know I won't actually do.
08. I am the kind of parent that… sets limits on what my child is allowed to do.	1 2 3 4 5 6 7	lets my child do whatever he or she wants.
09. When my child misbehaves… I give my child a long lecture.	1 2 3 4 5 6 7	I keep my talks short and to the point.

10. When my child misbehaves... I raise my voice or yell.	1 2 3 4 5 6 7	I speak to my child calmly.
11. If saying no doesn't work right away... I take some other kind of action.	1 2 3 4 5 6 7	I keep talking and trying to get through to my child.
12. When I want my child to stop doing something... I firmly tell my child to stop.	1 2 3 4 5 6 7	I coax or beg my child to stop.
13. When my child is out of my sight... I often don't know what my child is doing.	1 2 3 4 5 6 7	I always have a good idea of what my child is doing.
14. After there's been a problem with my child... I often hold a grudge.	1 2 3 4 5 6 7	things get back to normal quickly.
15. When we're not at home... I handle my child the way I do at home.	1 2 3 4 5 6 7	I let my child get away with a lot more.
16. When my child does something I don't like... I do something about it every time it happens.	1 2 3 4 5 6 7	I often let it go.
17. When there's a problem with my child... things build up and I do things I don't mean to do.	1 2 3 4 5 6 7	things don't get out of hand.
18. When my child misbehaves, I spank, slap, grab, or hit my child... never or rarely.	1 2 3 4 5 6 7	most of the time.
19. When my child doesn't do what I ask... I often let it go or end up doing it myself.	1 2 3 4 5 6 7	I take some other action.
20. When I give a fair threat or warning... I often don't carry it out.	1 2 3 4 5 6 7	I always do what I said.
21. If saying "No" doesn't work... I take some other kind of action.	1 2 3 4 5 6 7	I offer my child something nice so he/she will behave.
22. When my child misbehaves... I handle it without getting upset.	1 2 3 4 5 6 7	I get so frustrated or angry that my child can see I'm upset.
23. When my child misbehaves... I make my child tell me why he/she did it.	1 2 3 4 5 6 7	I say "No" or take some other action.
24. If my child misbehaves and then acts sorry... I handle the problem like I usually would.	1 2 3 4 5 6 7	I let it go that time.

25. When my child misbehaves...		
I rarely use bad language or curse.	1 2 3 4 5 6 7	I almost always use bad language.
26. When I say my child can't do something...		
I let my child do it anyway.	1 2 3 4 5 6 7	I stick to what I said.
27. When I have to handle a problem...		
I tell my child I am sorry about it.	1 2 3 4 5 6 7	I don't say I'm sorry.
28. When my child does something I don't like, I insult my child, say mean things, or call my child names...		
never or rarely.	1 2 3 4 5 6 7	most of the time.
29. If my child talks back or complains when I handle a problem...		
I ignore the complaining and stick to what I said	1 2 3 4 5 6 7	I give my child a talk about not complaining.
30. If my child gets upset when I say "No"...		
I back down and give in to my child.	1 2 3 4 5 6 7	I stick to what I said.

Appendix M

Confusion, Hubbub, and Order Scale



Confusion, Hubbub, and Order Scale (CHAOS)

For each statement below, please assign a number between 1 and 4 to indicate how much each statement describes your home environment. Please use the following scale:

1 = Very much like your own home
2 = Somewhat like your own home
3 = A little bit like your own home
4 = Not at all like your own home

1. There is very little commotion in our home.	1	2	3	4
2. We can usually find things when we need them.	1	2	3	4
3. We almost always seem to be rushed.	1	2	3	4
4. We are usually able to stay on top of things.	1	2	3	4
5. No matter how hard we try, we always seem to be running late.	1	2	3	4
6. It's a real zoo in our home.	1	2	3	4
7. At home we can talk to each other without being interrupted.	1	2	3	4
8. There is often a fuss going on at our home.	1	2	3	4
9. No matter what our family plans, it usually doesn't seem to work out.	1	2	3	4
10. You can't hear yourself think in our home.	1	2	3	4
11. I often get drawn into other people's arguments at home.	1	2	3	4
12. Our home is a good place to relax.	1	2	3	4
13. The telephone takes up a lot of our time at home.	1	2	3	4
14. The atmosphere in our home is calm.	1	2	3	4
15. First thing in the day, we have a regular routine at home.	1	2	3	4

