A Coaching Intervention for Teaching Caregivers Different Ways of Playing with Their Children with Disabilities

Huan-Ching Chang

A dissertation

submitted in partial fulfillment of the

requirements for the degree of

Doctor of Philosophy

University of Washington

2021

Reading Committee:

Kathleen Artman-Meeker, Chair

Amy Pace

Angel Fettig

Nancy Rosenberg

Program Authorized to Offer Degree:

College of Education

University of Washington

Abstract

A Coaching Intervention for Teaching Caregivers
Different Ways of Playing with Their Children with Disabilities

Huan-Ching Chang

Chair of the Supervisory Committee:
Kathleen Artman-Meeker
College of Education

Children with disabilities often engage in less complex play and fewer spontaneous pretend play behaviors. Research has highlighted the value of providing caregivers with sustained support to promote their active involvement in the learning of their children with disabilities. Caregivers; however, are rarely offered opportunities to facilitate play skills. In addition, as remote caregiver coaching is emerging, it is important to further explore its effectiveness. In this single-case design study, the effects of a multi-component coaching package on coaching caregivers in implementing an intensive, multi-step teaching procedure with fidelity, to engage in pretend play with their children was examined. Findings indicated that the coaching package was associated with an increase in caregivers' use of the teaching procedure with fidelity. Caregivers found the coaching package to be beneficial and express strong interest in using the strategies with their children. This study sheds light on ways to support caregivers of children with disabilities around play, that are accessible and easy to use.

Acknowledgement

This journey has not been easy at times, but I have been extremely fortunate to have the support of a group of amazing people to lift me up. I am forever grateful for my advisor, Dr. Kathleen Meeker, for her unwavering mentorship, dedication, support, and encouragement. Words cannot describe how appreciative I am. My committee, Dr. Angel Fettig, Dr. Nancy Rosenberg, and Dr. Amy Pace, thank you so much for your mentorship, guidance, encouragement and trust in me. I could not have asked for more. Mischa McManus, Mohammed Alasmari, and Nawinda Upanan, it would have been impossible if it were not for your support and help with my coding. My deepest thank you to my buddies for your forever cheer leading.

To my dearest parents and little brother, it would have been impossible to embark on this journey and pursue my dream without your love and support.

To Aaron, for your understanding, patience and love that gives me the courage to continue this journey. I am lucky to have you by myside.

To the families in my study, you are wonderful. I feel very lucky to get to know you and your children.

Thank you from the bottom of my heart.

TABLE OF CONTENTS

Chapter One: Introduction

Play in Early Childhood

Play, in early childhood settings, is regarded as a major developmental milestone for young children (Ginsburg, 2007). Play provides opportunities for young children to engage in meaningful learning activities and develop positive social interactions with others in natural settings (Barton, 2014; Lifter et al., 2011). The National Association for the Education of Young Children recently released a new Position Statement on Developmentally Appropriate Practice (DAP) (NAEYC, 2020). Developmentally appropriate practice is defined as "methods that promote each child's optimal development and learning through a strengths-based and play-based approach to joyful and engaged learning" (NAEYC, 2020, p.5). The Position Statement emphasizes that all domains of child development are important and should be intentionally and thoughtfully nurtured through play. In other words, it asserts that play is an essential teaching practice that promotes cognitive, language, physical, social-emotional skills, as well as content knowledge across developmental areas. Substantial research has indicated the important benefits of play for children with and without disabilities (Lifter et al., 2011). In fact, years of research have shown that play skills are also important in facilitating the development of young children's cognitive, language and social-emotional behaviors (Lory et al., 2018; Jung & Sainato, 2013). In addition, being able to engage independently in meaningful play helps promote a stable home environment in which adults can attend more fully to the range of child and adult needs in the home. Therefore, it is essential for early childhood professionals to ensure that all children have ample opportunities and effective supports to engage in joyful play activities that further foster their development and learning.

Pretend Play and Children with Disabilities

Young children engage in multiple forms of play, including solitary, parallel, associative, cooperative, functional, and pretend play. Play allows children to explore their environment, employ senses and motor actions, develop relationships with others (i.e., peers, siblings, caregivers). This provides opportunities to learn new skills across several developmental domains in a variety of settings (McConnell, 2002). Children with disabilities; however, engage in less complex play and fewer spontaneous pretend play behaviors (Barton, 2015; Campbell et al., 2016; Davis et al., 2018; Jarrold, 2003; Kasari et al., 2013). As highlighted in Lifter et al. (2011), play can serve as a context for embedding evidence-based practices to teach developmentally appropriate goals and learning objectives to young children. Play also affords a natural context in which children with disabilities learn and engage in social interactions with their peers (Davis et el., 2018; Strain et al. 2008). Therefore, delays in generating more spontaneous and complex pretend play behaviors are likely to hinder young children's developmental milestones, learning opportunities, and social interactions with their peers (Barton, 2015; Wolfberg et al., 2012). Considering the fact that pretend play is one of the most common forms of play in preschool classrooms and that pretend play skills are oftentimes regarded as significant Individualized Education Program goals for young children with disabilities (Barton & Wolery, 2008), the present study intends to focus on investigating pretend play interventions that could increase the play repertoire of young children with disabilities.

Peer-Play, Sibling-Play and Its Value

Since 1991, an increased focus on the inclusion of preschool children with disabilities in early childhood education settings has resulted in a call for changes in educational policies, systems and practices (Odom et al., 2004). Teaching children how to play with toys or objects

and engage in more complex play (i.e., pretend play) is one way to ensure effective learning, promote engagement and facilitate peer interactions in early childhood settings, which in turn is likely to result in positive child outcomes. The U.S. Department of Health and Human Services and Education (2015) stated that children with disabilities should be provided with opportunities to engage with their peers, both with and without disabilities. National organizations such as the NAEYC and the Division for Early Childhood (DEC) have also developed a joint position statement on inclusion. Specifically, the joint statement discusses the meaning of inclusion in early childhood settings and describes ways in which researchers and educators can use recommended practices to promote development and belonging for every child. Inclusion does not happen on its own; rather it is the collective actions and relentless efforts of policy makers, researchers, practitioners, families and children (Barton & Smith, 2015).

Odom et al. (2004) used Bronfenbrenner's (1976; 1979) Ecological Systems of Development to guide their review on synthesizing the knowledge about preschool inclusion in preschool literature in the U.S. The Ecological Systems of Development asserts that child's development occurs within a series of nested systems and each is embedded within larger systems. The five levels of systems as described by Odom et al. are: the child, the microsystem (i.e., inclusive classrooms in which children with disabilities participate), the mesosystem (i.e., family, transition and community), the exosystem (i.e., social policy and administrative issues), the macrosystem (i.e., culture and diversity). On the microsystem level, Odom and colleagues examined various factors. The factors include: the quality of classroom environments, environmental arrangements, instructional practices, children's relationships with peers, interventions to promote social-emotional development and the effects of inclusion on children's

perceptions of children with disabilities, and these factors are associate with fostering an inclusive early learning environment.

Specifically, on the instructional practice factor, they expressed that despite wide consensus on the necessity of creating a high-quality early learning environment, placement alone might not be sufficient for children with disabilities to actively participate in classroom activities as well as engage in social interactions. To address this issue, several instructional strategies are recommended to be used to better promote the learning of young children in inclusive preschool classrooms. One of the instructional techniques identified by the research team is peer-mediated interventions (PMI). In PMI, peers are taught to implement interventions for children with disabilities in inclusive classrooms. PMI has been identified as an evidence-based practice that can successfully increase the skills of children with disabilities in multiple areas, such as social skills, language and communication skills, and functional skills (Ganz and Flores, 2008; Kamps et al., 2015; Thrembath et al., 2009).

Peer Involvement in Interventions for Children with Disabilities

In preschool classrooms, children's pretend play can be observed while playing alone (i.e., solitary play) or with peers (i.e., social pretend play). PMI research with a focus on pretend play interventions demonstrates that training peers on implementing play-related interventions are related to increased pretend play behaviors in young children with disabilities (Goldstein & CIsar, 1992; McDonald et al., 2009; Zercher et al., 2001). Involving peers can be especially beneficial when teaching pretend play to children with disabilities in inclusive classrooms. In the context of pretend play, PMIs not only create opportunities for both children with and without disabilities to engage in more positive social and play behaviors, but also helps to produce richer and more natural child-child interactions during play activities (Locke et al., 2012).

Sibling Involvement in Interventions for Children with Disabilities

While a large body of literature has provided strong support for PMIs where peers are taught to perform desired target skills or behaviors, it is also important to consider the role that siblings play in supporting the learning of children with disabilities in home settings (Shiver & Plavnick, 2014; Sperry et al., 2010). Children play unique roles in the lives of their siblings with disabilities (MaHale et al., 2016; Spector & Charlop, 2018). Siblings impact one another directly (e.g., playmates that provide opportunities for developing social skills) and indirectly (e.g., family resource dilution) from early childhood on (McHale et al., 2016). Relationships among siblings have unique implications for the learning and development of children with disabilities. First, sibling relationships are usually the earliest and longest lasting relationships that individuals have. This provides a valuable source of support throughout their lives (Diener et al., 2014; Glugatch & Machalicek, 2021; McHale et al., 2016). Although the amount of time siblings spend with each other naturally decrease as they grow older, their relationships continue to have lifelong influence on adult well-being, and serves as an additional source of social-emotional support (Glugatch & Machalicek, 2021; McHale et al., 2016; Waldinger et al., 2007). Researchers have explored the mechanisms underlying sibling influences through theoretical perspectives to better understand the complex nature of sibling relationships (Feinberg et al., 2012; McHale et al., 2016). For example, McHale et al. (2016) proposed that sibling influences are grounded in social learning theories, where siblings affect one another's development through deviance training and observational training.

Furthermore, siblings usually interact daily, which provides sustained and natural opportunities for practicing social and play skills with a familiar partner (Shivers & Plavnick, 2015; Spector & Charlop, 2018). El-Ghoroury and Romanczyk (1999) also highlighted that

children with Autism Spectrum Disorder (ASD) may be more likely to engage in social interactions with their siblings relative to their caregivers and peers. Watkins et al. (2021) also reached a similar conclusion in their study and suggested that sibling relationships seem to be an important contributor to overall development and socialization for young children with disabilities. Recognizing the critical role that siblings play and the potential benefits of involving siblings in interventions, an increasing amount of research has explored the potential of training siblings as intervention agents or models to teach targeted skills. For example, Walton and Ingersoll (2012) trained six siblings to use a complex imitation intervention package (i.e., linguistic mapping, modeling, prompting and praise) to teach reciprocal imitation to young children with ASD. Results of the study showed that children with ASD increased their overall imitation skills as well as their joint engagement. Researchers have also successfully trained siblings to use evidence-based practices to improve the social and communication skills of young children with disabilities (e.g., Donaldson, 2015; Oppenheim-Leaf et al., 2012; Tsao & Odom, 2006). In addition to sibling research focusing on social skills and imitation skills, siblings were also involved in a few play interventions for children with ASD (Akers et al., 2018; Celiberi &Harris, 1993; Coe et al., 1991; Glugatch & Machalicek; 2021).

However, sibling-mediated interventions have received far less attention (Donaldson, 2015; Ferraioli et al., 2012). As a result, there is a need for further research involving siblings in interventions for children with disabilities. Anecdotally, Baker (2000) also suggested that participation in sibling-mediated interventions could benefit both siblings and children with disabilities. Baker also indicated that caregivers reported that siblings spend more time with their siblings with disabilities after participating in sibling-mediated interventions. Despite the positive outcomes of participating in sibling-mediated interventions for both siblings and

children with disabilities, Shiver and Plavnick (2015) noticed that sibling-mediated interventions usually require extensive sibling training, which may create stress and burden for siblings. While promoting positive child outcomes is the goal for intervention studies for children with disabilities, it is equally important to take sibling well-being and overall development into account.

Coaching Caregivers to Facilitate Child Learning and Development

A growing body of literature has shown that caregiver-implemented interventions can be effective in supporting the development of children with disabilities and promoting positive child outcomes in multiple developmental areas (Brown & Woods, 2015; Fettig et al., 2015; Gerow et al., 2018; Kemp & Turnbull, 2014; Ingersoll & Gergans, 2007; Windsor et al., 2019). This suggests the critical need for continuously providing caregivers with sustained support to promote their active involvement in the learning of their children with disabilities.

The COVID-19 pandemic has brought many changes to our lives, one of which pertains to early childhood education. That is, when COVID-19 pandemic first appeared, a majority of young children received early childhood education remotely. This was a brand-new experience for both children and their families and was particularly challenging for young children with disabilities and their families. This shift in the delivery of special education service required caregivers to be more involved in their children's learning throughout the day. As a result, it has been particularly important for caregivers to take up roles as "interventionists" to implement their children's IEP goals and ensure that their learning goals are met. In fact, young children with disabilities (especially children with ASD) oftentimes have play-related IEP goals. In a home-based learning environment, play may be a particularly important learning context and provides opportunities for caregiver-child and sibling interactions. Considering the value of play

and the importance of consistent and frequent implementation of play-related IEP goals, it is worthwhile for caregivers to learn to use evidence-based practices to teach play to their children with disabilities. Despite the many ways that caregivers provide support and implement interventions for their children with disabilities, to date, only a few studies have focused on coaching caregivers in using evidence-based practices to increase the play skills of young children with disabilities in home settings.

Purpose of Present Study

The purpose of the present study was to examine the effects of a multi-component coaching package on teaching caregivers to use a modeling procedure with fidelity to promote the pretend play skills of their children with and without disabilities. This study was conducted completely during the COVID-19 pandemic. To be more specific, caregivers received virtual trainings on using a teaching procedure to model multiple types of pretend play for their children. Following trainings, caregivers also received performance feedback via email as a coaching strategy to improve their use of the modeling procedure. In addition, the study sought to understand the influence of involving siblings in the play intervention. Lastly, the study explored caregivers' perceptions of the coaching package as well as their experiences and thoughts on participating in the study.

Research Questions

This study examines the following questions:

- RQ 1: When a multi-component coaching package for teaching different types of pretend play is used, does caregivers' implementation fidelity of the modeling procedure increase?

- RQ 2: Do caregivers maintain their use of the modeling procedure with fidelity to teach pretend play over time?
- RQ 3: Would the play intervention improve social interactions and pretend play behaviors for both the child with ASD and the sibling?
- RQ 4: Do caregivers perceive the coaching as acceptable and effective?

Significance of Present Study

Current caregiver coaching research for children with disabilities has mainly focused on communication and language skills (e.g., Brown & Woods, 2015; Gerow et al., 2018; Kaiser & Roberts, 2013; Meadan et al., 2016), imitation skills (e.g., Ingersoll & Gergans, 2007), or positive behavior support strategies (e.g., Fettig et al., 2015). Despite the critical contribution that pretend play has to the development of young children and the necessity for using effective instruction to teach pretend play to children with disabilities, in most of the existing literature, coaching around pretend play has only been provided to early childhood educators. In addition, to my knowledge, there are only a few studies that have examined the effects of involving siblings in play-related interventions for children with disabilities (Akers et al., 2018; Celiberi &Harris, 1993; Coe et al., 1991; Glugatch & Machalicek; 2021). Considering the amount of time that children with disabilities spend with their siblings and the potential source of influence siblings may have on children with disabilities, it is imperative to involve siblings in pretend play interventions for children with disabilities, especially when designing home-based interventions. By addressing the gaps in research as mentioned above, the overarching goal of this study was to increase the play repertoire of young children with disabilities in home settings by coaching caregivers in the use of effective instructional strategies with fidelity. This study also

intentionally included the siblings of children with disabilities to explore changes it may bring to sibling relationships.

Chapter Two: Literature Review

This chapter provides an overview of pretend play and what is known about pretend play development in children with and without disabilities. First, I present literature on pretend play interventions and different methods for teaching pretend play in inclusive natural settings. Then, I explore research on coaching in early childhood settings, with an emphasis on pretend play. Almost all of the existing literature focuses on training teaches to facilitate play skills. I intend to draw implications and insights from existing literature to develop caregiver coaching models on pretend play. Lastly, I discuss the benefits and implications of caregiver-implemented interventions as well as implications for coaching caregivers around teaching pretend play to their children with disabilities.

Importance of the Development of Pretend Play in Young Children

Pretend play is a unique form of play that is characterized by its nonliteral feature (Barton, 2010; Weisberg, 2015). Some examples of pretend play include, child feeds the baby doll with a bottle, child uses a block as ice cream to feed the baby, or child feeds the baby some imaginary cake. Years of research has shown that pretend play is associated with young children's cognitive development, language and social skills (Charman et al., 2003; Goldstein & Lerner, 2018; Kasari et al., 2013; Li et al., 2016; Lifter et al., 2011; Weisberg, 2015). For example, Li et al. (2016) found that children's pretend play with advanced cognitive processing and social interactions, is more likely to be associated with higher levels of social skills. In a randomized control study conducted by Goldstein and Lerner (2018), children who received a drama/pretend-based intervention showed improvements in their language, literacy and

emotional regulations skills. In addition, Weisberg (2015) argued that early pretend play skills may predict later cognitive and social achievements, such as symbolic understanding, theory of mind and counterfactual reasoning skills. Weisberg further explained that pretend play is likely to strengthen children's language skills as it provides opportunities for children to learn to navigate symbolic relationships. Because of children's varied abilities and inclinations in engaging in pretend play, investigating whether a child's level of pretend play is associated with later developmental outcomes is important in designing early learning curricula as well as learning environments.

The relations between pretend play and children's developmental outcomes can be explained from different theoretical perspectives. Two important developmental psychologist, Piaget and Vygotsky, provided possible explanations for the impact of pretend play on children's development. Piaget (1962) claimed that pretend play can be viewed as an "epiphenomenon", in which pretend play helps the development of some domains, but other skills are actually the primary cause of children's development (Lillard et al., 2013). In contrast, Vygotsky (1978) argued that pretend play has a more direct role in children's development, in that it requires children to think in more abstract terms (Kasari et al., 2013; Lillard et al., 2013). That is, through pretend play, children learn to understand the concept that objects can be separated from reality. This feature of pretend play then helps children reach the upper end of their "zone of proximal development" (Lillard et al., 2013). Vygotsky (1978) also emphasized that pretend play assists children in understanding the social world around them by using symbols in imaginary contexts (Thompson & Goldstein, 2019). This argument supports Weisberg's (2015) statement that pretend play can serve as an effective teaching strategy because children are able to learn true facts from pretense scenarios. Despite the different causal relationship conclusions between

pretend play and young children's development made by Vygotsky and Piaget, pretend play is recognized as a strong predictor for children's social and language skills, especially for children with disabilities (Charman et al., 2003; Lifter et al., 2011; Sigman et al., 1999).

A large body of research has underscored the importance of pretend play in children's early learning. However, inconsistencies in the definitions of pretend play have seriously limited interpretation and analysis of pretend play research (Barton, 2010; Thompson & Goldstein, 2019; Weisberg, 2015). This issue pertains to the validity of measures on pretend play casts doubt on the casual correlations drawn between pretend play and child development. To address this issue, several researchers set out to develop more comprehensive measurement systems with clear operational definitions for different types of pretend play. For example, Barton (2010) developed a pretend play taxonomy, which included four types of pretend play. These four types of pretend play include: (a) functional play with pretense (def. as *"nonliteral use of actual or miniature objects in the manner in which they were intended without reality-based outcome "*), (b) object substitution (def. as *"use an object as if it was a different object"*), (c) assigning absent attributes (def. as "*assigning dramatic roles of emotions to self, others or inanimate objects*") and (d) imagining absent objects (def. as *"performing an action as if an object was present in the object's absence"*). Vocalization and sequences are also identified as the two common characteristics of pretend play. An example of a pretend play sequence is when a child stirs a spoon in a toy pan and then puts it up to the doll's mouth. Also, a child can use vocalizations to describe the actions (e.g., "I'm feeding the baby"). The play taxonomy (Barton, 2010); however, didn't specify whether a hierarchy exists among pretend play behaviors, suggesting one type of pretend play is built on another.