(Source: Matheny, A.P., Washs, T. D., Ludwig, J.L., & Philips, K. (1995). Bringing Order Out of Chaos: Psychometric Characteristics of the Confusion, Hubbub, and Order Scale. Journal of Applied Developmental Psychology, 16, pp.429-444.)

Appendix N

Fidelity of Implementation Scoring Sheet (Caregiver Groups)

Checklist for Therapist Adherence to the Treatment (Fidelity of Implementation)-completed by independent coder – Caregiver group

Check if each criterion was completed and rate the degree of competence:
From 1(not well) to 3(well) to 5(very well).

Therapist: ___________________________ Rater initials ______________________

Location: ___________ Session # _____________ Date of session____________________

Today's date______________________

Check if Completed	Rating (1-5)	Treatment Protocol Guideline
		Came to session prepared
		Followed outline for Homework Review
		Followed outline for Parent Didactic Lesson
		Followed outline for Child Didactic Lesson
		Followed outline for parent social coaching lesson
		Followed outline for homework assignments
		Followed outline for parent coached play
		Followed outline for wrap-up
		Was flexible in activities when needed
		Appropriately praised parents

NOTES:

% Completed components (number completed/total # applicable components) ____________

Appendix O

Fidelity of Implementation Scoring Sheet (Child Groups)

Checklist for Therapist Adherence to the Treatment (Fidelity of Implementation)- completed by independent coder – Child Group

Check if each criterion was completed and rate the degree of competence:
From 1(not well) to 3(well) to 5(very well).

Therapist: ___________________________ Rater initials ______________________

Location: ___________ Session # _____________ Date of session____________________

Today's date______________________

Check if Completed	Rating (1-5)	Treatment Protocol Guideline
		Came to session prepared
		Followed outline for Didactic Lesson
		Followed outline for Behavioral Rehearsal #1
		Followed outline for Behavioral Rehearsal #2
		Followed outline for Bathroom Break
		Followed outline for giving out stars
		Followed outline for parent coached play
		Followed outline for wrap-up
		Used the "buzzwords" outlined for this session
		Used rewards to encourage appropriate behavior
		Was flexible in activities when needed
		Appropriately redirected children as needed

NOTES:

% Completed components (number completed/total # applicable components) ____________

Appendix P

Child Assent Form

Title of Project: Caregiver-Assisted Social Skills Intervention for Preschoolers with Autism Spectrum Disorder: Examining Caregiver-Child Relationships and Family Functioning in the PEERS® for Preschoolers Program
Researcher: Angela Scarpa, Ph.D.

I. Explanation of Research to Child

We are going to spend some time talking and playing today, and we will ask you some questions. After today, we might ask you to come back for another meeting after a few weeks where you get to play some fun games and then regular meetings with other children to talk about ways make and keep friends. You can answer our questions and come to our meetings if you want to, but you do not have to. It is your choice. Everything you say here is private, which means we would not talk to anyone else about it unless it is something that can hurt you or someone else.

II. Asking for Child's Verbal Assent

How does this sound to you? Would you like to continue?

III. Witness Affirmation

The child verbally or nonverbally (e.g., head nod) agreed to participate in this research study. The parent will receive a copy of this assent form.