On the contrary, Thompson and Goldstein (2019), developed a model of pretend play

with hierarchy. After reviewing nearly 200 empirical articles, they proposed that pretend play is likely to progress from least to most complex in the following order: object substitution (def. as *" using an object as if it is something different than what its properties suggest "*), attribution of properties (def. as *"giving an inanimate object properties it does not already have such as giving an object human characteristics"*), social interactions within pretend play (def. as *"engaging with peers, while also engaged in some form of pretend play"*), role play and pretense-related metacommunication (def. as *"discussions about the rules of the pretend play, negotiation of rules"*) (Thompson & Goldstein, 2019, Table 1). This assumption corresponds to Weisberg's (2015) statement that the earliest form of pretend play is probably object substitution, where children use objects as if they were something else (e.g., using a block as a car). And that, over time, young children develop more complex forms of pretend play such as imagining absent objects (e.g., bringing hands to lips as if eating), assigning absent attributes (e.g., saying the doll is happy), and social pretend play (e.g., role-play with peers) (Barton, 2010, 2014; Weisberg, 2015). It is important to note, however, that measurement issues around pretend play might have hindered the interpretability and validity of findings across reviews. In addition, in Thompson and Goldstein (2019), the studies reviewed did not include children with ASD. As a result, the pretend play hierarchy model should be interpreted and used with caution, as the play developmental trajectories of children with ASD were not reviewed. It is worthwhile to further investigate measurement systems used in current pretend play, with an extra focus on pretend play of children with disabilities. This will help future studies in developing pretend play interventions, with the ultimate goal of increasing children's play repertoire.

Pretend Play in Young Children with Disabilities

Children begin engaging in pretend play behaviors when they are about 18 months old

(Brown & Murray, 2001; Weisberg, 2015). Children with disabilities, however, often demonstrate less complicated play behaviors and engage in less spontaneous pretend play (Barton & Wolery, 2008; Campbell et al., 2016; Davis et al., 2018; Jarrold, 2003; Kasari et al., 2013). For instance, Campbell et al. (2016) found that toddlers with ASD engaged in less pretend play behaviors during an unstructured play session with their parent than neurotypical toddlers. Additionally, Hobson and colleagues (2008) stated that, in general, children with ASD showed a lack of playfulness in pretend play as well as engaging in less creative symbolic play. These differences in pretend play are likely to affect children with disabilities in multiple ways, including developmental milestones, learning opportunities, as well as opportunities to build positive social interactions with their peers (Barton, 2015, 2016). Pretend play not only affords children with disabilities opportunities to engage in social interactions with peers in natural settings, it also promotes their active engagement in classroom activities (Barton & Wolery, 2008; Brown & Murray, 2008). Substantial research has shown that children with disabilities can learn and engage in pretend play when intentional and systematic instruction, as well as sufficient support, are provided (Lifter et al., 2011; Jarrold, 2003). This suggests a critical need to explore interventions that effectively promote the pretend play skills of young children with disabilities, especially in natural settings.

Pretend Play Interventions for Young Children with Disabilities

A variety of interventions have been used to teach pretend play to children with disabilities. Specifically, systematic instruction (i.e., adult modeling, video modeling) and response prompting procedures (i.e., system of least prompts; constant time delay) are evidence-based practices that are effective in teaching pretend play to children with disabilities, especially children with ASD. These findings were highlighted in two recent reviews focusing on pretend

play interventions for children with ASD (Lang et al., 2009; Jung & Sainato, 2013). Jung and Sainato (2013) also pointed out that research using script training and pivotal response training to teach pretend play has shown positive effects. In addition to adult-implemented systematic instructions and prompting procedures, peer-mediated instruction (PMI) has also been successfully used to teach pretend play to children with disabilities (Lory et al., 2018; Patry & Horn, 2020). In the following sections, I present literature on pretend play interventions and different methods in teaching pretend play to young children with disabilities.

Adult Modeling and Prompting

Video modeling (VM) and response-prompting procedures (i.e., system of least prompts, constant time delay) have been widely adopted to teach pretend play to young children with disabilities and positive effects were detected in multiple studies (Barton, 2016; Jung & Sainato, 2013). In this section, adult modeling and prompting procedures, including video modeling and response-prompting procedures, are discussed.

Video Modeling (VM). VM has been identified as an evidence-based practice for teaching a variety of skills to children with disabilities, in particular for children with ASD (Cox & AFIRM Team, 2018; Odom et al., 2010; Wong et al., 2015). Video modeling has three major components: (a) video recordings of modeled target behavior, (b) the child observes the video recording of the model, and (c) the child is given an opportunity to imitate the modeled behaviors (Cox & AFIRM Team, 2018). Several studies have demonstrated positive effects of using VM to promote the pretend play of children with disabilities. For example, MacDonald et al. (2005) used VM to teach thematic pretend play to two children with ASD in preschool classrooms. A multiple-probe design study across three play sets was conducted. Three play scripts were developed, and each script had a sequence of 16 verbalizations and 14 coordinated

actions. Adult-modeled pretend play actions were recorded and shown to children on a screen in the classroom. At the beginning of each intervention session, the children watched the video models twice and then they were given a task cue to start playing. No further prompting or reinforcement was provided during the intervention. Results indicated that the children showed improvements in their scripted pretend play actions (i.e., motor responses that matched the actions of the video model and resulted in the same change in the environment as seen in the model) and verbalizations, and that they maintained their pretend play behaviors overtime. Generalization data was not reported. Although the children increased their use of scripted play actions, unscripted pretend play actions still remained low across intervention sessions. McDonald et al. (2005) suggested that future research should focus on investigate strategies that increases children's unscripted/independent pretend play behaviors.

Similarly, Dauphin et al. (2004) used VM along with matrix training and adult prompting to teach sociodramatic (pretend play) skills to a 3-year-old child with disabilities. The study took place at the child's home. Besides the VM and matrix training, prompts (i.e., verbal and physical prompts) were provided to the child during intervention. Although results showed that a significant increase was detected in the child's pretend play behaviors, it is unclear whether the increases were in prompted or independent pretend play behaviors. Generalization data again was not reported. Both studies provided promising findings; however, more research needs to be done to examine whether the use of VM can help increase independent pretend play as well as generalization of play skills across settings.

Response-Prompting Procedures. Response-prompting procedures are effective teaching strategies to support the learning of children with disabilities across various settings (Collins et al., 2018; Ledford et al., 2012). These procedures include graduated guidance,

constant time delay, progressive time delay, simultaneous prompting, and system of least prompts (Ledford et al., 2012; Wolery, Adult et al., 1992). In the next section, system of least prompts and constant time delay, the two prompting procedures that are commonly used to teach pretend play, are discussed.

System of Least Prompts (SLP). SLP, which uses a least-to-most prompting hierarchy, begins with a typical or natural antecedent (e.g., presentation of toys) and then the adult delivers increasingly intrusive prompts, but only if the child doesn't demonstrate the target behaviors (Barton, 2016; Collins et al., 2018). SLP has been used in several studies to teach targeted pretend play skills to children with disabilities (e.g., Barton et al., 2013; Barton, 2015; Barton, Gossett, et al., 2019; Qui et al., 2019; Saral & Ulke-Kurkcuoglu, 2020). One benefit of using the SLP is that it minimizes the interruption of children's play. By starting with a natural prompt, it is easier for teachers to fade prompts (Barton, 2015). For example, Barton (2015) taught pretend play to four preschool-age children with disabilities using the SLP and contingent imitation. The study took place in the children's preschool classrooms. Specific prompts used in each prompting hierarchy (i.e., independent level, modeling, and full physical prompt) were selected based on each child's learning performance and preferences. Data indicated that a functional relation was detected between the SLP and the children's increased levels of frequency and diversity of pretend play. All children engaged in more independent than prompted pretend play in intervention and those behaviors were maintained overtime, without teacher prompts. Generalization data showed that the children were able to generalize pretend play to different settings (i.e., unstructured free play time), with toys similar in function. This study provided strong evidence to support the use of SLP as an effective intervention in increasing and generalizing children's pretend play behaviors in natural settings. These positive effects in the

increases of child pretend play behaviors were also detected in Qiu et al. (2019). However, two of the four children showed some variabilities in their levels of independent pretend play, which limited the interpretation of the study.

In addition, Barton, Gossett, et al. (2019) conducted two single-case design studies to examine the effects of the use of SLP in increasing pretend play skills of a 3-year-old child with ASD. Study 1 focused on increasing diverse play actions; while Study 2 focused on increasing independent play sequences. Study 1 and 2 shared the same participant and setting (i.e., in a preschool classroom at a child-sized table). Results of both studies indicated that SLP is effective in increasing the pretend play diversity and repertoire for a child with ASD. This finding was consistent with the results in Barton (2015) which suggested that when pretend play actions were systematically prompted and modeled, they increased. Barton, Gossett, et al., (2019) also mentioned that the intervention was reintroduced to facilitate maintenance (in study 2). Although the child maintained her pretend play behaviors over time, it appeared that her rates of independent pretend play were relatively lower than that of intervention. This implies that it would be worthwhile to consider systematically fading prompts when teaching complex play behaviors.

Constant Time Delay (CTD). CTD uses a controlling prompt and two types of prompting conditions: a 0-second delay condition and a 3 to 5 -second delay condition (Wolery, Holcombe et al., 1992). In CTD, a fixed amount of time is provided between the instruction and the prompt as the learner becomes more proficient at using the new skill (Sam & AFIRM Team, 2015). During the 0-second delay condition, the stimulus and the controlling prompt are delivered concurrently; during the 3 to 5 -second delay condition, after the delivery of the stimulus, a specified time (3 or 5 second) is inserted before delivering the controlling prompt (Waugh et al.,

2011). This delaying of prompts ensures that children have the opportunity to respond independently. In a recent study conducted by Barton, Choi, et al. (2019), the authors assessed the effects of using CTD to teach sequences of pretend play in preschool classroom during free play. A multiple-probe design study across play behaviors was replicated across three preschool-age children with disabilities. During intervention, CTD was delivered and the controlling prompts for each child were selected based on teacher report and observation. Generalization was measured across adults (i.e., graduate students), and settings (i.e., dramatic play or block play area). All the children maintained their independent sequences of pretend play and generalized pretend play to nonintervention settings. This study demonstrated positive effects of using CTD as an instructional strategy for teaching pretend play. Results should be interpreted with caution, because functional relations between the use of CTD and increased levels of independent pretend play were only detected in two of the children. In fact, for one child, even with the adaptations to the CTD, no increases in pretend play behaviors were detected. After switching to SLP, the child's pretend play behaviors increased and maintained across all three toy sets. Barton and Choi, et al. (2019) thus suggested that when teaching pretend play skills, individual instructional adaptations may be needed to meet the unique learning needs of each child.

Involving Peers and Siblings in Play Interventions

Although adults serve as intervention agents or implementers in a majority of the early childhood experimental research, there is a strong empirical support for involving peers or siblings in interventions for young children with disabilities. Peer-mediated intervention (PMI) and sibling-mediated intervention (SMI) are two commonly used approaches to systematically teach peers and siblings to engage in positive and meaningful social interactions with children

with disabilities (Shivers & Plavnick, 2015; Steinbrenner et al., 2020; Walton & Ingersoll, 2012). More specifically, in PMIs and SMIs, peers or siblings receive training from an adult (e.g., professionals, caregiver) to deliver instructions or social initiations to support the learning of children with disabilities (Shivers & Plavnick, 2015; Steinbrenner et al., 2020). PMI is considered as an evidence-based practice in supporting children with disabilities across various developmental domains, including social, communication, joint attention, school-readiness and play skills (Chan et al., 2009; Chang & Locke, 2016; Goldstein et al., 2007; Kamps et al., 2015; Wang et al., 2011). For example, Kamps et al. (2015) examined the effects of a peer network intervention on the social communication, language performance and adaptive communication skills of children with ASD. Findings suggested that children with ASD, who received the peer networks intervention, demonstrated more growth in social initiation skills in natural settings. This result corresponded with both Odom (1991) and Sainato et al. (1992) findings that PMI is an effective practice to increase the social behaviors of children with ASD. This helps children with disabilities engage in more positive social and play behaviors, which, in turn, will support them in building friendships with peers (Hume et al., 2019; Odom, 2019).

Moreover, research has explored the potential benefits of including siblings in interventions, and studies have shown that SMIs can effectively promote the social, communication, imitation and play skills of young children with disabilities (Tsao & Odom, 2006; Walton & Ingersoll, 2012; Watkins et al., 2020; Glugatch & Machalicek, 2021). For instance, Walton & Ingersoll (2012) successfully trained siblings to use a reciprocal imitation procedure to increase imitation skills of their siblings with ASD. In another study conducted by Watkins et al. (2020), siblings were involved in an intervention focusing on increasing the positive social interaction between children with ASD and their siblings. Social interaction

increased between the siblings and the child with ASD as a result of the intervention. Sibling relationships are oftentimes the longest and most natural relationships people have, which provides a valuable source of support throughout their lives (Diener et al., 2014; Glugatch & Machalicek, 2021; McHale et al., 2016). Siblings also play unique roles in the development of children with disabilities (Ferraioli et al., 2012; McHale et al., 2016). Therefore, endeavors to strengthen the sibling relationships in early childhood should be explored. In the next two sections, I present play and pretend play literature involving peers and siblings, as well as discuss the benefits and challenges of this type of approach.

Peer-Mediated Intervention (PMI). In pretend play literature, peers play different roles in promoting the pretend play skills of young children across different stages of the intervention or study. For example, in Barton (2015), untrained peers were only present in generalization sessions. In such situations, peers served as play partners instead of intervention agents (i.e., providing instructions and model play behaviors for children with disabilities). Similarly, in Stahmer (1995), peers were only present during baseline and post-training session.

Previous research has indicated that PMI is a promising strategy to support the play of children with disabilities (Ganz and Flores, 2008; Goldstein & Cisar, 1992; Lory et al, 2017; Jaggy et al., 2020; MacDonald et al., 2009). For example, Goldstein and Cisar (1992) examined the efficacy of using sociodramatic scripts to teach pretend play to three children with disabilities and their neurotypical peers. Play scripts were developed and each child was assigned to a role. Children with disabilities and their neurotypical peers received the same most-to-least prompt hierarchy on play scripts. Peers were not trained on prompting pretend play for their peers with disabilities. In addition to the play scripts, adult prompts were provided to all children due to the low level of play behaviors and limited social interactions between the children. After the

introduction of adult prompting, all children increased their use of positive social behaviors and demonstrated higher levels of pretend play behaviors. MacDonald et al. (2009) also provided additional training to peers due to their low level of play initiations, despite the introduction of VM. This suggests that a certain level of adult support is needed to help peers initiate play and social interactions with their peers with disabilities (Patry & Horn, 2020; Odom, 2019). In both studies, children with disabilities and their peers engaged in higher levels of social interactions and pretend play as a result of the intervention. This improvement in social relationships and play skills highlights the importance of inclusion in early childhood settings.

Another benefit of involving peers in play-related interventions is that peers usually produce richer child-child interactions during play activities (Locke et al., 2012). Peers also provide less intrusive prompts, which decrease the likelihood of interrupting the play dynamic between children. For example, Zercher et al. (2001) trained neurotypical peers to model targeted pretend play actions, as well as facilitate the play engagement, for their peers with ASD. Children with ASD did not receive any direct prompts or modeling from an adult. Results of this study suggests that peers are able to carry out complex strategies, even when adult prompts are withdrawn. Involving peers in interventions is likely to help reduce reliance on teacher prompting and allow teachers to attend to other children or activities (Barton, 2008).

Sibling-Mediated Intervention (SMI). Many researchers have studied the potential benefits and effects of involving siblings in interventions for young children with disabilities. In a literature review conducted by Shives and Plavnick (2015), the authors examined SMI studies, specifically on roles of siblings and the effects of SMIs. A total of 17 studies were reviewed, and approximately 70% of the studies (n = 14) mentioned that siblings served as intervention agents (e.g., siblings were trained on various intervention strategies) or models (e.g., siblings were

video models who carried out targeted skills). Shives and Plavnick concluded that SMI is an effective strategy in promoting a variety of skills in young children with disabilities.

More specifically, research has shown the positive outcomes that SMIs bring in promoting the social, communication, imitation and play skills of young children with disabilities (Baker, 2000; Celiberi & Harris, 1993; Coe et al., 1991; Reagon et al., 2006; Tsao & Odom, 2006; Walton & Ingersoll, 2012; Glugatch & Machalicek, 2021). For example, Tsao and Odom (2006) examined the effects of training siblings to use specific social behavior strategies (i.e., get the child's attention, ask questions related to play theme, provide comments) in play activities to promote the engagement and social interactions of their siblings with disabilities. Results of the study provided promising evidence in teaching siblings to support social interactions for children with disabilities. Walton and Ingersoll (2012) also found that siblings of young children with ASD were able to use an imitation training procedure (i.e., contingent imitation, linguistic mapping, and modeling). Positive changes in children's imitation skills provided promising evidence for involving peers in imitation interventions. The siblings also reported having fun participating in the study.

Siblings have also been trained to use strategies to promote play skills of their siblings with disabilities. For instance, Coe et al. (1991) and Celiberi and Harris (1993) successfully taught siblings to use prompting to teach targeted play behaviors. In these two studies, siblings served as the intervention agents. In Baker (2000), however, siblings were play partners for children with ASD in a thematic game intervention incorporating child interests. Results of the study showed that children with ASD's appropriate play-related behaviors improved. Their positive social skills also increased. In addition, Reagon et al. (2006) examined the effects of using a combination of VM and SMI to teach pretend play to a child with ASD. Specifically,

four pretend play scenarios were developed, and one sibling served as the video model to perform targeted pretend play actions. During the intervention, the child with ASD first watched the video models, and then was instructed to play. The sibling did not receive additional training and was not instructed to provide prompts to the sibling. Findings of the study showed that the child with ASD imitated the play actions performed by the sibling and thus, engaged in higher levels of pretense behaviors.

In a recent study conducted by Glugatch and Machalicek (2021), the authors examined the effects of sibling behavior skills training (BST) targeting play facilitation strategies in increasing positive sibling play. Six sibling dyads were formed, and each dyad included one child with ASD and one sibling. In six of the four dyads, the sibling was older than the child with ASD. Findings of this study suggested that the brief sibling training on play strategies effectively increased the positive reciprocal play between siblings. This provides valuable insight into building or improving the relationships between children with and without disabilities. As highlighted in Baker (2000) and Shivers & Plavnick (2015), siblings can serve as natural play partners for children with disabilities, and thus, provide ample opportunities for social interactions and natural play scenarios. This speaks to the value of investigating and developing play-related interventions that involve siblings of children with disabilities.

Coaching in Early Childhood/Early Childhood Special Education (EC/ECSE) Settings

Research has consistently indicated that young children with disabilities have less variety in their play and demonstrate fewer spontaneous pretend play behaviors (Barton, 2015; Jarrold, 2003; Kasari et al., 2013). As reviewed in the previous sections, systematic adult modeling and prompting procedures (i.e., VM, SLP, CTD), as well as peer- or sibling-mediated interventions, have been identified as effective strategies in teaching pretend play to young

children with disabilities. To date, most of the literature on pretend play has occurred in early childhood classrooms and professional development (PD) has been an essential part of promoting early childhood educators' implementation of pretend play interventions.

PD has been identified as an effective strategy in enhancing teacher practices in EC settings (Snyder et al., 2015). PD is also associated with positive child outcomes (Reinke et al., 2012; Snyder et al., 2015). However, research has shown that traditional PD (e.g., didactic training, workshops) alone is not enough to change teacher behaviors (Kretlow & Bartholomew, 2010; Meadan et al., 2012) and support the sustained use of evidence-based practices (Artman-Meeker et al., 2015; McLeod et al., 2019). In fact, teachers need ongoing support to successfully implement interventions with fidelity (Kretlow & Bartholomew, 2010). A substantial amount of research has shown that coaching, a type of PD, is effective in increasing teachers' sustained use of teaching practices with fidelity in EC settings (Kretlow & Bartholomew, 2010; Snyder et al., 2015). Coaching provides teachers with opportunities to use newly learned practices while receiving performance feedback. It also allows time for teachers to engage in self-reflection, which is an important part of the coaching process.

Fox et al. (2011) presented a comprehensive coaching framework, called practice-based coaching (PBC). PBC is a job-embedded coaching model, with a focus on using action planning and performance feedback within the context of a collaborative partnership (Snyder et al., 2015). PBC has three major components: (1) shared goals and action planning (2) focused observation and (3) reflection and feedback (Snyder et al., 2015). With PBC, teachers receive explicit feedback that supports their implementation of interventions with fidelity, as well as emotional support (Snyder et al., 2015). One important feature of PBC is that coaches and teachers engage in reflective discussions. This provides opportunities for teachers to reflect on

their use of practices and engage in problem-solving conversations with the coach. With coaching, teachers receive systematic support that helps them implement practices accurately and consistently.

Various coaching approaches (i.e., self-coaching, peer coaching, expert coaching), as well as different delivery formats (i.e., face-to-face, distance coaching), have been used to enhance teaching practices with fidelity such as language skills, positive behavior supports and social-emotional skills (Snyder et al., 2015). For example, Meadan et al. (2012) used didactic training and face-to-face coaching to support three preschool teachers' use of naturalistic strategies to promote positive social play behaviors of children with disabilities. Although changes in child behavior were detected, the data was inconsistent.

Distance coaching (i.e., "bug-in-ear" coaching, email performance feedback) is an effective alternative way to face-to-face coaching. A growing body of literature has shown that distance coaching can effectively support teachers' use of evidence-based strategies with fidelity to increase positive child outcomes in areas such as communication, self-advocacy and social-emotional skills (Artman-Meeker & Hemmeter, 2013; Barton et al., 2018; Gomez et al., 2021; Hemmeter et al., 2011; O'Flaherty et al., 2019; Ottely & Hanline, 2014; Rosenberg et al., 2021). Since the importance of collaborative relationships has been identified as key to effective coaching in EC settings (Snyder et al., 2015), it is also important to ensure that positive teacher-coach collaborative partnerships are developed in distance coaching.

In some of the pretend play studies, the researchers served as the main implementers (e.g., Barton, Choi, et al., 2019; Barton, Gossett, et al., 2019; Saral & Ulke-Kurkcuoglu, 2020; Qiu et al., 2019). Early childhood educators play an important role in promoting positive

outcomes of young children in EC settings; therefore, it is critical to explore how coaching has been used to support teachers' use of effective practices with fidelity to teach pretend play.

Barton and Wolery (2010) used didactic training and performance feedback to support three preschool teachers in implementing an intervention package (i.e., SLP, contingent imitation, reinforcement) to teach pretend play. Four preschool-age children with disabilities participated in this study from preschool classrooms. Five toy sets (three for intervention, one for generalization, and one for the adapted SPA) was used. The coaching components included: (1) three didactic trainings and (2) performance feedback provided after each coaching session. The teachers received three 45-minute group didactic trainings on each toy set. During each didactic training, the coach (the first author) reviewed a six-page manual with the teachers. Teachers also watched two 10-minute videos, including modeling of the use of the intervention package, as well as pretend and non-pretend play behaviors demonstrated by a neurotypical peer. The teachers were also provided with opportunities to practice using the intervention package with nonparticipant children, and performance feedback was provided. Prior to each coaching session, a checklist with at least two examples of each type of pretend play behavior was provided to the teachers. The coach documented examples of each teacher's correct and incorrect use of the prompting procedure during coaching. After each coaching session, a one-page form with written feedback, as well as verbal performance feedback, was provided. Specifically, performance feedback included four examples of the teacher's correct use of the prompting procedure and the number of missed opportunities to prompt. Fidelity data on didactic training, the coach's delivery of feedback and teacher's use of the intervention, was collected. Results of the study revealed a strong functional relation between the teachers' use of the intervention package and the children's increased frequency and diversity of pretend play. The high intervention fidelity data

indicated that the teachers were able to accurately and consistently implement a complex prompting procedure in real life classrooms. However, findings of this study should be interpreted with caution because the relation between coaching and teachers' use of the intervention package was not evaluated.

Furthermore, Barton et al. (2013) specifically compared the effects of didactic training and didactic training plus performance feedback, on teachers' use of a complex intervention package (i.e., SLP, contingent imitation, behavior specific praise). Two single-case design studies were conducted. The coaching components and procedures in both studies were similar to those described in Barton and Wolery (2010). The only difference being, in Barton et al. (2013), in-vivo verbal prompts were also provided to the teacher during coaching sessions, while in Barton and Wolery, performance feedback was only provided after coaching sessions. Also, Study 1 didn't specify the number of prompts used in each session, while Study 2 indicated that performance feedback was provided at least five times during each coaching session. High fidelity data on didactic training and coaching procedures indicated that coaches were able to deliver coaching as planned. Results suggested that didactic training alone was not associated with positive changes in teacher behaviors. However, when coaching was introduced with performance feedback (provided during and after coaching), significant increases in teachers use of the intervention package was detected. This finding was consistent with existing literature (Kretlow & Bartholomew, 2010), suggesting that didactic training or workshops alone is not effective in changing teachers' behavior.

Barton (2015) replicated this study and came to the same conclusion. That is, the combination of didactic training and performance feedback are effective strategies for coaching teachers to use a complex teaching procedure to teach pretend play. Although these three studies

provided promising evidence for coaching teacher in EC settings, the coaching components adopted were similar across the three studies (i.e., didactic training and in-vivo feedback or feedback provided after coaching). Additionally, almost all of the coaching studies focusing on pretend play used face-to-face coaching. More pretend play coaching research needs to be done to examine the efficacy of using different coaching formats and components (e.g., distance coaching, video feedback, email performance feedback).

Caregiver-Implemented Interventions for Young Children with Disabilities

Caregivers are oftentimes considered as the first line of support for young children. The significant influence of positive caregiver-child interactions has been well documented in research (Kashinath et al., 2006; Powell & Dunlap, 2010). As young children usually spend a large portion of their day with their caregivers, caregiver-implemented interventions can serve as a way to ensure that effective instructions are occuring throughout daily routines in natural settings (Kemp & Turnbull, 2014; Trivette et al., 2010). Many studies have shown that caregivers can learn and use evidence-based practices to teach a variety of skills to their children with disabilities. In fact, caregiver-implemented intervention is identified as an evidence-based practice associated with positive child outcomes, particularly in the areas of language and communication skills (Brown & Woods, 2015; Gerow et al., 2018; Kaiser & Roberts, 2013; Meadan et al, 2016; Quinn et al., 2021; Windsor et al., 2019; Woods et al., 2004), imitation skills (Ingersoll & Gergans, 2007; Wainer & Ingersoll, 2015), and positive behavior support strategies (Benson et al., 2018; Fettig et al., 2015; Gerow et al., 2021). In addition to positive child outcomes, Ingersoll and Gergans (2007) highlighted that caregiver training and coaching can improve the quality of life for the family, as well as caregiver optimism on their ability to

influence their child's development. Thus, training and coaching with families has become an important way of supporting the development of young children in home settings.

Family-centered practices is recommended by the Division of Early Childhood for the Council for Exceptional Children (DEC) as a critical service delivery model in early intervention (EI) settings (DEC 2014). It highlights the value of training and coaching caregivers on implementing evidence-based practices for their children with disabilities in home settings. Hendricks (2009) also asserted that family-centered practices and planning is essential to the success of training and coaching caregivers to implement interventions. With an emphasis on identifying family strengths, valuing family beliefs and cultures, as well as develop collaborative caregiver-professional relationships, family-centered practices seek to engage caregivers as active participants in planning and implementing interventions for young children with disabilities (Friedman et al., 2012; Woods et al., 2011). Additionally, family-centered practice highlights the significance collaborative caregiver-professional partnerships to support a child's development and better address the concerns and priorities of families (Friedman et al., 2012). More specifically, Fettig et al. (2013) mentioned that building relationships with families is not always easy and ensuring equality between caregivers and professionals may be particularly critical in developing positive and collaborative partnerships with caregivers.

Increasingly, researchers have explored the effects of caregiver-implemented interventions. Caregiver coaching is commonly used to support caregivers' implementation of interventions with fidelity in home settings. Coaching literature on caregiver-implemented interventions has yielded promising results in increasing various skills of young children with disabilities (e.g., Brown & Woods, 2015; Fettig et al., 2015; Gerow et al., 2021; Ingersoll & Gergans, 2007; Kaiser & Roberts, 2013). Several systematic reviews on caregiver-implemented

interventions have identified effective coaching strategies for caregivers. These strategies include ongoing conversation and information sharing, observation, modeling, direct teaching, opportunities for practice (i.e., role-play), video or written examples, and in-vivo or video performance feedback (Barton & Fettig, 2013; Friedman et al., 2012; Powell & Dunlap, 2010; Tomeny et al., 2020). Tomeny et al. (2020) further investigated coaching components used in caregiver-implemented interventions, with a specific focus on (a) collaborative planning, (b) building on caregiver's competence, (c) guided practice, and (d) collaborative reflection and decision making. After reviewing 26 studies, they found that fewer than a quarter of the studies used all four coaching components. That is, most of the studies focused on building caregiver competence and providing guided practice. Collaborative coaching components such as planning, reflection and decision making were not adopted consistently. Findings of this review suggested that there is a significant gap in caregiver coaching literature.

In addition, there is a critical need for supporting early childhood professionals to provide effective training and coaching to caregivers of young children with disabilities (Marturana & Woods, 2012; Roman & Schnurr, 2020; Tomeny et al., 2020). Specifically, Romano and Schnurr (2020) stated that in the context of EI, caregiver coaching approach is particularly difficult to implement in early childhood settings. This is because it requires EI providers to be able to apply child-oriented skills (e.g., observing a child, child assessment) and adult-oriented skills (e.g., identify family priorities; practice strategies and identify routines to implement embedded instructions). One potential reason for this challenge is that EI providers have been primarily trained to work directly with children (McCormick et al., 2002). Recognizing the need to promote the use of family-centered practices and caregiver-implemented interventions, Marturana and Woods (2012) developed a distance mentoring model (DMM) to support EI

providers, to coach caregivers on implementing Family Guided Routines Based Interventions (FGRBI). Findings of this study extend the evidence for supporting EI providers in providing caregiver training. This has implications for future research on developing PD to support early childhood professionals in providing sustained supports to caregivers. In the next section, I discuss the effectiveness of caregiver-implemented interventions on both face-to-face and distance coaching.

Coaching Caregivers via Face-to-Face Format

Substantial research has shown that caregivers can effectively use evidence-based practices to increase various of skills in their young children with disabilities, when provided with training and coaching. For example, Ingersoll and Gergans (2007) examined the effects of caregiver-implemented reciprocal imitation training (RIT) on spontaneous imitation skills in three preschool-age children with ASD. A multiple-baseline design study was conducted, and three caregiver-child dyads were formed. This study was conducted in person in a small treatment room at an intervention center. In baseline, caregivers were asked to play with their child as they normally would at home for 10 minutes. During coaching, the coach (the first author) conducted 30-40 min individual coaching sessions. Coaching components included: (a) an explanation of the RIT techniques (i.e., contingent imitation, vocalizations, linguistic mapping), (b) ways to use RIT at home, (c) coach modeling of RIT with the child for 5-10 min, (d) opportunities for caregiver to use the techniques, and (e) performance feedback. In the later coaching sessions, only performance feedback was provided. Generalization sessions were conducted in the families' homes the end of the intervention, as well as a 1-month follow-up. Results indicated that all caregivers increased their use of RIT, both in the clinic setting, and the home setting, and they were able to maintain these skills. Increases in children's spontaneous

imitation skills were also detected. No fidelity data was reported. Caregivers reported that the intervention was easy to use and enjoyable. They also reported observing improvements in their children's imitation skills. Although the study offers a promising intervention option that can be easily implemented by caregivers, the lack of fidelity data on coaching sessions and caregivers' use of the RIT, limit the interpretation of the results.

In a study conducted by Fettig et al. (2015), the authors examined the effects of coaching on caregiver-implementation of a functional assessment-based intervention (FA-based intervention) to reduce children's challenging behaviors in home settings. A multiple baseline design study across participants was conducted, and three caregiver-child dyads were formed. Coaching components included (a) individualized caregiver training and (b) coaching with performance feedback. Each caregiver training lasted about 2hr and was conducted in the family's home. Caregiver trainings consisted of (a) discussion on the importance of social emotional development in young children and why challenging behaviors occur, (b) a review of child's functional behavior assessment data, (c) a presentation on possible strategies for different behavior functions, (d) a discussion on strategies and replacement skills to collaboratively develop a behavior support plan, (e) coach modeling of the behavior support plan during target routine, (f) video examples of FA-based strategies, and (g) opportunities for the caregivers to ask questions. Coaches also encouraged caregivers to share their parenting philosophies as well as their values. Immediately after caregiver trainings, intervention condition commenced. In intervention sessions, caregivers were instructed to implement the FA-based strategies, but no additional coaching was provided. Coaching condition commenced when caregiver-child dyads displayed stable trends in their behaviors. During coaching, caregivers received performance feedback on their use of the FA-based strategies at the end of each session. More specifically, the

coach (a) provided verbal feedback on what went well during the routine and what could be improved, (b) modeled missing or misused strategies, and (c) provided opportunities for caregivers to ask questions.

Maintenance condition was conducted immediately following the coaching phase and no coaching was provided. Fidelity data was also collected on the coaches' implementation of caregiver trainings and coaching sessions. Caregivers' correct use of the FA-based strategies were also measured using a checklist. Caregiver fidelity indicated that caregivers were able to implement the FA-based strategies consistently with high fidelity. Caregivers also reported high satisfaction regarding the FA-based caregiver coaching. Overall, results of the study provided promising evidence to support the use of FA-based caregiver intervention in decreasing young children's challenging behaviors in home settings.

Research has also examined the effects of coaching caregivers on implementing effective strategies to increase the language and communication skills of young children with disabilities. For example, Kaiser and Roberts (2013) conducted a randomized group design study to compare the effects of enhanced milieu teaching (EMT) implemented by caregivers plus therapists and therapists alone. A total of 77 children with disabilities and their caregivers participated in the study. Children were randomly assigned to one of the two experimental conditions. Children in the therapist-only EMT group received 36 intervention sessions (24 sessions in the clinic and 12 sessions at home). The caregiver plus therapist condition was identical to the therapist-only condition with the addition of caregiver trainings and coaching. Prior to the caregiver coaching sessions, caregivers participated in an interactive training (2-3hr) discussing language development, behavior, play, environmental arrangement and routines critical to the EMT intervention. Following the caregiver training, 1hr coaching sessions were provided to caregivers

in the clinic. Four major caregiver coaching components were included (a) training on a specific EMT strategy, (b) the therapist-implemented EMT session, (c) the caregiver-implemented EMT session with feedback, and (d) a review of the day's session and a plan for the next session. Specifically, coaches model the EMT strategies during therapist-implemented EMT sessions. In-vivo performance feedback on caregiver's use of the EMT strategies was then provided when caregivers implemented the EMT. Results showed that the caregiver plus therapist group demonstrated greater use of the EMT strategies than the therapist-only group and these effects were maintained overtime. The success of caregiver training and coaching on the EMT strategies also resulted in improved language skills in young children with disabilities.

Furthermore, Brown and Woods (2015) evaluated the effects of a caregiver-implemented communication intervention (the KidTalk-TaCTCS project; KTTP) on increasing the communication skills of young children with disabilities. Two communication interventions: EMT and Family-Guided Routines-Based Intervention (FGRBI), were integrated in the KTTP as the major communication intervention. A series of three nonconcurrent multiple-baseline studies replicated across nine child-caregiver dyads was conducted. The study took place in families' homes. Four certified SLPs with early intervention experience served as the interventionists. Caregivers received a total of 24 coaching sessions (once a week) and each coaching session lasted approximately 60-75 min. A coaching protocol on training caregivers to implement three communication strategies (i.e., responsive interactions, modeling and prompting/milieu teaching) in family-identified routines was developed. Six coaching components were included in the protocol: (a) setting the stage/information sharing, (b) observation, (c) direct teaching, (d) opportunities for caregivers to practice with feedback, (e) guided practice with feedback, (f) problem solving within each routine and across the session to build the caregivers' capacity to

embed communication strategies within their preferred routines. Maintenance sessions were conducted at 1 month and 3 months after coaching ended. Coaching was provided high fidelity and caregiver implementation fidelity was high as well. Results showed that caregivers demonstrated increased use of their communication strategies (i.e., responsive, modeling strategy), which led to increases in children's targeted communication skills. This study provides strong evidence for delivering high-quality communication services for young children and their families in a home-based learning environment.

Coaching Caregivers via Remote Coaching Format

One emerging form of caregiver coaching is the remote coaching model. Remote coaching can be provided in real-time/synchronous, asynchronous or a combination of both. (Akemoglu et al., 2020; Simacek et al., 2021). Specifically, Snodgrass et al. (2017) highlighted that remote caregiver coaching can be especially beneficial because it allows professionals to (a) work with families in a timely manner, (b) deliver coaching services to the family in the child's naturalistic settings, and (c) provide caregivers in remote areas access to high-quality support to implement evidence-based practices. With the advancements in technology, remote coaching provides caregivers a more flexible and feasible way to actively participate in coaching and receive feedback at any time. A number of recent empirical articles reported that caregivers have successfully implemented evidence-based practices via remote coaching models (e.g., Chung et al., 2020; Douglas et al., 2018; Meadan et al., 2016; Ingersoll et al., 2016; Suess et al., 2014; McDuffie et al., 2013; Quinn et al., 2021; Gerow et al., 2021; Wattanawongwan et al., 2020). An increasing number of studies has also indicated that caregivers of young children with disabilities find this form of coaching feasible and acceptable and is helpful in increasing their knowledge

about effective intervention procedures (Akemoglu et al., 2020; Chung et al., 2020; Simacek et al., 2021).

Several researchers have conducted literature reviews to examine the effects of remote coaching on supporting caregivers' implementation of strategies to promote the learning of their children with disabilities, especially in the areas of language and communication skills (e.g., Akemoglu et al., 2020; Simacek et al., 2021) and behavioral outcomes (e.g., Ferguson et al., 2019; Unholz-Bowden et al., 2020; Neely et al., 2017). For example, Akemoglu et al. (2020) reviewed 12 remote caregiver coaching studies, focusing on language and communication interventions. Reviews of this study suggests that caregiver-implemented intervention via remote coaching can be an effective alternative to face-to-face coaching. Promising results were also reported in Simacek et al. (2020) and Unholz-Bowden et al., (2020). In addition, Akemoglu et al. (2020) examined caregiver coaching components used in the reviewed studies. The findings suggested that some of the strategies that can effectively support caregiver implementation are: (a) modeling, (b) offering opportunities for practice (e.g., role-play), (c) observing caregivers during implementation, and (d) providing performance feedback. They also found that some other commonly used strategies were video examples of strategies and written instructions. These findings are consistent with other reviews. For instance, Unholz-Bowden et al., (2020) reviewed 30 remote coaching studies that trained caregivers on implementing behavioral procedures (i.e., functional analysis, functional communication training, antecedent-based procedures). Across studies, the most commonly used caregiver coaching components were: (a) performance feedback, (b) real-time coaching (within-session instruction), and (c) modeling (either via live or via a video model). These findings provide insights into incorporating effective coaching strategies into remote caregiver coaching models to support caregivers and their young

children with disabilities. However, Akemoglu et al. (2020) states that findings should be interpret with caution as limited information was provided in the reviewed studies, making it difficult to identify which strategies contribute to caregivers' success in acquiring skills.

In a study conducted by McDuffie et al. (2013), the researchers evaluated the effects of a combination of face-to-face caregiver training and hybrid caregiver coaching model (i.e., both in-person and remote coaching) on caregivers' use a naturalistic language intervention. A series of A-B replications using a quasiexperimental design study was conducted. 8 dyads were formed, and each dyad included one caregiver and one child with ASD. Caregivers participated in four face-to-face caregiver trainings (90-min). Caregiver trainings included, (a) a description of the naturalistic language intervention (i.e., verbal description, indirect prompting strategies, taking an active role in the child's play, use of questions to prompt child communication rates), (b) opportunities for discussion, (c) opportunities for role-playing, and (d) joint problem solving. Each face-to-face caregiver training was followed immediately by a face-to-face coaching session. During each face-to-face coaching session, the coach supported the caregiver in engaging in play with their child, observed the caregiver using the naturalistic language strategies, provided performance feedback and offered opportunities for discussion and questions. Upon completion of the first caregiver training session and the first face-to-face coaching session, caregivers received remote coaching (a total of 12 sessions) and the coaching procedures were the same as in face-to-face coaching. Each caregiver was provided with VTC equipment (i.e., a laptop with camera) for the remote coaching sessions. Results of the study provided promising effects on using the remote coaching model to increase caregivers use of naturalistic language strategies. McDuffie et al. (2013) also found that the caregivers used similar amounts of targeted strategies during remote coaching sessions as they did during face-

to-face coaching, suggesting that remote coaching can be an effective alternative coaching to more traditional forms of coaching. In addition, McDuffie et al. highlighted that using a combination of face-to-face coaching and remote coaching, successfully contributed to caregivers' improved use of effective language strategies, which has implications for future research.