____
Child's name

______________________________ ____________________
Signature of witness Date

Appendix Q

Caregiver Consent Form

Title of Project: Caregiver-Assisted Social Skills Intervention for Preschoolers with Autism Spectrum Disorder: Examining Caregiver-Child Relationships and Family Functioning in the PEERS® for Preschoolers Program

I. The Purpose of this Research/Project

You and your child have been invited to participate in a research study conducted by Angela Scarpa, Ph. D. from the Department of Psychology at Virginia Polytechnic Institute and State University. You have been selected because your son/daughter has a diagnosis of an Autism Spectrum Disorder, is between the ages of 4 to 7 years, and is having difficulty making and keeping friends.

You are free to join this study or not. Your decision to join or not join this study will make no difference in any treatment you or your son/daughter may be receiving. You may get a second opinion to see if it is a good idea to join this study from a person who is not part of this study.

Young children with Autism Spectrum Disorders can have much difficulty socializing and making and keeping friends. The purpose of this study is to test the efficacy of PEERS for Preschoolers in improving the play behaviors and friendships of young children with these difficulties. The intervention is a downward extension of the original PEERS program, which utilizes parent coaching to help youth use newly learned social skills in more natural settings in the development of social relationships with potential friends. Thus, this is a pilot study to work to establish the effectiveness of this study in order to publish the treatment manual and establish this as an evidence-based treatment. It has already been found to be effective in groups run through UCLA and we are conducting groups to see if we can replicate those findings. Additionally, findings may be published in academic publications and/or presented as posters at conferences.

II. Procedures

If you decide to participate in this study, we will ask you to do the following:

You will be mailed a copy of the consent form to review before your first visit. You will then come in with your child for a pre-assessment visit. The pre-assessment session will be conducted at The Virginia Tech Autism Clinic or The Georgia Autism Center and will last approximately 1.5 hours. Upon completion of all pre-assessment measures, eligible families will be invited to join the group. To accomplish the scientific goals of this project, you and your child will be randomly (by chance) assigned to a waitlist period of 1.5, 2, or 2.5-weeks based on the specified location. During this time, you will be asked to complete a number of measures each week. Following the waitlist period, you will then begin the group.

You will be asked to complete some forms for this study. The forms will take approximately 80 minutes to complete. The activities your child will be asked to do will take approximately 80 minutes as well.

<u>Pre-Assessment (1.5 hours)</u>
Parents will be asked to do the following:

1. Complete a Demographic Questionnaire

2. Complete the Vineland Adaptive Behavior Scale – Third Edition to measure the current adaptive functioning of your child and determine study eligibility.
3. Complete the Social Skills Improvement System to assess your child's current social functioning.
4. Complete the Social Responsiveness Scale-2 to assess your child's social functioning.
5. Complete the Parental Self-Efficacy in the Management of Asperger Syndrome
6. Complete the Quality of Play Questionnaire
7. Complete the Confusion, Hubbub, and Order Scale
8. Complete the Social Skills Monitoring form
9. Complete the Parenting Scale

Children will be asked to do the following:

1. Complete the Kaufman Brief Intelligence Test – Second Edition to assess his/her intellectual functioning and determine study eligibility.
2. Complete the Autism Diagnostic Observation Schedule, Second Edition
3. Complete an interaction task with their parent

You will then be contacted via phone or email to find out if you are eligible to participate in the study.

<u>Waitlist Period (1.5, 2, or 2.5 weeks)</u>
If we determine that you are eligible to join this research study, you and your child will be put in a social skills group. You will then be assigned to a baseline period of 1,5, 2, or 2.5 weeks.

Caregivers will be asked to do the following weekly during the waitlist period:

1. Complete the Social Skills Monitoring form
2. Complete the Parenting Scale
3. Complete the Confusion, Hubbub, and Order Scale

<u>Social Skills Groups (8 weeks, 2 1.5 hours sessions per week)</u>
The social skills group is based on the PEERS for Preschoolers curriculum. The group will consist of 4-6 children.