Douglas et al. (2018) explored the effects of an online communication training model for caregivers of young children with disabilities. A single-case multiple probe design study across three dyads was conducted. Dyads included a caregiver and their child with ASD. This study was conducted in the family's homes and coaching sessions (10-15 mins) occurred 1-2 times per week. During baseline, caregivers were instructed to play with their child as they normally would, and no instruction was provided to caregivers. Immediately after baseline, caregivers participated in an online training, which consisted of six modules, focusing on strategies (i.e., POWR strategy) to support their child's communication skills during play activities. Each caregiver was able to access and complete the online training at their own pace, without deadlines. Specifically, each module consisted of quizzes and scenarios to help caregivers with acquisition and practice of the newly learned skills. Caregivers were also provided with individualized feedback within 48hr of the completion of each module through an online system. Upon completion of the online training modules, caregivers were instructed to implement the POWR intervention and were provided with opportunities to ask questions at the end of each post-training practice sessions. Additional coaching or feedback was not provided if the caregiver did not ask a direct question. Caregivers were also asked to complete a reflection form about what went well and what could be improved. Maintenance sessions were also conducted. Results indicated that this online training model increased the frequency of communication

opportunities delivered by each caregiver. Increases in child communication skills were also detected. Maintenance data; on the other hand, was varied. Despite the promising results, and caregiver' high satisfactions with the online training, issues in immediacy were detected in two caregivers' behaviors. One possible explanation is the lack of direct practice of newly learned skills, real-time coaching or coaching with feedback (Douglas et al., 2018). This has implications for future research.

The primary barriers for traditional EI service delivery are extensive travel time, cost and a shortage of EI service providers, especially for families living in rural areas. This has resulted in limited high-quality services provided to young children with disabilities (Akemoglu et al., 2020; Chung et al, 2020; Meadan et al., 2016). Recognizing this challenge, Meadan et al. (2016) developed an internet-based program, called the Internet-Based Parent-Implemented Communication Strategies (i-PiCS program). The goal of the i-PiCS program was to remotely train and coach caregivers to use naturalistic teaching strategies to improve the social communication skills of their young children with disabilities. A multiple baseline design study across strategies was conducted to evaluate the effects of the i-PiCS program. Three dyads were formed, and each dyad consisted of a caregiver and a child with ASD. This study was conducted remotely using an online videoconferencing service (i.e., Skype), either in the family homes or at other locations of their choices. An iPad was provided to each caregiver. Coaching sessions were recorded using a screen-capture software, called Camtasia.

Caregivers received both a remote training and remote coaching sessions with in-vivo performance feedback. The caregiver training was 45-min and had five components: (a) an overview of the social communicating intervention (i.e., three naturalistic teaching strategies), (b) a review of three naturalistic teaching strategies (i.e., modeling, mand-modeling and time

delay) using handouts and flowcharts, (c) screen-sharing of video examples on another caregiver's use of the strategies, (d) creating an action plan together, and (e) opportunities for ask questions. Caregivers were also trained on using environmental arrangement (EA) strategies to promote child motivation and interests in communication. Upon completion of the caregiver training, caregivers received remote (two, 30-min coaching session per week) for about 3.5 months. The coaches followed a 3-step protocol to conduct coaching sessions remotely. The protocols included, (a) a pre-observation meeting in which the caregiver and the coach discussed the targeted naturalistic teaching strategies and develop a plan to implement the strategies, (b) an observation of caregiver-child interaction for 5-7 min, and (c) a post-observation meeting in which the coach provided performance feedback. Fidelity data on caregiver training and coaching sessions, as well as caregivers' use of the naturalistic teaching strategies were collected. Results of the study suggested that caregivers were able to implement the intervention with high fidelity when remote training and coaching were provided. Increases in child communication skills were also detected. The findings of this study contribute to the evidence supporting caregiver-implemented interventions via remote coaching.

In spite of promising remote caregiver coaching literature, caregiver coaching via remote format has primarily focused on using real-time, synchronous format (Simacek et al., 2021). The effects of remote caregiver coaching via asynchronous format, however, are rarely evaluated. Asynchronous coaching provides caregivers with more flexibility to access and receive support at times that are convenient to them. It also allows caregivers to receive training when targeted routine or skills usually occur at times that are not ideal for real-time coaching. In early childhood settings, a growing body of literature has established the effects of coaching teachers

remotely, via an asynchronous format (i.e., email or video performance feedback, online training module). Future exploration into asynchronous caregiver coaching is warranted.

Gaps in the Literature

A large body of research has highlighted the importance of pretend play in children's development, especially in cognitive, language and social skills (Kasari et al., 2013; Lifter et al., 2011; Weisberg, 2015). Research has consistently found that children with disabilities have less variety in their play and demonstrate fewer spontaneous pretend play behaviors (Barton, 2015; Jarrold, 2003; Kasari et al., 2013). Several systematic instruction procedures, such as video modeling , response-prompting procedures (i.e., SLP, CTD), and peer or sibling models, have been used as effective strategies to teach pretend play to children with disabilities (e.g., Barton, Choi, et al., 2019; Barton, Gossett, et al., 2019; Glugatch & Machalicek, 2021; Goldstein & Cisar, 1992, MacDonald et al., 2005; Qui et al., 2019; Saral & Ulke-Kurkcuoglu, 2020;). With the complex nature of pretend play and the complexity of systematic instruction interventions, coaching should be provided to ensure that pretend play interventions can be delivered with fidelity, to increase positive child outcomes. To date, almost all of the pretend play literature has focused on coaching early childhood educators to teach pretend play in early childhood classrooms. Caregivers of young children with disabilities; however, rarely receive training and coaching on teaching pretend play to their children at home.

During the COVID-19 pandemic, instead of learning with peers in early childhood classrooms, young children with disabilities have had to learn from home. In a home-based learning environment, play may be particularly important because it provides natural and sustained opportunities for social interactions between children with disabilities and their siblings. With the value of play and the fact that children with disabilities usually have play

related IEP goals, caregiver coaching around pretend play is especially important in ensuring that young children with disabilities learn and practice play skills consistently and frequently. Given the significant gaps identified in the literature related to pretend play and caregiver coaching around pretend play reviewed in this chapter, there is a need to develop and evaluate coaching models that can be used to teach caregivers in using evidence-based strategies to enhance the play repertoire of young children with disabilities.

Chapter Three: Method

Participants

Participants included two caregiver-child-sibling triads. Each triad consisted of one caregiver, one child with autism spectrum disorder (ASD) and one sibling. Upon obtaining human subject approval from the Institutional Review Board (IRB), participants were recruited across the country through early childhood programs (i.e., university-based inclusive preschool), preschool teachers and Applied Behavior Analysis agencies. A digital recruitment flyer was shared with early childhood programs and the researcher's social media (i.e., Facebook, Instagram). Interested participants were encouraged to complete a screening form embedded on the recruitment flyer or contact the researcher with any questions. The screening form was housed in Qualtrics and consisted of eight questions, which provided general information about child's play skills as well as interactions with their sibling(s) and caregiver(s). On the screening form, caregivers were also asked whether the sibling would be interested in playing with their sibling with ASD. See Appendix A for a list of questions included on the screening form.

The inclusion criteria for focal children were as follows: (a) chronical age between 3 to 5 years old at the start of study, (b) a diagnosis of ASD, (c) ability to imitate at least five common actions with objects (e.g., place block on block, drive toy car back and forth, drink from a cup),

(d) ability to participate in play with an adult for at least 5 minutes at home, (e) ability to engage in some functional play, (f) fewer than five different pretend play behaviors based on a 5-min semi-structured play observation, and (g) consent form from caregiver. The inclusion criteria for siblings who served as play partners and were involved throughout the study were as follows: (a) interest in playing with their sibling with ASD, and (b) consent form from caregiver. Siblings with and without disabilities were eligible to participate in the study as long as the two inclusion criteria were met. Finally, the inclusion criteria for caregiver were as follows: (a) interest in learning new ways to engage in pretend play with their children, (b) willingness to participate in a 10-12-week coaching, and (c) the primary language spoken in the home is English.

The researcher followed a systematic protocol to determine whether triads met all inclusion criteria. Upon positive screening of caregiver and sibling inclusion criteria via an interest form, the researcher used direct behavioral observation to confirm focal child inclusion criteria. The researcher asked interested caregivers to provide a 5-min video of the focal child engaged in play. Detailed instructions were provided for recording the video (i.e., recommendations for toys to include that might provide more opportunities for pretend play such as kitchen sets, doctor kit or doll sets and how to upload the video). Caregivers were provided with instructions to use a mix of child's preferred home toys as well as toys that might provide more opportunities for pretend play.

Two caregivers recorded a 5-min video of them playing with their child. Upon confirming that the focal child's pretend play behaviors met the criteria, the researcher scheduled a 40-min individual meeting via video conferencing (i.e., Zoom meeting) with each caregiver. During the initial meeting, the researcher also gathered more specific information about the children, their preferred toys/activities as well as how their play and interactions looked like at

home. The researcher also worked with caregivers to determine potential toy sets to use for the study based on children's preferences.

Caregiver-Child-Sibling Triad 1: Ann, Sam and Ben

The first caregiver-child-sibling triad consisted of Ann (the caregiver), Sam (the focal child with ASD) and Ben (the sibling). Ann was an Asian female, aged between 30-39 years old. She had a master's degree. Ann lived with her husband and two children, and the family's primary language at home was English. Ann shared that for the past year, she regularly spent time playing with her children at home. Sam was a 4.5-year-old Asian male. He had a diagnosis of autism and was enrolled in a half-day inclusive preschool program. Sam regularly used two- and three-word phrases to communicate (e.g., play chase, go to the river etc.). His mom reported he was able to imitate five or more actions with objects and frequently play with his siblings and parents at home. Sam's mom also reported that he often engaged in some functional play (i.e., drive a car around, building with Magna-Tiles), but rarely engaged in pretend play. Sam primary played with vehicles (i.e., cars, trucks, airplanes), toy food, Magna-tiles, Duplos, stuffed animals, trampolines and monkey bars. He enjoyed playing chase with his brother. Sam's mom mentioned that he liked playing with his brother, but mostly engaged in parallel play (i.e. children play near each other with similar toys and talk to each other) as well as gross motor activities (i.e., play chase). Sam received speech and language therapy (SLP), occupational therapy (OT) and applied behavior analysis (ABA) from the school district and private agencies. Ben was a 6-year-old Asian male with no identified disabilities. He was enrolled in a half-day kindergarten. Ben's mom reported he engaged in frequent and complex pretend play. He often initiated play ideas and engaged in frequent conversations with others.

Caregiver-Child-Sibling Triad 2: Lea, James and Mia

The second caregiver-child-sibling triad consisted of Lea (the caregiver), James (the focal child with ASD) and Mia (the sibling). Lea was a White/European American female, aged between 40-49 years old. She had a bachelor's degree. Lea lived with her husband and two children, and the family's primary languages at home were both English and Portuguese. James was a 4-year-old White/European American male. He had a diagnosis of autism and was enrolled in a half-day inclusive preschool. James verbally communicated often by using two-and three-word phrases and simple sentences. James's mom reported that he engaged in frequent functional play and engaged in some pretend play. His mom described his play as solitary and rigid (i.e., liked to play on his own and usually had a specific way of playing with his toys). Playing with the toys differently often led to challenging behaviors such as meltdowns. James's mom also mentioned that he usually spent a short period of time with toys but was able to stay and play for at least 5 minutes at home. James primary played with vehicles (i.e., construction cars, trucks, trains), Duplos, and Kinetic sand. He also preferred playing with water and games that involved letters and numbers. He usually played with his sister before bedtime and he enjoyed playing gross motor games with his sister (e.g., play chase, hide and seek etc.). When it came to play involving toys, James preferred playing on his own and mostly engaged in parallel play and associate play, with some cooperative play with his sister. James received speech and language therapy (SLP), occupational therapy (OT) and applied behavior analysis (ABA) from the school district and private agencies. He also had a play-related IEP goal. Mia was a 9-year-old White/European American female, with no identified disabilities. She enjoyed playing with her brother. Although Mia's mom mentioned that she did not play with toys that her brother liked to play with due to their age gap, Mia expressed strong interests in playing more with her brother.

Coach

The researcher served as the coach; she was an Asian, female doctoral student in a special education program. She had a master's degree in Early Childhood Special Education and was a Board Certified Behavior Analyst (BCBA). As a pre-service special educator and behavior analyst, she had experience collaborating with families around social goals. She had also worked extensively on several research projects related to social-emotional coaching in classrooms.

Setting

The study took place in the families' homes. All contact between the researcher and the caregiver participants occurred virtually. Caregiver training sessions were conducted virtually over Zoom. Both caregiver behavior and child behavior were observed. The researcher provided options for caregivers to record play sessions on their own or the researcher could record the sessions in vivo remotely (i.e., Zoom meeting). Both caregivers preferred recording sessions on their own. To observe the caregiver-child-sibling triad, caregiver participants recorded play sessions in pre-identified play areas and uploaded videos to a secure shared Google Drive. Email feedback was provided to caregivers after each play session after baseline. The caregiver, the focal child and the sibling were present in all sessions (i.e., baseline, intervention, & maintenance); the researcher (the coach) was not present in any of the sessions. The researcher worked with each caregiver to identify play area and time of the day that would work for them to conduct the play sessions. Play sessions for caregiver-child-sibling triad 1 took place in the living room in the mornings; play sessions for caregiver-child-sibling triad 2 took place in a spare room in the afternoons.

Length of Play Sessions

The researcher followed a systematic decision-making guideline to work with the

caregivers to determine the length of the play sessions. Based on previous research (Barton et al., 2013; Barton 2015; Barton et al., 2019; Ledon et al., 2011), two options for session lengths were offered to caregivers: 5-min or 10-min. Once the session length was determined, it remained consistent throughout the entire study. The criteria for 5 minutes play sessions were: (a) the focal child had shorter attention span, (b) possibility of the occurrence of challenging behaviors if the session was longer then 5 minutes, or (c) the caregiver thought that 5 minutes was the right length to capture their children's growth in play and preferred a 5-min session. The criteria for 10 minutes play sessions were: (a) one or both of the children were particularly verbal/chatty and/or sought attention frequently from the caregiver, or (b) the caregiver thought that 10 minutes was the right length to capture their children's growth in play and preferred a 10-min session. Ann (caregiver of triad 1) determined that 5-min sessions were appropriate; and Lea (caregiver of triad 2) determined that 10-min sessions were appropriate. The length of play sessions remained the same for both triads throughout the study.

Materials

All sessions, including baseline, intervention and maintenance, were recorded by caregivers. Ann, caregiver of triad 1, recorded sessions using an iPod Touch provided by the researcher; Lea, caregiver of triad 2, recorded sessions using their own device, a smart phone (iPhone 7). Tripods were provided to caregivers to maximize the video recording devices' (i.e., iPod Touch, iPhone) ability to capture all interactions within play sessions. Prior to the first filming (i.e., baseline sessions), a technology training was provided to caregivers to ensure that they were able to set up their video-recording devices on the tripod as well as troubleshoot any questions they might have.

Caregiver Training Materials

A total of three packets with handouts were mailed to caregivers before each caregiver training session. Each packet consisted of a cover page (i.e., video-recording schedule, instructions for recording play sessions, and for uploading videos) and four handouts. See Appendix B for a sample packet. The first handout included a definition of the targeted type of pretend play with examples and non-examples of play behaviors; the second handout included a written description of the instructional procedures (i.e., the 4-step modeling procedure); the third handout included other important considerations when playing with children (i.e., how to use contingent imitation and verbal mapping, how to deliver specific praise, how to provide attention to both children); and the fourth handout included specific information to support caregivers in setting up a context for pretend play. In addition to the handouts, flash cards (2.95-inch x 2.95-inch) with pictures of play ideas were provided as visual cues for caregivers. All materials (i.e., handouts, flash cards) provided to caregivers were laminated.

Play Materials

A selection of individualized play materials was used in this study for each triad. All play materials used in the study were age appropriate and selected by the caregiver based on children's play preferences. Play materials for each triad consisted of a mix of home toys that the children typically played with as well as some new toys selected by the caregiver. To ensure that sufficient materials were available for the triads to play together, caregivers were provided with a $50 Amazon e-gift card to purchase duplicate toys or additional high-interest toys. For caregiver-child-sibling triad 1, play materials included: baby doll set (i.e., baby dolls, crib, bathtub, soap, highchair); kitchen toy set (i.e., utensils, cups, plates, bowls, cookware, cutting board, knife, tea pot sets, skillets, & kitchen with sink, stove and oven); toy food (i.e., donuts, fruits, vegetables, pizza, cakes, ice cream, bread); vehicle toy set (i.e., cars, trucks, airplanes, food truck); stuffed

animals; Duplos, Magna-tiles, and assorted objects (i.e., beads, paint brushes). For caregiver-child-sibling triad 2, play materials included kitchen toy set (i.e., utensils, cups, plates, bowls, pots, cutting board, knife); toy food (i.e., fruits, vegetables, bread); toy cookie set (i.e., sliceable cookies, toppings, cookie sheet); electronic toy microwave; juice blender toy set (i.e., a blender with base, jar and lid); toy dentist kit(i.e., toy teeth, examination tools, toothbrush, tooth paste, dental floss); vehicle toy set (i.e., trucks, ambulance, firefighter car); Kinetic sand with construction trucks toy set; a stuffed animal with a highchair and people figures; Duplos; and assorted objects (i.e., paint brushes, boxes). The same toys sets were used for each triad throughout the study. When relevant, caregivers were encouraged to include three of every toy for imitation purposes.

Experimental Design

A multiple-baseline design across pretend play behaviors was replicated across two triads (Ledford & Gast, 2018), and was used to examine the relation between a multi-component coaching package and caregiver's use of a 4-step modeling procedure with fidelity. This design included three conditions: (a) baseline condition, (b) caregiver-implemented intervention with coaching condition, and (c) maintenance condition. Caregiver-implemented intervention with coaching condition was introduced across three types of pretend play in a time-lagged manner. The order of pretend play behaviors was determined a priori, but visual analysis was used to determine phase changes. Caregiver-implemented intervention with coaching condition commenced with the first behavior when stability in level and trend had been achieved across all baseline tiers. The first coaching condition focused on functional play with pretense (FPP), the second focused on object substitution (OS), and the third focused on imagining absent objects (IAO). This procedure occurred in the same manner for each caregiver. The primary dependent

variable (DV) used to determine phase changes was caregiver's fidelity to the modeling procedure for each pretend play type (see Response Definitions section). Child's pretend play behavior was measured as a secondary, non-experimental variable. Visual analysis was used to examine the presence of experimental control and determine if a functional relation existed (Ledford & Gast, 2018; Kratochwil et al., 2013). As suggested by Kratochwill et al. (2013), a four-step process was used to conduct visual analysis: (a) documentation of a predictable and stable baseline, (b) examining within-phase patterns to assess whether stable patterns/trends with at least 5 data points per phase were detected, (c) comparison of data in the similar phase to evaluate effects, and (d) integration of all data from all phases to determine whether a functional relation existed. In the following section, experimental conditions are explicitly described.

Procedures

Introduction to Equipment. Prior to baseline, the researcher held a 20-min individual meeting with the caregivers via Zoom. The researcher virtually demonstrated how to set up the equipment (i.e., iPod Touch or iPhone device on tripod), and provided each caregiver with a handout describing tips for setting up the equipment and steps for uploading videos. Before each session, caregivers were expected to set up the recording equipment.

Baseline Conditions. During baseline, caregivers recorded five videos of them playing with their children (the length of play session for triad 1 was 10-min, and for triad 2 was 5-min) across two weeks. The caregivers were instructed to play and interact with their children as they normally would using the toy sets previously described. The caregiver said, *Let's play!* to begin each session. Only one play session was conducted per day. The caregiver did not receive instructions regarding the modeling procedure and strategies to expand children's play. However, to ensure that a consistent play context was established across conditions, a handout

was provided to each caregiver (Appendix C). This handout included guidelines for supporting the caregivers in setting up the play area and using general tips and strategies for playing with their children (i.e., how to use contingent imitation, verbal mapping, and provide attention to both children). No training and coaching were provided during baseline sessions.

Caregiver Training. Caregiver training sessions were provided following baseline and immediately before each caregiver-implemented intervention condition with each tier. The researcher provided three individual real-time trainings via Zoom. All trainings were recorded with caregiver consent. For Ann, the first training took 53 minutes; the second training took 35 minutes; and the third training took 18 minutes. For Lea, the first training took 45 minutes; the second training took 27 minutes; and the third training took 16 minutes. These trainings focused on using a 4-step modeling procedure to teach pretend play to their children and each training focused on one type of pretend play. The first training focused on functional play with pretense (FPP); the second training focused on object substitution (OS); and the third training focused on imagining absent objects (IAO). Operational definitions for the three targeted type of pretend play with examples can be found in Table 1.

Each caregiver training session consisted of (a) an introduction and rationale for teaching pretend play skills, (b) a description of the definition of the targeted type of pretend play and its importance, (c) written and video examples and nonexamples of the targeted type of pretend play, (d) a brief lecture/presentation on, or review of, the modeling procedure (i.e., the how and when), contingent imitation, different levels of prompts and verbal praise, (e) discussion and role-play opportunity, specifically on using the modeling procedure, (f) collaboration on play ideas for targeted type of pretend play with the toy sets, and (g) an opportunity for the caregiver to ask questions. Videos of the researcher using the modeling procedure during play were also

shared with caregivers. One major goal of this study was to teach caregivers ways to engage in pretend play with their children by modeling different types of pretend play. Throughout the trainings, the researcher made sure to communicate that the three types of pretend play behaviors are equally important. To help caregivers better understand this concept, the researcher also highlighted the importance of each type of targeted pretend play as well as discussed what outcomes different types of pretend play could lead to.

The modeling procedure used a four-step formula: (a) caregiver gets the child attention (e.g., “Hey look!”), (b) caregiver models the targeted type of pretend play behavior and describes the action while modeling it, (c) caregiver provides appropriate materials and says “your turn” as a prompt for the child to imitate the modeled play action, and gives the child about 5 seconds to respond, (d) caregiver provides behavior specific praise if the child does the modeled play action or an approximation of the modeled play action. If the child doesn’t imitate the action within 5 seconds of the model prompt, the caregiver provides an additional prompt of their choice. If the child does not respond to the additional prompt after 1 attempt, the caregiver will pause and begin a new trial. During the trainings, the researcher also discussed different types of prompts (i.e., physical, verbal, gestural, model prompt) they could use as the additional prompt. Caregivers were encouraged to use the types of prompts that they knew could best assist their child in doing a pretend play behavior, as well as their own comfort level.

In addition to training caregiver on using the 4-step modeling procedure, the researcher also discussed the appropriate moments to use the modeling procedure when playing with their children (see Figure 1). There were three potential scenarios where the caregiver could use the modeling procedure: (a) when the child is not playing (i.e., simply holding a toy in the hand) or engages in non-functional play, (b) when the child engages in functional play, but does not

engage in any pretend play or is not using the targeted type of pretend play, (c) when the child engages in repeated pretend play behaviors. The researcher specifically pointed out that in scenario (b) when the child starts to play but is not engaging in pretend play or using the targeted type of pretend play, caregivers should provide contingent imitation before modeling pretend play action. In addition, caregiver should alternate providing the modeling procedure to the focal child and the sibling. If the child's behavior did not fall under the three scenarios described above, the caregiver was instructed to provide contingent imitation and verbal praise to the child. This was to ensure that both children received equal attention.

Caregiver-Implemented Intervention with Coaching Condition. During this phase, caregivers used the modeling procedure when playing with their children. The caregiver said, *Let's play!* to begin each session. Then, the caregiver waited for approximately 15-20 seconds for the children to choose toys. If children started to play, the caregiver imitated their play and provided verbal praise 2-3 times. After the short period of contingent imitation and verbal praise, the caregiver then began using the modeling procedure with both children. To end the session, the caregiver said, *We are all done now. You can find something else to play with!* Similar to baseline, caregivers recorded five videos (10-min play session videos for triad 1; 5-min play session videos for triad 2) using the toy sets previously described at a pre-determined time (mornings for triad 1; afternoons for triad 2). Only one play session per day was conducted. Each triad had a video-recording schedule (i.e., when the caregiver was planning on doing the play session), and the researcher sent a brief text message to the caregivers as a reminder on the day of recording.

Caregivers uploaded videos to the secure shared Google Drive after each play session.

The researcher (the coach) viewed the video and provided email performance feedback in the same evening (within 9hr) as the day receiving the video. The email followed a 5-step protocol from Barton et al. (2013) and Hemmeter et al. (2011) with minor adaptations. The emails included: (a) a friendly, positive opening statement, (b) supportive feedback with 2-3 written and video examples on caregiver's correct use of the modeling procedure, (c) corrective feedback with 1-2 suggestions for correct use and improvement on missed opportunities, (d) a request for a response, and (e) a positive closing statement. For the video examples, the researcher edited short video clips of caregiver's use of the modeling procedure and explicitly pointed out which steps caregivers did well and what steps needed improvement. The video examples were uploaded to a secure shared Google Drive (the same Google Drive that the caregivers used to upload videos), and links to the video examples were embedded in each email. Percentage data on whether the caregivers respond to the emails as requested is presented in the procedural fidelity section in Chapter Three.

In addition to email feedback, the researcher also had brief phone calls or Zoom meetings with caregivers in between play sessions to provide additional support or explain specific concepts/ideas mentioned in the emails, if necessary. Requests for additional meetings or phone calls were initiated by the caregivers, with the exception of one meeting offered by the researcher. The researchers engaged in these conversations with both caregivers 2-3 times. For example, James, the focal child in triad 2, had difficulty with turn taking and sharing toys. This led to challenging behaviors during play sessions. The researcher met with Lea and brainstormed strategies (i.e., priming, praising appropriate sharing, duplicates of toys for modeling) that might help prevent the occurrence of challenging behaviors.

Maintenance Condition. Maintenance condition was scheduled to occur two weeks after

the caregiver-implemented intervention had ended. This phase was identical to baseline sessions, and the toy sets remained the same. No feedback was provided. However, due to changing family schedules and the start of the new school year, maintenance data for triad 1 (Ann, Sam and Ben) was collected about nine weeks after the intervention had ended; and no maintenance data was collected for triad 2 (Lea, James and Mia).

Response Definitions and Data Collection

Baseline, caregiver-implemented intervention with coaching, and maintenance condition was video recorded by caregiver participants for observation, data coding and analysis purposes. Videos submitted by caregivers were unedited, but caregivers were able to pause the video to attend to a child's personal care needs or if the child left the space. Videos were resumed when the child or caregiver returned to the play area. Only videos that were at least 5 minutes or 10 minutes were coded. If videos were longer than the determined session length (10-min play session videos for triad 1; 5-min play session videos for triad 2), the researcher randomly selected 5 minutes or 10 minutes for data coding and email feedback. Specifically, among the 22 videos submitted by Triad 1, 15 (68%) of them were longer than their determined session length (10-min), with an average length of 15min (unedited videos). Among the 20 videos submitted by Triad 2, 15(75%) of them were longer than their determined session length (5-min), with an average length of 6.5min (unedited videos). Videos were coded by the researcher. Coding was paused if the focal child or the caregiver was off screen; however, coding continued if only the sibling was off screen. Thirty-three percent of the videos were coded independently by a doctoral student in an early childhood special education program to establish interobserver agreement.

Dependent Measures

Caregiver Behavior. Caregiver's use of the 4-step modeling procedure with fidelity was the primary dependent variable of this study. Caregiver behavior data was collected on (a) the percentage fidelity to the modeling procedure for each targeted type of pretend play (i.e., functional play with pretense, object substitution, imagining absent objects) per session, and (b) the rate of modeling trials provided by each caregiver for each targeted type of pretend play in a session (trials per 5-min). See Table 1 for operational definitions and examples of the three targeted type of pretend play behaviors. A sample of the caregiver behavior data sheet can be found on Appendix D.

Percentage Fidelity to the Modeling Procedure. To measure fidelity, a trial-based modeling procedure protocol was developed. All trials had four steps, including: (a) caregiver using of an attentional cue, (b) caregiver modeling of pretend play action with appropriate materials and describing of the play action while modeling it, (c) caregiver providing of an opportunity for the child to do the modeled play action, (d) caregiver providing of a behavior specific praise to the child's pretend play behavior. Specifically, step (b) was measured in two parts: first, caregiver was assessed on whether they modeled a pretend play behavior with appropriate materials; then, caregiver was assessed on whether they described the play action while modeling it. Two additional items were assessed: whether caregiver initiated the modeling procedure under three scenarios as described previously; and if one additional prompt was provided when the child did not respond to the first model prompt.

Trials began when the caregiver provided an attentional cue, "*Look at me!" or "James, look at me!"*. For each trial, each step of the modeling procedure protocol was scored as "correct implementation", "incorrect implementation", or "no attempt" (Note: some steps might be coded as not applicable). However, steps coded as "incorrect implementation" or "no attempt" were

considered as incorrect, with no distinction made between these two in the analysis. To calculate the percentage fidelity to the modeling procedure, the sum of steps coded as correct implementation across trials per targeted type of pretend play was divided by the total number of steps possible across trials per targeted type pretend play (excluding steps that were not applicable), and multiplied by 100.

Rate of Modeling Trials. To calculate the rate of modeling trials provided per session, frequency count data was collected on the caregiver's modeling trials of each targeted type of pretend play per session and then was divided by 5-minute segments.

Child Behavior. Child behavior was measured as a secondary, non-experimental variable. There were two dependent variables for child behavior: (a) the rate of prompted and independent pretend play behaviors per targeted type of pretend play (i.e., functional play with pretense, object substitution, imagining absent objects) per session, and (b) the rate of social interactions between children per session. Pretend play behaviors and social interactions were operationally defined and measured for each child (i.e., the focal child and the sibling). A time-stamped event recording was used with child pretend play behaviors and social interactions using a 3-s agreement window. Frequency data was first collected and converted to rate per five minutes to account for different session lengths. A sample of the child behavior data sheet can be found on Appendix E.

Prompted pretend play behaviors were defined as a pretend play behavior occuring within 5s of the caregiver's prompt; and *independent pretend play behaviors* were defined as any spontaneous pretend play behavior (not imitative of the caregiver) or a pretend play behavior occuring 5s after the caregiver's prompt. A total of five types of pretend play behaviors were coded using a *Pretend Play Taxonomy* (Barton & Wolery, 2008, 2010): functional play with

pretense, object substitution, imagining absent objects, assigning absent attributes, and social pretend play. *Functional play with pretense (FPP)* was defined as using toys or actual objects in the manner in which they are intended without the reality-based outcome. *Object substitution (OS)* was defined as using an object as if it were something else. *Imagining absent objects (IAO)* was defined as performing an action as if an object were present. *Assigning absent attributes (AAA)* was defined as assigning roles or emotions to self, others or objects. *Social pretend play (SPP)* was defined as engaging in *social interactions* with the sibling using a single or multiple types of pretend play behaviors with the sibling. *Social interactions* included social response, and social initiation: social response was defined as any verbal, or nonverbal initiations that were directed toward a sibling and that were neutral or positive in nature; Social initiation was defined as a verbal and/or nonverbal response within 5s to an initiation made by a sibling that was neutral or positive in nature. Operational definitions with examples and non-examples for both pretend play behaviors and the social interactions are provided in Table 2.

Rate of Prompted and Independent Pretend Play Behaviors. Frequency count data was collected on a child's prompted and independent use of different types of pretend play per session. Frequency data for each type of pretend play as previously described, was then converted to rate per 5 minutes to calculate rate of prompted and independent pretend play behaviors.

Rate of Social Interactions. To calculate the rate of child social interactions (i.e., social initiations and social response) in each session, frequency count data of the use of social interactions was collected, and then converted to rate per 5 minutes.

Interobserver Agreement

Interobserver agreement (IOA) was calculated for 33% of all sessions for each phase of

the study for each participant. The researcher served as the primary data coder for this study, and a graduate student in an early childhood special education doctoral program served as the secondary data coder. The researcher held coder training, which included: (a) introducing a coding manual which defined the response definitions including examples and non-examples, and coding procedures, (b) discussing the response definitions (i.e., pretend play behaviors and social interactions) with written and video examples, (c) guiding the coding procedures using caregiver behavior and child behavior data sheets, and (d) coding non-study practice videos and achieving 80% or higher with the researcher for three videos. The researcher used a random number generator to select videos for IOA data coding; and the secondary coder was naive to the study conditions (except condition change from baseline to the first caregiver-implemented intervention with coaching tier). If any sessions fell below 80% IOA, the researcher would hold a data discussion with the secondary data coder and revise the coding manual with decision rules for future sessions. A minimum of 80% agreement was needed to resume video coding process.

IOA data on both caregiver behavior (i.e., the percentage fidelity to the modeling procedure, and the rate of modeling trials) and child behavior (i.e., the rate of prompted and independent pretend play behaviors, and the rate of social interactions) was measured. IOA for rate of modeling trials was calculated using the gross method (Ledford & Gast, 2018) by summing the total number of trials for each observer per session and dividing the smaller number of trials by the bigger number of trials and multiplying by 100. An average IOA for the rate of modeling trials was 92.82% across all participants and all conditions. The point-by-point method (Ledford & Gast, 2008) was used to calculate IOA for the percentage of the use of the modeling procedure with fidelity. Each step of the modeling procedure protocol was scored as an agreement or disagreement; an agreement was scored if both observers recorded the step as

correct implementation, incorrect implementation or not applicable in a trial. IOA was calculated by dividing the total number of agreements by the sum of agreements and disagreements and multiplying by 100. Across all participants and conditions, average IOA for the percentage of the use of the modeling procedure with fidelity was 85.44% (range = 80 – 89%). The point-by-point agreement method with time-stamped counts was used to calculate IOA for all child behaviors, whereby the number of agreements was divided by the sum of agreements and disagreements and multiplying by 100. Any event occur within 3-s was counted as an agreement. Average IOA for child's pretend play behaviors and social interactions was 87.24% (range = 77 – 96%). IOA data by participant and experimental condition are presented in Table 3.

Procedural Fidelity

Procedural fidelity was measured in three ways. First, a training protocol checklist (Appendix F) was used to ensure that the researcher conducted the caregiver training sessions as planned. The checklist had 10 components, including (a) sending a coaching packet before the training, (b) introducing the importance of pretend play and the rationale for teaching pretend play, (c) describing the importance and definition for one targeted type of pretend play, (d) providing written and video examples and non-examples of the targeted type of pretend play, (e) describing or reviewing the modeling procedure, (f) describing or reviewing the contingent imitation and verbal praise, (g) providing role-play opportunities, (h) provide feedback on the caregiver's use of the modeling procedure during role-play, (i) brainstorming pretend play ideas, and (j) providing time for questions. All three caregiver training sessions were recorded, and the videos were viewed by a second graduate student in the early childhood special education doctoral program. Fidelity of implementation was 100% for all three observations, indicating that the trainings were conducted as intended.

During the caregiver-implemented intervention with coaching sessions, a second procedural fidelity checklist (Appendix G) was used to measure the coach's (the researcher) adherence to the email feedback protocol. The checklist had 5 components and assessed the following: (a) a text message was sent to the caregiver on the day of recording as a reminder (b) the coach started the email with a friendly and positive statement, (c) supportive feedback with 2-3 written examples and video example of the caregiver's correct use of the modeling procedure was provided, (d) corrective feedback with 1-2 suggestions for improvements, including missed and/or incorrect use of the modeling procedure, (e) the coach ended the email with a positive closing statement. The coach also requested a response to each email from the caregivers. Two graduate students, who did not serve as a coach, assessed all email feedback. The coach followed 100% of the procedures for 100% of the emails across both caregiver participants and all sessions during the caregiver-implemented intervention with coaching phase. The coach also recorded every return email response from the caregivers. During the caregiver-implemented intervention with coaching condition, Ann (caregiver of triad 1) responded to 12 of the 15 (80%) emails and all emails responses were before the next play session; Lea (caregiver of triad 2) responded to 11 of the 15 emails and 10 (66.67%) of them were before the next play session. Procedural fidelity data was also collected on each video submitted by caregiver participants. A 6-item checklist (Appendix H) was used to assess whether: (a) toy sets were visible and arranged, (b) only the caregiver, the child and the sibling were present, (c) the caregiver used an opening verbal signal to begin the session or there was a clear beginning to the session, (d) the caregiver used an ending verbal signal to end the session or there was a clear ending to the session, (e) the session was at least 5 minutes for triad 2 or 10 minutes for triad 1, and (f) there was no visible evidence of setting events (e.g., fatigue, illness, hunger, etc.). Procedural fidelity

of submitted videos was 83.33% for triad 1, and 83.33% for triad 2. Specifically, both caregivers record the videos followed all six of the components, except for item (d). In most cases, caregivers simply ended video recordings when the pre-determined session time was up.

Social Validity

Upon completion of the final caregiver-implemented intervention with coaching phase, caregiver participants completed an online social validity survey (Appendix I.) created to assess the utility, acceptability, and feasibility of the multi-component coaching package. The social validity survey was developed using Qualtrics. Specifically, they responded to 15 Likert-type 5-point scale questions and 6 open-ended questions about the trainings, training materials (i.e., handouts), email feedback, understanding and using the modeling procedure as well as pretend play skills, whether they would continue using the strategies, whether they would recommend the intervention to other families, and whether they noticed changes in their child's pretend play (i.e., engaging in pretend play with other children, other family members or in different settings) and their social interactions with them or their sibling.

Chapter Four: Results

Caregiver Behavior

The results of the multi-component coaching package on caregiver behavior are shown in Fig. 2 for Ann and in Fig. 3 for Lea. Figure 2 and Figure 3 display both the percentage fidelity to the modeling procedure in each session (closed circle) and the rate of modeling trials provided by a caregiver per 5 minutes in each session (open square).

Ann (Caregiver of Triad 1)

Ann demonstrated low and stable levels of percentage fidelity to the modeling procedure

with the three targeted pretend play behaviors during baseline (range = 0 – 28.77%). She had a moderate rate of modeling trials on functional play with pretense (FPP) (*M* = 11.9 trials per 5-min; range 7.5 – 17), but very low rates of modeling trials on both object substitution (OS) and imagining absent objects (IAO). The caregiver-implemented intervention with coaching condition commenced with FPP, the first behavior. Following coaching, there was an immediate increase in level with a variable but increasing trend on her percentage fidelity to the modeling procedure (*M* = 66.15%; range 60 – 100%). Notably, a slight downward trend began at session 12. Her rate of modeling trials had a decrease in level, averaging 5.07 trials per 5-min (range 1.5 – 14), with a somewhat variable, decreasing trend. With the commencement of the coaching with the next tier (OS), Ann's percentage fidelity to the modeling procedure on FPP initially increased to 100% (session 11) and remained above 60% for the remainder of the coaching sessions with a relatively stable level. Her rate of modeling trials on FPP initially decreased dramatically, but quickly stabilized for the remainder of coaching. There were no overlapping data between baseline and coaching.