Social Skills groups will:

- Be held at The Virginia Tech Autism Clinic or The Georgia Autism Center twice per week for 8 weeks (i.e., 16 sessions).
- Include homework assignments (e.g., finding a play group, setting up a play date, working on specific skills discussed in the group) to be completed at home each week
- Include separate parent sessions that are held at the same time as the child meetings
- Each session will conclude with a joint parent coaching session in which you are able to interact with your child and receive feedback from a clinician
- Teach you about helping your child make and keep friends.
- Be videotaped to be used only for research, supervision, and instructional purposes in order to train other professionals how to run groups like these

Topics will include:

- Asking for and using friends' names
- Greeting friends
- Sharing and giving turns to friends
- Keeping cool when upset during play
- Asking for help and helping friends

- Maintaining body boundaries
- How to make and keep friends

<u>Exit (10 minutes in person, about 1 hour completing paperwork)</u>
In order to see how much your child learned from these social skills groups, we will test you and your child after the 16 sessions are completed. The paperwork is the same as the pre-assessment visit and the only in-person requirement is the interaction task. As such, the following will occur:

Parents will be asked to do the following:
1. Complete the Social Skills Improvement System to assess your child's current social functioning.
2. Complete the Social Responsiveness Scale-2 to assess your child's social functioning.
3. Complete the Parental Self-Efficacy in the Management of Asperger Syndrome
4. Complete the Quality of Play Questionnaire
5. Complete the Confusion, Hubbub, and Order Scale
6. Complete the Social Skills Monitoring form
7. Complete the Parenting Scale

Children will be asked to do the following:
1. Complete an interaction task with their parent

<u>Follow-Up (4-6 weeks after completing group, 10 minutes in person, about 1 hour completing paperwork)</u>
Another assessment will be conducted with you and your child 4-6 weeks after the group is completed. The paperwork is the same as the pre-assessment visit and the only in-person requirement is the interaction task. As such, the following will occur:

Parents will be asked to do the following:
1. Complete the Social Skills Improvement System to assess your child's current social functioning.
2. Complete the Social Responsiveness Scale-2 to assess your child's social functioning.
3. Complete the Parental Self-Efficacy in the Management of Asperger Syndrome
4. Complete the Quality of Play Questionnaire
5. Complete the Confusion, Hubbub, and Order Scale
6. Complete the Social Skills Monitoring form
7. Complete the Parenting Scale

Children will be asked to do the following:
1. Complete an interaction task with their parent

III. Potential Risks
There are no more than minimal risks involved for you and your child to participate in this study. Some of the potential risk includes:

You and your child may feel uneasy at first when starting the social skills groups. To help with this, study staff will be present to try to make every child and parent feel comfortable and accepted.

Some parents or children might become upset by some of the questions that we ask. If there is a question that makes you or your child feel uncomfortable, you and your child do not have to answer questions that you do not want to.

If you choose not to be in this study or it is determined that you or your child do not qualify to participate in the study, you may still enroll in a PEERS social skills group in the future and you will be provided with referrals for alternative social skills programs in the community.

POTENTIAL BENEFITS TO SUBJECTS AND/OR SOCIETY
When you join this study, you will be provided training on how to help your child make and keep friends, although we cannot guarantee that you or your child will benefit. The possible benefits to society are that the knowledge gained may help us create better social skills groups to help young children.

The study may ultimately contribute to the scientific literature on autism and to the autism community. Specifically, it may further our knowledge about evidence-based psychosocial treatment for emotion regulation skills and how interventions targeting understanding of emotions and feelings affect behaviors in children with Autism Spectrum Disorders.

IV. Extent of Anonymity and Confidentiality
You and your child will be assigned a number and only this number will be used on your data documents. A master list linking your number with a name will be kept in a locked cabinet in a locked office at the Virginia Tech Autism Clinic. Any information obtained during this research that can be identified with you will remain confidential and will be disclosed only with your permission or as required by law. Situations where confidentiality must be broken include 1) if a previously unreported incident of child abuse is known or strongly suspected or 2) if a participant is believed to be a threat to him/herself or others. In these cases, the investigator must notify appropriate authorities, and you will be informed of the need to report. The authorities would be provided the information about the possibility of harm to the child or others that was obtained during the research.