Ann's percentage fidelity to the modeling procedure and rate of modeling trials on the second target pretend play behavior, OS, remained low and stable during baseline when the coaching commenced with FPP. With the introduction of coaching on OS, Ann showed a clear increase in level and trend in her fidelity. Her percentage fidelity to the modeling procedure increased to 77.63% in the first OS coaching session (session 11) and improved to 93.55% in the fourth OS coaching session (session 14). Data remained at a high level of fidelity with some variability over the remainder of coaching sessions (*M* = 82.41%; range 66.67 – 100%). Her rate of modeling trials on OS also had an initially increase in level, followed by a gradual decreasing trend. Data remained stable with minor variability (*M* = 3.2 trials per 5-min; range 0.5 – 6) for

the remainder of coaching, and no overlap with baseline. When the coaching commenced with the subsequent tier (IAO) after session 15, Ann's percentage fidelity to the modeling procedure on OS briefly decreased, but quickly stabilized at a similar level than previous data points with some variability. She reached a maximum of 100% fidelity to the modeling procedure during the last coaching session (session 20). Her rate of modeling trials on OS decreased slightly in level after session 15 but remained well above baseline.

Ann's percentage fidelity to the modeling procedure (range = 0 – 15.17%) and modeling trials on IAO were at low and stable levels during baseline. No changes in baseline were associated with the introduction of coaching on OS or FPP. When coaching was introduced with IAO, Ann demonstrated an immediate increased level, with an increasing trend, on her percentage fidelity to the modeling procedure (*M* = 79.06%; range 66.67 – 96.67%). During the last coaching session (session 20), she reached 96.67% fidelity to the modeling procedure. There was also an increase in her level of modeling trials, which remained relatively stable (*M* = 3 trials per 5-min; range 2.5 – 3.5 trials per 5-min) for the remainder of coaching.

Maintenance sessions were conducted nine weeks after coaching had ended, and two data points were collected for maintenance condition. Ann maintained her use of the modeling procedure on all three targeted pretend play behaviors during the maintenance sessions. Her percentage fidelity to modeling procedure was 91.3%, 70.61%, and 92.89% for FPP, OS and IAO, respectively.

In addition to the percentage fidelity to the modeling procedure, Ann's average fidelity for each component of the modeling procedure in baseline, intervention and maintenance condition are displayed in Fig.4. As described in Chapter 3 (Method), a trial-based modeling procedure protocol was used to measure fidelity. Each trial had four steps, including: step (a) get

the child's attention, step (b) model one play action with appropriate materials and describe the play action, step (c) provide an opportunity for the child to do the play action, and step (d) provide descriptive praise. Specifically, step (b) was measured in two parts: step (b) whether the caregiver model a pretend play behavior; step (b.1) whether they describe the play action. Two additional items were also assessed: step (a.1) whether the caregiver initiated the trial under three appropriate scenarios; step (d.1) whether the caregiver provide an additional prompt if needed.

For the overall average fidelity for each modeling procedure component across all three targeted types of pretend play, in baseline, Ann's lowest fidelity was on *step (a) get the child's attention*, and her highest fidelity was on *step (a.1) the trial was initiated under the three scenarios*. During intervention, her lowest fidelity was on *step (d.1) provide an additional prompt if needed*, and her highest fidelity was on *step (a.1) the trial was initiated under the three scenarios*. In addition to the overall average fidelity for each component, Fig.4 also demonstrates average fidelity for each component for FPP, OS, IAO, respectively. During baseline, Ann's component fidelity on FPP, OS, and IAO was low, with the exception of the fidelity on FPP step (a.1). During intervention, her lowest component fidelity for FPP was on *step (d) provide descriptive feedback*; OS was on *step (a) get the child's attention;* and IAO was for *step (d.1) provide an additional prompt if needed*. Ann's highest component fidelity for FPP, OS and IAO was the same in intervention: *step (a.1) the trial was initiated under the three scenarios.* Also, her fidelity on *step (b)* was higher on OS and IAO than FPP in intervention.

Ann demonstrated a consistent pattern of responding across target pretend play behaviors, indicating a functional relation between the coaching and her percentage fidelity to the modeling procedure. In all tiers, Ann displayed a stable and low implementation of fidelity during baseline, with an immediate increase following coaching and no overlap with baseline. In addition, it

seems likely that high implementation fidelity to the modeling procedure is related to the rate of modeling trials provided in a session. That is, Ann's highest fidelity to the modeling procedure on FPP was when she provided 2 trials per 5 minutes (session 11); her highest fidelity on OS was when she provided 0.5 trials per 5 minutes (session 10); and her highest fidelity on IAO was when she provided 2.5 trials per 5 minutes (session 20).

Lea (Caregiver of Traid 2)

Lea demonstrated low and stable levels of percentage fidelity to the modeling procedure with the three targeted pretend play behaviors during baseline (range = 0 – 29.74%). She had a moderate rate of modeling trials on FPP (*M* = 17.4 trials per 5-min; range 15 – 19) but had very low rates of modeling trials on both OS and IAO. The caregiver-implemented intervention with coaching condition commenced with FPP, the first behavior. There was no change in her percentage fidelity to the modeling procedure until the second coaching session (session 7). During session 7, Lea's fidelity increased considerably from the previous data point (from 18.75% to 41.3%), followed by an increasing trend with minor variability (*M* = 48.70%; range 18.75 – 61.46%). Her rate of modeling trials was moderately variable, and had a decrease in level, averaging 8.27 trials per 5-min (range 2 – 15). With the commencement of the coaching for the next tier (OS), Lea's percentage fidelity on FPP initially decreased slightly, but quickly stabilized, and remained well above baseline levels for the remainder of coaching. Her rate of modeling trials on FPP also decreased, with a gradual decreasing trend with some variability for the remainder of coaching. There were no overlapping data between baseline and coaching, with the exception of session 6.

Lea's percentage fidelity to the modeling procedure and rate of modeling trials on the

second target pretend play behavior, OS, remained low and stable during baseline when the coaching commenced with FPP. With the introduction of coaching on OS, Lea showed a clear increase in level and trend in her fidelity. Her percentage fidelity to the modeling procedure increased to 53.13% in the first OS coaching session (session 11) and improved to 72% in the fourth OS coaching session (session 14). Data remained at a moderate-high fidelity with some variability over the remainder of coaching sessions (*M* = 60.68%; range 53.13 – 85.71%). Her rate of modeling trials on OS had an initial increase in level, followed by a downward trend began at session 7. Data was somewhat variable for the remainder of coaching (*M* = 4.25 trials per 5-min; range 0 – 10), and no overlap with baseline. It is notable that following session 13, Lea and her children were absent for five weeks due to traveling and sickness. This is indicated by a dashed vertical line on Fig. 3. This 5-week break did not result in decreasing fidelity on OS. In fact, upon return, Lea's percentage fidelity to the modeling procedure had a considerable increase in level (from 56% to 72%) When the intervention commenced with the subsequent tier (IAO) after session 15, Lea's percentage fidelity to the modeling procedure on OS briefly decreased, followed by an accelerating trend. She reached 85.71% fidelity to the modeling procedure during session 18. Her rate of modeling trials on OS decreased in level after 15, but remained above baseline, with the exception of the last two sessions. She did not initiate any OS trials during the last two sessions (session 19 and 20).

Lea's parentage fidelity to the modeling procedure (range = 0 – 10.12%) and modeling trials on IAO were at low and stable levels during baseline, and no changes were associated with the introduction of coaching in previous tiers. There was; however, a slight increase in her level of fidelity in the last baseline session (session 15). When coaching was introduced with IAO,

Lea demonstrated an immediate increased level with some variability on her percentage fidelity to the modeling procedure over the remainder of coaching sessions (*M* = 61.10%; range 51.28 – 83.33%). Specifically, during the second IAO coaching session (session 17), she reached 83.33% fidelity. There was also an immediate increase in her level of modeling trials, but the data points were variable (M = 4.8 trials per 5-min; range 1 – 7). Because of changing of family schedules and the start of the new school year, data was not collected on maintenance for Lea.

In addition to the percentage fidelity to the modeling procedure, Lea's average fidelity for each component of the modeling procedure in baseline and intervention condition are displayed in Fig.5. For the overall average fidelity for each modeling procedure component across all three targeted types of pretend play, in baseline, Lea's lowest fidelity was on *step (d) provide descriptive*, and her highest fidelity was on *step (a.1) the trial was initiated under the three scenarios*. During intervention, her lowest fidelity was on *step (b.1) describe the play action*, and her highest fidelity was on *step (a.1) the trial was initiated under the three scenarios.* In addition to the overall average fidelity for each component, Fig.5 also demonstrates Lea's average fidelity for each component for FPP, OS, IAO, respectively. During baseline, Lea's component fidelity for FPP, OS, and IAO was low, with the exception of the fidelity on FPP step (a.1). During intervention, her lowest component fidelity for FPP and OS was on *step (d) provide descriptive feedback;* and IAO was for *step (b.1) describe the play action*. Lea's highest component fidelity for FPP, OS and IAO was the same in intervention: *step (a.1) the trial was initiated under the three scenarios.* Also, her fidelity on *step (b)* was higher on OS and IAO than FPP in intervention.

Lea's implementation fidelity to the modeling procedure showed an immediate increase

across all three pretend play behaviors, with some variability on OS and one overlapping data point between the first FPP coaching session and the last baseline session; thus, a functional relation was identified between the coaching and the percentage fidelity to the modeling procedure. In addition, it seems likely that high fidelity to the modeling procedure is related to the rate of modeling trials provided in a session. That is, Lea's highest fidelity to the modeling procedure on OS was when she provided one trial per 5 minutes (session 18); and her highest fidelity on IAO was when she provided one trial per 5 minutes (session 17). Lea's fidelity to the modeling procedure on FPP; however, showed otherwise: Her highest fidelity on FPP was on session 10 (61.46%) while providing 15 modeling trials per 5 minutes.

Child Behavior

The results of the multi-component coaching intervention on child behavior for Sam, Ben, James and Mia are shown in Fig. 6 through Fig. 9, respectively, which display each child's use of the three targeted type of prompted and independent pretend play behaviors in rate per 5 minutes. The three targeted prompted and independent pretend play behaviors (i.e., FPP, OS, IAO) are shown within each tier for baseline, caregiver-implemented intervention with coaching, and maintenance sessions. All child participant' social interactions in rate per 5 minutes during baseline (pre-intervention) and caregiver-implemented intervention (intervention) is in Fig. 9.

Sam (Focal Child of Triad 1)

As shown in Fig. 6, Sam's prompted and independent pretend play behaviors (i.e., FPP, OS, IAO) were low during baseline. Sam demonstrated slightly more prompted FPP (*M* = 3.6 behaviors per 5-min; range 2 – 4.5) than independent FPP (*M* = 1.5 behaviors per 5-min; range 0 – 2). With the introduction of the coaching targeting FPP, his rate of prompted FPP decreased, averaging 2.43 behaviors per 5-min (range 0.5 – 4.5) followed by a decreasing trend,

with a decrease in level across the remainder of intervention sessions. With independent FPP, his pattern of responding was variable. Initially, he showed an increasing trend, with an increase in level, and a downward trend began at session 14, averaging 2.8 behaviors per 5-min (range 1 – 7) across the remaining intervention sessions. Notably, Sam engaged in his highest rate of independent FPP (7 behaviors per 5-min) during session 13. Overall, with the introduction of the coaching intervention, Sam demonstrated slightly more independent FPP (*M* = 2.8 behaviors per 5-min) than prompted FPP (*M* = 2.43 behaviors per 5-min).

Sam's rates of prompted and unprompted OS remained low and stable during baseline when the coaching commenced with FPP. With the introduction of coaching on the second targeted pretend play behavior, OS, his rate of prompted OS increased immediately, and quickly stabilized at levels relatively higher than baseline, with minor variability until session 15. His rate of prompted OS climbed to 2.5 behaviors per 5-min and remained at the same level for two session, following a gradual decreasing trend but remained above baseline levels for the remaining intervention sessions. During this condition, his demonstrated an average rate of 1.95 behaviors per 5-min (range 0.5 – 3). Sam demonstrated a minor overlapping in his independent OS between the first OS session and baseline. His rate of independent OS remained low, with a slight increase in level (*M* = 0.8 behaviors per 5-min; range 0 – 2.5). Sam engaged in his highest rate of independent OS (2.5 behaviors per 5-min) during session 18, followed by a downward trend across the remaining three intervention sessions. Overall, during this condition, Sam engaged in relatively more prompted OS (*M* = 1.95 behaviors per 5-min) than independent OS (*M* = 0.8 behaviors per 5-min).

Sam's rates of prompted and independent IAO remained low during baseline when

coaching was introduced on FPP or OS. When coaching was introduced with IAO, Sam's prompted IAO increased immediately and quickly stabilized for the remainder of intervention (*M* = 2 per 5-min; range 1 – 2). However, Sam did not engage in any independent IAO. During maintenance, Sam's prompted rates (*M*) were 1, 1, and 2 behaviors per 5 minutes for FPP, OS, and IAO, respectively. His independent rates (*M*) were 1.75, 0.25, and 0.25 behaviors per 5 minutes for FPP, OS, and IAO, respectively.

Sam's rates of social interactions in baseline condition (pre-intervention) and caregiver-implemented intervention with coaching condition (intervention) are displayed in Fig.10. In baseline, Sam engaged in a rate of 0.4 social interactions, on average; and in intervention, he engaged in a slightly higher rate (*M* = 0.53 per 5-min) of social interactions with his brother. In addition, as shown in Fig 11, Sam did not engage in any social pretend play during baselines sessions. During intervention sessions, his rate of social pretend play increased to 0.37 behaviors per 5 minutes. Specifically, he started to engage in substantially more social pretend play after session 12.

No effects were detected in all three of Sam's prompted and independent pretend play behaviors (i.e., FPP, OS, IAO). However, as presented in Fig.13, during caregiver-implemented intervention with coaching condition (intervention), he demonstrated a total of 15 novel independent pretend play behaviors (new behaviors that were not present during baseline sessions) after the commencement of coaching intervention in session 6. Sam demonstrated an average of 1 novel independent pretend play behaviors for 9 of the 20 intervention sessions.

Ben (Sibling of Triad 1)

As shown in Fig.7, James displayed low and stable levels on his prompted and

independent OS and IAO during baseline. He had a medium level for his rate of independent FPP with high variability (*M* = 6.3 behaviors per 5-min; range 0.5 – 8.5). He demonstrated considerably more independent FPP than prompted FPP (*M* = 0.7 behaviors per 5-min; range 0 – 1.5) in baseline. With the introduction of the coaching targeting FPP, Ben's rate of prompted FPP remained at stable and similar levels as in baseline for the remainder of intervention sessions (*M* = 0.5 behaviors per 5-min; range 0 – 1.5). With independent FPP, his pattern of responding was variable. Initially, he demonstrated his highest rate of independent FPP during session 6 (10.5 behaviors per 5-min), following by a decreasing trend with moderate variability across the remaining intervention sessions (*M* = 3.43 behaviors per 5-min; range 0 – 10.5) Overall, with the introduction of the coaching intervention, Ben continuously demonstrated a relatively higher rate of independent FPP (*M* = 3.43 behaviors per 5-min) than prompted FPP (*M* = 0.5 behaviors per 5-min).

Ben's rate of prompted and unprompted OS remained low and stable during baseline when the coaching commenced with FPP. With the introduction of coaching on the second targeted pretend play behavior, OS, his rate of prompted OS remained at stable low levels, similar to baseline (*M* = 0.7 behaviors per 5-min; range 0 – 2). Ben did not engage in any prompted OS during the last five intervention sessions (session 16-20). His rate of independent OS increased initially during session 11(2 behaviors per 5-min), with a slight increasing trend across the remaining three intervention sessions (*M* = 0.8 behaviors per 5-min; range 0 – 2). Although with a stable low level, six of ten sessions exceeded baseline levels. Overall, during this condition, Ben engaged in similar rates of prompted OS (*M* = 0.7 behaviors per 5-min) and independent OS (*M* = 0.8 behaviors per 5-min).

Ben's rates of prompted and independent IAO remained low during baseline when

coaching was introduced on FPP or OS. When coaching was introduced with IAO, there was a slight increase in his rate of prompted IAO; although it remained at low levels, with only one session above baseline (*M* = 0.2 per 5-min; range 0 – 1). However, Ben's rate of independent IAO immediately increased to 4 behaviors per 5 minutes and maintained at the same level for two sessions. Following a downward trend, his rate of independent IAO increased to 5 behaviors per 5-min in the final session, averaging a rate of 2.8 behaviors per 5-min (range 0 – 4) across this coaching phase. Overall, Ben demonstrated relatively higher rates of independent IAO (*M* =2.8 behaviors per 5-min) than prompted IAO (*M* = 0.2 per 5-min. During maintenance, Ben's prompted rates (*M*) were 1, 1, and 2 behaviors per 5 minutes for FPP, OS, and IAO, respectively. His independent rates (*M*) were 1.75, 0.25, and 0.25 behaviors per 5 minutes for FPP, OS, and IAO, respectively.

Ben's rates of social interactions in baseline condition (pre-intervention) and caregiver-implemented intervention with coaching condition (intervention) are displayed in Fig.10. In baseline, Ben engaged in a rate of 0.9 social interactions, on average; and in intervention, he engaged in a slightly higher rate (*M* = 1.18) of social interactions with his brother. In addition, as shown in Fig. 10, Ben engaged in some social pretend play during baseline sessions, with an average rate of 0.5 behaviors per 5 minutes. During intervention sessions, his rate of social pretend play increased to 0.76 behaviors per 5 minutes. Specifically, he started to engage in more social pretend play again after session 13 and mostly during the OS intervention and throughout IAO sessions. In the first maintenance session, Ben even used the modeling procedure once to show his brother a play idea. He said, "*Hey Sam, look at me. I am fixing the school bus (he modeled how to fix the bus). Your turn!*"

As reported by Ann (Ben's mom), Ben often engaged in many pretend play behaviors

and enjoyed it a lot. However, no effects were detected in all three of Ben's prompted and independent pretend play (i.e., FPP, OS, IAO) as well as his social interactions. One potential explanation could be that Ben usually had play themes in mind when playing (i.e., fire fighter theme), and usually spent longer time with a play action (including talking to Mom about his ideas or what's going to happen next etc.). Because pretend play behavior data was only collected on the number of pretend play behaviors demonstrated, Ben's extended engagement in one play theme/action was not reflected in the data. In addition, coding was paused only when the focal child (Sam) or the caregiver (Ann) was out of the screen. Ben; however, would leave the play area during some of the play sessions to get his toys or complete his play themes, which limited his play time. Also, when his brother left the play area, he tended to want to show the mom different pretend play actions he had. His pretend play behaviors during these times were not captured in the data because coding was paused. These issues will be addressed further in the discussion section.

James (Focal Child of Triad 2)

As presented in Fig.8, James displayed low and stable levels on his prompted and independent OS and IAO during baseline. He had a medium level for his prompted FPP (M = 8 behaviors per 5-min; range 7 – 10); and had a relatively high level for his independent FPP, with high variability (M = 15 behaviors per 5-min; range 8 – 19). James demonstrated considerably more independent FPP than prompted FPP in baseline. With the introduction of coaching targeting FPP, James's rate of prompted FPP initially decreased slightly, but remained at stable and similar levels as baseline. A downward trend was detected and began at session 12, after which his rate of prompted FPP had a decreasing trend, with a decreased level. His average rate of prompted FPP after coaching was 4.6 behaviors per 5-min (range 0 – 9). With independent

FPP, James's pattern of responding was variable. Initially, he demonstrated his highest rate of independent FPP during session 6 (19 behaviors per 5-min), and dropped in the next session, and quickly stabilized with minor variability, followed by a slight increasing trend until session 16. He did not engage in any independent for the next three sessions, after which his rate of independent FPP climbed to 7 behaviors per 5-min during the last intervention session. During this condition, he demonstrated an average of 8 independent FPP behaviors per 5-min (range 0 – 10.5) across the intervention sessions. Although James's rate of independent FPP decreased dramatically in level after coaching intervention started, he continuously engaged in more independent FPP (*M* = 8 behaviors per 5-min) than prompted FPP (*M* = 4.6 behaviors per 5-min).

James's rate of prompted and unprompted OS remained low and stable during baseline when the coaching commenced with FPP, with the exception of a small spike in session 7. With the introduction of coaching on the second targeted pretend play behavior, OS, his rate of prompted OS increased immediately, and quickly stabilized at levels relatively higher than baseline until session 15. Following session 16, his rate of prompted OS had a decrease in level, with minor variability. During this condition, his demonstrated an average rate of 1.7 behaviors per 5-min (range 0 – 4). His independent OS immediately increased during the first OS intervention session (session 11), where he demonstrated 3 independent OS behaviors per 5-min, followed by a slight decelerating trend for the remainder of intervention sessions. His average rate of independent OS after coaching commenced on OS was 1.6 behaviors per 5-min. It is notable that following session 13, James and his family was absent for 5 weeks (indicated by a dashed vertical line on Fig.8). This 5-week break did not result in decreasing of levels in both of his prompted and independent OS. Overall, during this condition, James engaged in similar rates

of prompted OS (*M* = 1.7 behaviors per 5-min) and independent OS (*M* = 1.6 behaviors per 5-min).

James's rates of prompted and independent IAO remained low during baseline when coaching was introduced on FPP or OS, with the exception of the last two baseline sessions (session 14 and 15). During the last two baseline sessions, a slight upward trend was detected. When coaching commenced with IAO, James's prompted IAO increased immediately in level, with an increasing trend, averaging 2.6 behaviors per 5-min for the remainder of intervention, with some variability. James's rate of independent IAO did not increase until after the second IAO intervention session. During session 17, his rate of independent IAO increased to 1 behavior per 5-min, followed by a slight upward trend until session 19, averaging 1.4 behaviors per 5-min (range 0 – 3) across this intervention phase. Overall, James's rate of prompted IAO (*M* = 2.6 behaviors per 5-min) was higher than that of independent (*M* = 1.4 behaviors per 5-min). Due to changing of family schedules and the start of the new school year, maintenance data was not collected for James.

James's rates of social interactions in baseline condition (pre-intervention) and caregiver-implemented intervention with coaching condition (intervention) are displayed in Fig.10. As shown in Fig.10, James engaged in a rate of 4.8 social interactions per 5-min with his sister during baseline sessions, on average; however, during intervention sessions, he engaged in less social interactions, with an average rate of 2.13 social interactions per 5 minutes. In addition, as shown in Fig.12, James engaged in some social pretend play during baselines sessions, with an average rate of 3.8 behaviors per 5 minutes. During intervention sessions, his rate of social pretend play decreased to 1.27 behaviors per 5 minutes. His social pretend play behaviors (in rate per 5-min) was variable both during baseline (range 1 – 9 behaviors per 5-min) and intervention.

This might be because the caregiver (Lea) engaged in more teaching of pretend play to James when coaching intervention started, which in turn took up some of the sibling play time. This issue will be further addressed in the discussion section.

Although no effects were detected in all three of James's prompted and independent pretend play behaviors (i.e., FPP, OS, IAO), as presented in Fig.14, during caregiver-implemented intervention with coaching condition (intervention), he demonstrated a total of 30 novel independent pretend play behaviors (new behaviors that were not present during baseline sessions) after coaching commenced in session 6. As shown in Fig.7, James's independent FPP behaviors decreased substantially during the second FPP intervention session (session 8) and remained at a considerably lower level than baseline. However, cumulative records in Fig.14 indicated that James consistently demonstrated an average of 2 novel independent pretend play behaviors for 12 of the 20 intervention sessions.

Mia (Sibling of Triad 2)

As shown in Fig.9, Mia displayed low and stable levels for her prompted and independent OS and IAO during baseline. She engaged in some prompted FPP consistently in each baseline session (M = 3.8 behaviors per 5-min; range 2 – 5). Her independent FPP was at a relatively high level, with high (M = 11.8 behaviors per 5-min; range 4 – 20). Mia demonstrated considerably more independent FPP than prompted FPP in baseline. With the introduction of coaching targeting FPP, Mia's rate of prompted FPP initially decreased slightly, following by an increasing trend until session 10. A downward and variable trend started at session 11, after which her rate of prompted FPP had a decreased level. Her average rate of prompted FPP following coaching was 2 behaviors per 5-min (range 0 – 5). Mia's level of independent FPP was decreasing and variable. Her rate of independent FPP initially decreased during session 6 (10

behaviors per 5-min), and dropped again in the next session, after which her rate of independent FPP stabilized with minor variability until session 18. She did not engage in any independent FPP during the last two sessions (session 19 and 20). During this condition, she demonstrated an average of 3.2 independent FPP behaviors per 5-min (range 0 – 10) across the intervention sessions. Although Mia's rate of independent FPP decreased dramatically in level after coaching intervention, she continuously engaged in more independent FPP (*M* = 3.2 behaviors per 5-min) than prompted FPP (*M* = 2 behaviors per 5-min).

Mia's rate of prompted and unprompted OS remained low and stable during baseline when the coaching commenced with FPP. With the introduction of coaching on the second targeted pretend play behavior, OS, Mia's rate of prompted OS increased in level, with an increasing trend until session 13. She did not engage in any prompted OS for the last five intervention sessions. Her average rate of prompted OS during this condition is 0.9 behaviors per 5-min (range 0 – 3). Mia's rate of independent OS initially increased during session 11, where she demonstrated a rate of 5 independent OF behaviors per 5-min. Her rate of independent OS decreased dramatically in the next session, followed by a decreasing trend, with a decrease in level. She did not engage in any independent OS for the last five intervention sessions. The average rate of independent OS during this condition is 0.8 behaviors per 5-min (range 0 – 5). It is notable that following session 13, Mia and her family were absent for 5 weeks (indicated by a dashed vertical line on Fig.8). Upon return (session 14), slight decrease in levels were detected in Mia's prompted and independent OS. Overall, during this condition, Mia engaged in similar rates of prompted OS (*M* = 0.8 behaviors per 5-min) and independent OS (*M* = 0.9 behaviors per 5-min).

Mia's rate of prompted and independent IAO remained low during baseline when

coaching was introduced on FPP or OS, with the exception of sessions 13 and 14. During these two baseline sessions, a slight increase in level in her independent IAO was detected. When coaching was introduced with IAO, Mia's prompted and independent IAO remained low, with minor variability over the remaining intervention sessions (M = 0.2 per 5-min; range 0 – 1). This pattern was replicated in her independent IAO (M = 0.2 per 5-min; range 0 – 1). Due to changing of family schedules and the start of the new school year, maintenance data was not collected for Mia.

Mia's rates of social interactions in baseline condition (pre-intervention) and caregiver-implemented intervention with coaching condition (intervention) are displayed in Fig.10. As shown in Fig.10, Mia engaged in a rate of 10.4 social interactions per 5-min with her brother during baseline sessions, on average; however, during intervention sessions, she engaged in a substantially fewer social interactions than baseline, with an average rate of 4.87 social interactions per 5 minutes. Furthermore, as shown in Fig.12, Mia engaged in a considerably higher rate of social pretend play during baselines sessions, averaging 7.2 behaviors per 5 minutes. During intervention sessions, her rate of social pretend play decreased to 3 behaviors per 5 minutes. She engaged in social pretend play with her brother for 18 of the 20 intervention sessions. This might be because the caregiver (Lea) engaged in more teaching of pretend play to James when coaching intervention started, which in turn took up some of the sibling play time. Mia seemed to enjoy the play sessions a lot and was constantly laughing throughout the sessions. However, likely due to the age gap between siblings, Mia did not play with the toys a lot. In most cases, Mia helped her mom by getting toys, as well as providing praise to James. Mia also engaged in assigning absent attributes (AAA) throughout the play sessions, which was not reflected in the data. These issues will be further addressed in the discussion section.

Social Validity

All caregiver participants completed the survey about the multi-component coaching package online anonymously. Table 4 shows the quantitative results from the social validity survey. Overall, caregivers expressed strong satisfaction towards the multi-component coaching package. They found the coaching package useful in building their confidence and improving their understanding in the use the modeling procedure with different pretend play skills. They also expressed strong interests in continuing using the strategies taught around pretend play with their children. Both of the caregivers shared that they would recommend this type of coaching to other families because of its accessibility and usefulness ("*Very simple to learn and implement the technique and is effective" and " It gives you the tools to help your child expand their pretend play skills which eventually helps with kids' socialization and making friends"*). They also mentioned noticing clear changes in their child's pretend play and social interaction skills; one shared, "*Tolerated better turn taking and waiting for his turn. Initiated pretend play activities without being prompted and used his imaginative pretend play skills much more. Overall, I think the study has helped him to expand his pretend play skills."*; another caregiver shared, " *I am so happy to note that my son on the spectrum is now independently doing simple pretend play actions like feeding baby, washing hands at sink, using a soap to give baby a bath. He is sitting with the older brother and watching him play. He also verbally invites me to play with the kitchen set, baby and stuffed animals*." Caregivers also mentioned seeing their child engaging in pretend play with other people (i.e., family members, children, teachers) in different settings; one shared, "*He has been playing rescue vehicles where he would save an imaginary patient. He has played with his sister, best friend and BCBA*."; another shared, "*My son pretends to feed the baby and pretends that there is a fire when playing with dad and grandfather. He*

gives imaginary fruit and gets imaginary money when playing with dad." Both caregivers emphasized that they enjoyed this project and both them and the children had great fun playing together. It is important to note that although the caregivers completed the survey anonymously, only two caregivers were involved in this study, which could limit the anonymity of the survey and introduce potential bias.

Chapter Five: Discussion

The purpose of the present study was to evaluate the effects of using a multi-component coaching package (i.e., virtual trainings, email performance feedback) to coach caregivers in implementing the modeling procedure with fidelity, to teach pretend play to their young children. Child behavior data on pretend play behaviors and social interactions were measured as secondary, non-experimental variables. Visual analysis suggested a functional relation between the multi-component coaching package and caregivers' fidelity to the modeling procedure on three targeted pretend play behaviors (i.e., FPP, OS, IAO). Both Ann (caregiver of triad 1) and Lea (caregiver of triad 2) demonstrated an immediate increase in their modeling procedure fidelity on all three pretend play behaviors, with the exception of Lea's fidelity on FPP. While a functional relation was observed for caregivers' fidelity to the modeling procedure, their rates of modeling trials on FPP were lower during coaching condition than in baseline. Maintenance data were limited, and it was only conducted with Ann and her children due to changing of family schedules and start of new school year. Ann's fidelity to the modeling procedure on all three targeted types of pretend play maintained at high levels, remaining well above baseline levels during maintenance sessions. However, the child data were inconclusive and did not support the hypothesis that caregivers' use of the modeling procedure with fidelity would increase children's pretend play behaviors. This study extends previous pretend play

literature in several ways, which are discussed in the subsequent sections.

Caregiver Remote Coaching Focusing on Pretend Play

Results suggest that caregivers can learn to implement an intensive multi-step teaching procedure with fidelity to teach different types of pretend play to their children in home settings. A burgeoning body of research has shown that caregivers of young children with disabilities can be trained to use effective strategies for supporting their children on language, communication, imitation skills, and challenging behaviors disabilities (e.g., Brown & Woods, 2015; Fettig et al., 2015; Gerow et al., 2021; Ingersoll & Gergans, 2007; Kaiser & Roberts, 2013). No studies to date have taught caregivers to use multi-step teaching procedure to teach pretend play to their children. Although previous pretend play research provides strong evidence on the effectiveness of adult modeling and prompting procedures (i.e., video modeling, response prompting procedures) on increasing children's pretend play, coaching around pretend play has only been provided to in-service and pre-service teachers in early childhood settings (Barton & Wolery, 2010; Barton et al., 2013; Gomez et al., 2021; Macdonald et al., 2005; Saral & Ulke-Kurkcuoglu, 2020). Caregivers of young children with disabilities are rarely involved in interventions and coaching with a focus on supporting their children's play development. The importance of play in young children's multiple developmental domains has not only been stressed in research (Jung & Sainato, 2013; Lifter et al., 2011; Lory et al., 2018), but also acknowledged as a critical milestone by national organizations such as NAEYC. Young children with disabilities often have play-related IEP goals; as a result, coaching caregivers to provide opportunities for their children to learn pretend play skills at home is especially important. The success of using the multi-component coaching package contributes to the research on caregiver coaching around play.

The results of this study also extend the research on coaching caregivers remotely.

Remote coaching is an emerging form of caregiver coaching. It provides a more flexible way for caregivers to actively participate in coaching while receiving real-time as well as asynchronous feedback. An emerging body of literature has demonstrated promising effects of delivering caregiver-implemented interventions through technology-based, remote caregiver coaching models (e.g., Chung et al., 2020; Douglas et al., 2018; Duffice et al., 2013; Meadan et al., 2016; Suess et al., 2014; Wainer & Ingersoll, 2012; Gerow et al., 2021; Quinn et al., 2021). For example, Quinn et al. (2021) coached caregivers on their use of enhanced milieu teaching (EMT) strategies to promote children's language and communication skills through a hybrid telehealth delivery model (i.e., in-person workshops, a mix of in-person and telepractice coaching sessions). Caregivers' use of the EMT strategies increased as a result of coaching; and children's communication skills also increased slightly with variability.

However, recent literature on technology-based, remote caregiver coaching models focuses mainly on providing real-time or in-vivo coaching and performance feedback (Simacek et al., 2020). In early childhood classroom settings, researchers have found that email can be an effective and efficient method for delivering performance feedback to teachers (Artman-Meeker & Hemmeter, 2013; Barton et al., 2018; Gomez et al., 2021; Hemmeter et al., 2011; McLeod et al., 2019; O'Flaherty et al., 2019). The high cost of technology and stable internet may create some barriers for caregivers to receive coaching. Email provides high-quality, low-cost coaching support that can be accessed at any time. This is the first study to use email to deliver performance feedback to caregivers as the coaching strategy. This study adds to the current body of remote caregiver coaching literature by demonstrating the effects of a combination of virtual trainings and email performance feedback to caregivers, to support children's play at home.

Caregiver's Fidelity to the Modeling Procedure

Although the overall outcomes of the study were positive for the caregivers, there was variability in outcomes across behaviors and caregiver-child-sibling triads. First, caregivers differed somewhat in their percentage fidelity to the modeling procedure. Ann's percentage fidelity to the modeling procedure was 66.15%, 82.41%, and 79.96% on FPP, OS and IOA, respectively; and Lea's fidelity was 48.70%, 60.68%, and 61.10% on FPP, OS and IOA, respectively. Even though the caregivers' fidelity increased dramatically from baseline, and a functional relation was detected, their fidelity on FPP was lower than the other behaviors. This finding is interesting because the caregivers received the longest period of time on coaching for FPP. Although not reflected in the caregiver behavior data (Fig.2 and Fig.3), it was noted that when coaching commenced with OS or IAO, both caregivers began using less intensive types of prompts (i.e., verbal prompt) when modeling FPP behaviors. It is possible that the caregivers noticed improvements in their children's FPP. Therefore, they automatically moved on to using less intrusive prompts. This resulted in step (b) "model one pretend play behavior" being often coded as incorrect, which brought down the overall FPP fidelity. In fact, issues around prompt dependence when teaching pretend play to children with disabilities have been highlighted in several studies (Goldstein & Cisar, 1992; Zercher et al., 2001). To ensure caregivers use the appropriate prompt fading procedures, more systematic planning and teaching may be needed to optimize positive child outcomes.

While data indicated that the caregivers increased their percentage fidelity to the modeling procedure on all three behaviors immediately following trainings and email performance feedback, both caregivers' fidelity to the modeling procedure averaged medium or medium-high levels across behaviors (M = 66.50%; range = 48.70 -82.41%,). In particular, the caregivers reached high fidelity of 80-100% for all three pretend play behaviors at one point

(with the exception of Lea's fidelity on FPP), but the high fidelity did not maintain across sessions. Although previous research has shown that high treatment fidelity is associated with positive child outcomes, no functional relation between children's pretend play and caregiver fidelity was detected despite the overall higher fidelity Ann demonstrated. This finding contradicts previous research on coaching caregivers with fidelity to support their children's learning. There are several potential explanations for this finding.

First, it is important to acknowledge that the current study was conducted remotely during the COVID-19 pandemic. The COVID-19 pandemic not only shifted service delivery model for early childhood special education from in-person to remote, it also relied more on caregivers to implement targeted learning goals to their children with disabilities (Steed et al., 2021). Steed et al. (2021) pointed out the stress families might be under to teach their children on top of caring for their health and wellbeing. To provide more flexibility as families navigate through busy schedules, coaching activities for this study only included three virtual trainings and feedback via email. Although the effects of performance feedback following brief trainings have been well established, it is important to note that the implementers in most of the studies were professionals (i.e., pre- and in-service teachers, paraprofessionals), who had formal educational trainings and had experiences providing services to children with disabilities. Caregiver participants in this study did not have education backgrounds or experiences working in preschool classrooms. Particularly, they may not have been trained to use a relatively complicated teaching procedure to teach pretend play. It is possible that more intensive or in-vivo coaching (i.e., bug-in-ear coaching) in the initial coaching sessions may be needed to ensure that caregivers can use the teaching procedure with high fidelity (i.e., 80% fidelity) to build caregiver's confidence and competence as well as maximize positive child outcomes.

Second, the present study was adapted from a classroom-based intervention using response prompting procedures to teach pretend play (e.g., Barton & Wolery, 2010; Barton et al., 2013; Barton, 2015; Barton, Gossett, et al., 2019; Qiu et al. 2019). It is likely that the "active ingredients" to change child pretend play behaviors in classroom settings are different from home-settings, especially with the nature of caregiver-child relationships and the involvement of siblings in play. For example, there may be certain steps that are not necessary or missing that may help promote child pretend play. To understand which components of an intervention that are the active ingredients associated with behavior change (Abry et al., 2015; Brown & Woods, 2016), more advanced analysis, such as sequential analysis, is needed. For instance, Brown and Woods (2016) conducted a series of sequential analyses to identify what coaching and intervention behaviors/strategies are more likely to lead to target behaviors. The sequential analyses revealed that children's demonstration of communication skills was contingent on their parents' implementation of a specific intervention strategy. Specifically, they found that child improvements in communication skill is highly associated with parents' use of responsive interaction strategies (i.e., contingent imitation, mapping, verbal expansions). Investigating differential impacts of components of intervention strategies on child outcomes is a valuable next step. For example, in the current study, the caregivers used a multi-step modeling procedure to teach pretend play. With the modest effects on child pretend play behaviors, the use of sequential analysis could help identify which component of the modeling procedure have a higher likelihood of resulting in changes in child pretend play behaviors. This will help shape play interventions, specifically on incorporating key components that are needed for effective changes in child outcome.

Rates of Modeling Trials Provided by Caregivers

In addition to measuring caregivers' percentage fidelity to the modeling procedure, data were also collected for caregivers' rates of modeling trial provided. As presented in Fig.2 and Fig.3, across coaching sessions, Ann's average rates of modeling trials on FPP, OS, and IAO were as follows: 5.01 trials/5-min, 3.2 trails/5-min, and 3.4 trials/5-min. Lea's average rates of modeling trials on FPP, OS, and IAO across coaching sessions were as follows: 8.27 trials/5-min, 3.4 trails/5-min, and 4.8 trials/5-min. In 28 out of 30 sessions (93%), the caregivers provided modeling trials both on the targeted type of pretend play and the targeted pretend play taught in the previous tier (s). This indicated that child participants were provided with multiple opportunities to practice each type of pretend play throughout the intervention.

Both caregivers initiated high rates of modeling trials on FPP in baseline. This might be a result of observer effect. Despite the high rates of FPP modeling trials, Ann and Lea had low fidelity to the modeling procedure for FPP in baseline. When taken together, caregivers' fidelity was congruent with their rates of modeling trials. Specifically, it seems like higher modeling procedure fidelity is associated with lower rates of modeling trials. As presented in data, Ann had the highest fidelity on FPP (session 11) when she provided 1.5 modeling trials/per 5-min; highest fidelity on OS (session 14) when she provided 2.5 trials/per 5-min; and the highest fidelity on IAO (session 20) when she provided 2.5 trials/per 5-min. Similar patterns were also detected in Lea's behavior. Lea had the highest fidelity on OS (session 18) when she provided 1 trial/per 5-min; and the highest fidelity on IAO (session 17) when she provided 1 trial/per 5-min. It is not surprising that when caregivers spent more time in each trial to ensure that modeling procedure steps were accurately followed, they initiated fewer modeling trials for the session. This will be an important factor to consider when examining and determining the dosage of intervention needed for effectively promoting child outcomes.