Your or your child's information that has a name or code on it will be kept in locked cabinets. Only the designated research team will have access to this information; however, as a client at the Virginia Tech Autism Clinic, all records will be kept as part of your child's official clinical records. Videotapes will be kept in a locked cabinet until they are viewed. All videotapes will be maintained indefinitely for training purposes. Segments of videotapes may be shown in future trainings, in which your child's image and first name may be shown. No identifiable data will be taken from the Virginia Tech Autism Clinic. At no time will information obtained from this study be released to anyone without your written consent, except under the conditions noted above. Results may be published or presented for scientific purposes, but **your or your child's identity will not be revealed** in any description or publication of research findings.

V. Compensation
You will not receive compensation for participation in this study.

VI. Costs
The treatment will be provided through The Virginia Tech Autism Clinic or The Georgia Autism Center, but since this is a research study, no fee will be charged. Thus, families will not incur any costs for participation in the study.

VII. Freedom to Withdraw
You can choose to participate and be part of this study or not. If you volunteer to be in this study, you are free to withdraw yourself and your child from this study at any time without penalty or consequences of any kind. Parents and children have the right to refuse to answer any questions or respond to any part of this study, and continue in the study without any penalties. There may be times that the investigator determines that you or your child cannot continue in the study. In these cases, you will be notified and the session will end. You may still continue to receive and complete the treatment even if you decide to withdraw from the study.

VIII. Approval of Research

This project has been approved, as required, by the Institutional Review Board for Research Involving Human Subjects and the Department of Psychology at Virginia Polytechnic Institute and State University.

IX. Parent's Responsibilities

I give my consent for myself and permission for my child to participate in this study. I have the following responsibilities: 1) My child and I (or a designated caregiver) will complete an initial screening involving observation, interview, and questionnaires. 2) My child and I (or a designated caregiver) will attend at least 14 weekly one-hour group therapy sessions. 3) My child and I (or a designated caregiver) will complete additional questionnaires at pre-treatment, immediately post-treatment (within one week) and 16 weeks after treatment ends for follow-up. I agree to allow the initial screening, treatment sessions, and assessment sessions to be videotaped, as described above. I will provide transportation to and from therapy sessions. I understand my child is receiving treatment through The Virginia Tech Autism Clinic or The Georgia Autism Center, and I agree to the clinic's policies.

X. Permission

I have read the preceding Consent and Permission Form and conditions of this project, or it has been read to me, and I understand its contents. Any questions I have about the study have been answered. If my child and I participate, I understand that we may withdraw at any time without penalty. I agree to abide by the rules of this project.

I give my voluntary consent to participate in this project and give permission for my child's participation. A signed copy of this consent/permission form will be given to me.

XI. Identification of Investigators

If you have any questions or concerns about this research, please feel free to contact the Principal Investigator, Angela Scarpa, Ph.D. at 540-231-8747, Virginia Tech Center for Autism Research. Dr. Scarpa can also be reached by email at ascarpa@vt.edu.

XII. Right of Research Subjects

You can choose to withdraw your consent at any time and discontinue participation without penalty. If you have questions regarding your rights as a research subject, you can contact Dr. David M. Moore, Chair of the Institutional Review Board, Research Division, at (540) 231-4991. If you have any additional questions please contact Dr. D.W. Harrison from the Psychology Human Subjects Committee at (540) 231-4422.

Please indicate whether you _____ give permission or ____ do not give permission for your child's participation in the project. (Please check one.)

SIGNATURE OF RESEARCH SUBJECT OR LEGAL REPRESENTATIVE

____
Name of Child (Printed)

____
Parent/Guardian's Name (Printed)

____________________________________ ______________
Parent's/Guardian's Signature Date