Furthermore, Ann and Lea provided fewer modeling trials across behaviors than baseline, despite the immediate increase on modeling trials initiated on two pretend play behaviors individually (i.e., OS, IOA). In particular, during coaching, Ann engaged in a total of 8.2 model trials/per 5-min per session (baseline rate = 12 trials/per 5-min), and Lea engaged in a total of 12.33 model trials/per 5-min per session (baseline rate = 17.6 trials/per 5-min). This finding is not consistent with previous coaching literature that also measured rates of specific interventions or teaching strategies provided by caregivers (Brown and Woods, 2015; Quinn et al., 2021; Windsor et al., 2019). It is also important to note that no effects were detected in the focal children's pretend play behaviors. This suggests that, perhaps, a frequency threshold of prompting trials needs to be met, to ensure meaningful changes in child behaviors. The dosage of prompting trials needed remains unclear in pretend play literature (Barton & Wolery, 2010). Therefore, evaluating the dosage of intervention trials should be addressed in future research.

Effects of Caregiver Coaching on Child Pretend Play and Social Interactions

Despite clear changes in the pretend play behaviors of the focal children as reported by both caregivers through the social validity survey, the effects on increases in child pretend play behaviors were modest, and no functional relations existed between caregivers' use of the modeling procedure with fidelity and children's pretend play. This finding was not consistent with previous pretend play literature and did not support the hypothesis that caregiver's use of adult prompting and modeling procedure would change the frequency of children's pretend play behaviors. Additionally, this study examined the involvement of siblings in play interventions. The effects on children's social interactions were mixed. These findings required some discussion.

Children's Pretend Play Behaviors

There are several possible explanations for the outcomes in child pretend play. First, as highlighted in the previous section, even though both caregivers demonstrated considerably higher fidelity to the modeling procedure at intervention than baseline, their fidelity on all three targeted pretend play were only at medium-high levels, averaging about 65% fidelity across participants and behaviors (range = 48.70 - 82.41%). Quinn et al. (2021) examined four caregivers' implementation of five EMT language support strategies, specifically on their correct use and frequency of EMT strategies. Results showed that all caregivers demonstrated high fidelity on almost all of the targeted EMT strategies, with an average at or above 80% fidelity. Child data also revealed increases in child targeted communication skills, with variability. In a study conducted by Gerow et al. (2021) focusing on coaching three caregivers to improve daily living skills of children with ASD, caregivers' correct implementation of targeted strategies/skills was measured. A mastery criterion of 80% fidelity were established for caregivers during coaching sessions. Overall, caregivers achieved mastery criterion for 7 of the 12 targeted skills. Two of the three caregivers who demonstrated high implementation fidelity (i.e., at least 80%) across behaviors yielded increases in their children's daily living skills. The promising results on child behavior from these two studies suggest that 65% of fidelity is not enough for contributing to meaningful changes in child behavior. It is possible that at least 80% implementation fidelity to teaching strategies is necessary to demonstrate effects in child behavior.

Furthermore, in the present study, caregiver data (i.e., percentage fidelity to the modeling procedure) served as the primary dependent variable (DV) and was used to make decisions for changing tiers. Unholz-Bowden et al. (2020) conducted a systematic review on research pertaining to training caregivers in implementing behavioral procedures via telehealth. Among

the 30 studies included, the authors found that only 7 (23%) studies used behavior exhibited by caregivers as the only focus of dependent variables. No child outcome data was reported for these 7 studies, which limited the interpretation of the effectiveness of the studies. Since no studies to date have investigated the effects of caregiver coaching on children's pretend play behaviors, it may be important to examine how previous pretend play research, with a focus on coaching preschool teachers (e.g., Barton & Wolery, 2010; Barton et al., 2013; Barton 2015) were conducted, including how experimental decisions were made. In fact, in all three pretend play coaching studies, the primary dependent variable was child behavior. Phase changing criteria was met when child participants demonstrated more independent pretend play than prompted pretend play for three consecutive sessions. Increases in children's independent pretend play were detected in all three studies. Because of the design of the present study, coaching commenced with subsequent tier(s) when a clear and stable increased level in caregiver's percentage fidelity to the modeling procedure was detected. Across both caregiver participants and all tiers (pretend play behaviors), new targeted pretend play behavior was always introduced following 5 coaching sessions in the previous tier. In Barton and Wolery (2010), on average, it took 11 sessions for a child to move on to the second tier; 8 sessions to move on to the third tier; and they remained in the third tier for 6.75 sessions. Similarly, in Barton (2015), on average, child participants remained in the first tier for 11.75 sessions; the second tier for 13.5 sessions; and the third tier for 10.25 before meeting the criteria to move on to subsequent tier(s). In these two studies, the number of intervention sessions that children received were almost twice the number of the current study.

These findings imply that for children with ASD to consistently engage in higher levels

of independent pretend play, perhaps, more intervention sessions are needed. Also, the selection of the primary dependent variable that is used to make decisions for intervening with subsequent tier(s) may be an important factor to take into account if the ultimate goal of coaching is to have long-term behavior change in child's play. This could shed some light on the design of future studies.

Diversity of Pretend Play Behaviors. Although no functional relation was detected between caregivers' modeling procedure fidelity and focal children's pretend play behaviors, some modest, but variable increases in pretend play were detected in both Sam (focal child of triad 1) and James (focal child of triad 2). First, Sam engaged in low rates of independent pretend play on all three targeted behaviors in baseline. During intervention, his rate of independent FPP was slightly higher than his prompted FPP. His rates of independent OS and IAO also increased but were at levels lower than prompted OS and IAO during intervention. James, on the other hand, engaged in a high rate of independent FPP and low rates of independent OS and IAO in baseline. During intervention, his rate of independent FPP remained at higher levels than prompted FPP. His rates of independent OS and IAO also increased but were at levels lower than prompted OS and IAO during intervention. Research has consistently found that children with disabilities often have less variety in their play and demonstrate fewer spontaneous pretend play behaviors (Barton, 2015; Jarrold, 2003; Kasari et al., 2013; Lifter et al., 2011). This speaks to the importance of examining the effects on pretend play interventions on expanding children's play diversity.

To understand the focal children's diversity of pretend play at pre- and intervention, cumulative data on children's use of novel independent pretend play behaviors were graphed and presented in Fig.13 and Fig.14. As presented in Fig.13, Sam demonstrated an average of 1 novel

independent pretend play behavior during intervention sessions, accumulating a total of 15 novel behaviors. Similarly, as presented in Fig.14, James demonstrated an average of 2 novel independent pretend play during intervention sessions, accumulating a total of 30 novel behaviors. As mentioned earlier, James engaged in a relatively high rate of independent FPP in baseline; however, anecdotally, most of them were repetitive pretend play behaviors (i.e., cook food in the microwave; put fruits in the blender to make juice). With the introduction of coaching intervention, in spite of his decreased level of FPP which was noteworthy, cumulative data indicated that James displayed different independent pretend play behaviors consistently throughout intervention sessions. Findings in the diversity of pretend play provide promising preliminary evidence to the effectiveness of the current study on expanding the play repertoire of children with disabilities.

In addition, when examining the play diversity in each targeted type of pretend play, Sam and James demonstrated more novel independent FPP and OS than IAO. Specifically, among the 15 novel independent pretend play behaviors in which Sam engaged, 9 are FPP; 5 are OS and 2 are IAO. Among the 30 novel independent pretend play behaviors in which James engaged, 12 are FPP; 10 are OS; 6 are IAO; and 2 are AAA. This was consistent with previous pretend play research reporting data on child's play diversity (Barton & Wolery, 2010; Barton 2015; Saral & Ulke-Kurkcuoglu, 2020). This is an interesting finding which could inform future research in re-conceptualizing pretend play interventions, specifically, a prerequisite skill may be needed, to serve as a stepping stone for the successful acquisition of more sophisticated play skills.

Social Interactions between Siblings

This study also extends previous research by involving siblings in pretend play

interventions, measuring and reporting changes in child participants' social interactions. Only two studies (Celiberi & Harris, 1993; Coe et al., 1991) involved siblings in play interventions; however, no data on social skills were reported. In the social validity survey, caregiver participants were asked to indicate whether they noticed changes in their child with ASD's interactions with the sibling. Both caregivers responded positive to this question. One caregiver shared that her son (the focal child) seemed to show more interests in his brother (the sibling)'s play (i.e., the focal child would sit with his brother and watch him play). The other caregiver also shared that her child had been playing "rescue mission" where he saved imaginary friends with the sibling. The caregiver also thought that her child seemed to better understand the concept of sharing and turn taking when playing with their sibling.

Despite clear changes in focal children's social interactions with their siblings as reported by the caregivers, data on child participants' demonstration of social interactions at pre-and intervention showed mixed effects. As shown in Fig.10, during intervention, both Sam and Ben (children of triad 1) engaged in slightly more social interactions; while James and Mia (children of triad 2) engaged in considerably fewer social interactions. This pattern was also detected in the rates of social pretend play. That is, during intervention, Sam and Ben's rates of social pretend play increased slightly; while James and Mia's rates of social pretend play decreased. There are several potential explanations for this outcome.

As reported by Lea (caregiver of triad 2), sharing and turn-taking skills were difficult for James, and when it came to the sharing of preferred toys, James often engaged in challenging behaviors. In particular, during session 11 and session 12, Lea paused and resumed video recording in the middle of play sessions, as suggested by research protocol. Before session 13, the researcher had a zoom meeting with Lea to brainstorm potential solutions. Also, the difficulty

around sharing seemed to occur more often during intervention when Lea (the caregiver) started to model pretend play actions using James's preferred toys as well as asking James to take turns with his sister to ensure that both children had a turn. As described in the *Response Definitions and Data Collection Section*, social interactions were defined as any positive verbal, or nonverbal initiations or response directed toward a sibling (See Table 2 for more detailed information). Only social initiations and responses that were neutral or positive in natural were counted toward social interactions. It is possible that the difficulties around sharing during intervention limited the number of times James and Mia engaged in positive social interactions with each other.

An alternative explanation is that perhaps, the relatively high rates of modeling trials limited the opportunities for the children to interact. The inconsistency between caregiver reports of child social interactions and child video observation data was interesting and opens areas for future inquiry. It implies that issues with the measurement system in the present study resulted in changes in children's social interactions not being reflected correctly. Considering the unique role siblings play in the lives of young children with disabilities (MaHale et al., 2016; Spector & Charlop, 2018), it is worthwhile to further investigate measurement systems that can accurately capture children's changes in social interaction skills over time. This will provide valuable insight into understanding the quality of sibling social interactions and identifying the critical variables for promoting positive sibling relationships.

Limitations of the Study

There were three major limitations in this study. The first limitation of this study was the lack of maintenance data. Due to time constraints, maintenance was only collected for triad 1 and only two data points were collected. No maintenance data was collected for triad 2. Caregiver

behavior data indicated that Ann was able to maintain high levels of fidelity to the modeling procedure on all three pretend play behaviors even at 9 weeks after intervention ended. However, the low number of data points limits the interpretation of the effectiveness of the coaching intervention. Future research should assess the extent to which caregivers continue to implement the intervention correctly following periods of time without coaching.

Second, there is a risk of performance bias and detection bias because the coach (the researcher) was the primary data collector and made decisions on condition changes. In single-case research, performance bias is difficult to minimize due to the frequent contact between the researcher and participants (Reichow et al., 2018). To minimize detection bias, the researcher applied a blinding procedure to ensure that video files for secondary data coding did not indicate the condition. The secondary coder; however, was not blind for condition change from baseline to coaching, which might introduce measurement bias.

The third limitation of this study was the measurement issues around pretend play. Measurement issues such as inconsistency in definitions of pretend play have been continuously identified in pretend play literature (Barton, 2010; Thompson & Goldstein, 2019; Weisberg, 2015). Such measurement issues limit researchers' ability to identify valid and reliable measures of pretend play. In particular, in this study, to maximize the usage of videos and minimize the likelihood of caregivers needing to record play sessions again, research procedure specifically stated that coaching should only be paused when the focal child or the caregiver was out of the screen. This may have contributed to siblings' pretend play behaviors not being accurately captured through the measurement system. For instance, Ben (sibling of triad 1) usually engaged in high and sophisticated levels of pretend play behaviors, as reported by Ann. Ben tended to leave the play area to get toys or complete his play themes. Per coding rule, his pretend play

behaviors during these times were not captured. This, in part, explains why his rates of independent pretend play were low in some sessions. In addition, frequency count was used to measure children's behavior changes in pretend play. While the number of pretend play behaviors demonstrated by a child is widely used in pretend play literature and may be the appropriate way to measure changes in child behavior, quantifying a child's engagement in play (e.g., how long a child spends time engaging in a specific play theme) may be equally important in understanding children's play repertoire. Therefore, future research should examine different measurement systems that contribute to the most accurate reflection of child's changes in pretend play behaviors. This will potentially inform effective strategies for supporting the play skills of young children with disabilities in future research.

Implications for Research and Practice

This study highlights several important implications for research and practice. First, remote coaching is an effective and efficient avenue for providing sustained caregiver training and coaching. In the current study, all interactions between the researcher and caregivers occurred remotely; and three brief caregiver trainings and ongoing follow up support was provided via email. Both caregiver participants expressed strong interests in participating in this type of caregiver coaching in the future and would definitely recommend it to other caregivers. One caregiver further shared, "*It gives you the tools to help your child expand their pretend play skills which eventually helps with kids socialization and making friends*." Another caregiver shared, "*Very simple to learn and implement the technique. The feedback and tips provided by the coach is extremely useful. My child has shown a lot of improvement after participation in this project.*" Reponses from the caregivers speak to the three critical dimensions of social validity: goals, procedures, and outcome (Gast & Ledford, 2018). To my knowledge, this is the first study

to date to teach caregivers to implement an intensive, multi-step procedure with fidelity to engage in pretend play with their children. The multi-component coaching package used in this study was acceptable and effective to caregivers. As remote delivery of services and remote coaching models are emerging, this study sheds light on ways to support caregivers of children with disabilities, that are accessible, low cost and easy to use. However, the results of this study should be interpreted with caution, due to the lack of effect on child behavior.

Additionally, as highlighted in Steed et al. (2021), teachers rarely receive training in remote caregiver coaching, which potentially decreases the quality of services children received. Remote coaching can, however, provide opportunities for building positive professional-family relationships, which is key to promoting the use of family-centered approaches in supporting children's learning. As young children spend a significant amount of time with their caregivers, and play provides natural opportunities for positive caregiver-child relationships, it is important for practitioners to explore professional development opportunities focusing on coaching caregivers remotely around play.

Furthermore, the researcher had not set criterion for fidelity to the modeling procedure or for the number of modeling trials that caregivers should be providing. Caregivers in this study had mixed rates of modeling trials provided for each targeted type of pretend play. In particular, Ann engaged in higher levels of percentage fidelity to the modeling procedure on all three behaviors than Lea, on average; while Lea provided higher rates of modeling trials across three behaviors than Ann. Since none of the children showed significant improvements in pretend play behaviors, future research should examine the rates of modeling trials that are feasible, as well as the rates of modeling trials and fidelity to the modeling procedure that are needed to promote meaningful changes in child play behaviors. It will also provide significant value to the field if

future research examines the "active ingredients" in an intervention or teaching procedure that are associated positive child outcomes to better refine play interventions.

Finally, despite caregivers' reports of improvements in their children's pretend play and social interactions, only a modest and variable effect on child social interaction skills was detected in triad 1. This implies that there may be issues around measuring progress in both pretend play and social interaction skills. Examining constructs in pretend play and social interaction skills to develop measurement systems that can more precisely reflect a child's level of pretend play as well as quantify changes in parent-child or child-sibling relationships will be critical in future research.

References

Abry, T., Hulleman, C. S., & Rimm-Kaufman, S. E. (2015). Using indices of fidelity to intervention core components to identify program active ingredients. *American Journal of Evaluation*, *36*(3), 320-338. https://doi.org/10.1177/1098214014557009

Akemoglu, Y., Muharib, R., & Meadan, H. (2020). A systematic and quality review of parent-implemented language and communication interventions conducted via telepractice. *Journal of Behavioral Education*, 1-35. https://doi.org/10.1007/s10864-019-09356-3

Artman-Meeker, K., Fettig, A., Barton, E. E., Penney, A., & Zeng, S. (2015). Applying an evidence-based framework to the early childhood coaching literature. *Topics in Early Childhood Special Education*, *35*(3), 183-196. https://doi.org/10.1177/0271121415595550

Artman-Meeker, K.M., & Hemmeter, M.L. (2013). Effects of training and feedback on teachers'

use of classroom preventive practices. *Topics in Early Childhood Special Education, 33*(2), 112-123. https://doi.org/10.1177/0271121412447115

Baker, M. J. (2000). Incorporating the thematic ritualistic behaviors of children with autism into games: Increasing social play interactions with siblings. *Journal of Positive Behavior Interventions*, *2*(2), 66-84. https://doi.org/10.1177/109830070000200201

Barton, E. E. (2014). Assessing social competence and play skills. In M.E. McLean, M.L. Hemmeter & P. Snyder (Eds.), *Essential elements for assessing infants and preschoolers with special need* (pp. 196-241), Pearson.

Barton, E. E. (2016). Critical issues and promising practices for teaching play to young children with disabilities. In B. Reichow, B.A. Boyd, E.E. Barton, & S.L. Odom (Eds.), *Handbook of early childhood special education* (pp. 267-286). Springer. https://doi.org/10.1007/978-3-319-28492-7_15

Barton, E. E. (2010). Development of a taxonomy of pretend play for children with disabilities. *Infants & Young Children, 23*(4), 247-261.

Barton, E. E. (2015). Teaching generalized pretend play and related behaviors to young children with disabilities. *Exceptional Children*, *81*(4), 489-506. https://doi.org/10.1177/0014402914563694

Barton, E. E., Chen, C. I., Pribble, L., Pomes, M., & Kim, Y. A. (2013). Coaching preservice teachers to teach play skills to children with disabilities. *Teacher Education and Special Education*, *36*(4), 330-349. https://doi.org/10.1177/0888406413505113

Barton, E. E., Choi, G., & Mauldin, E. G. (2019). Teaching sequences of pretend play to children with disabilities. *Journal of Early Intervention*, *41*(1), 13-29. https://doi.org/10.1177/1053815118799466

Barton, E. E., & Fettig, A. (2013). Parent-implemented interventions for young children with disabilities: A review of fidelity features. *Journal of Early Intervention*, *35*(2), 194-219. https://doi.org/10.1177/1053815113504625

Barton, E. E., Gossett, S., Waters, M. C., Murray, R., & Francis, R. (2019). Increasing play complexity in a young child with autism. *Focus on Autism and Other Developmental Disabilities*, *34*(2), 81-90. https://doi.org/10.1177/1088357618800493

Barton, E. E., Pokorski, E. A., Gossett, S., Sweeney, E., Qiu, J., & Choi, G. (2018). The use of email to coach early childhood teachers. *Journal of Early Intervention*, *40*(3), 212-228. https://doi.org/10.1177/1053815118760314

Barton, E. E., & Smith, B. J. (2015). Advancing high-quality preschool inclusion: A discussion and recommendations for the field. *Topics in Early Childhood Special Education*, *35*(2), 69-78. https://doi.org/10.1177/0271121415583048

Barton, E. E., & Wolery, M. (2008). Teaching pretend play to children with disabilities: A review of the literature. *Topics in Early Childhood Special Education*, *28*(2), 109-125. https://doi.org/10.1177/0271121408318799

Barton, E. E., & Wolery, M. (2010). Training teachers to promote pretend play in young children with disabilities. *Exceptional Children*, *77*(1), 85-106. https://doi.org/10.1177/001440291007700104

Benson, S. S., Dimian, A. F., Elmquist, M., Simacek, J., McComas, J. J., & Symons, F. J. (2018). Coaching parents to assess and treat self-injurious behaviour via telehealth. *Journal of Intellectual Disability Research*, *62*(12), 1114-1123. https://doi.org/10.1111/jir.12456

Brown, J., & Murray, D. (2001). Strategies for enhancing play skills for children with autism spectrum disorder. *Education and Training in Mental Retardation and Developmental*

Disabilities, 312-317. https://www.jstor.org/stable/23879984?casa_token=hgt0f-b-vCcAAAAA%3AdkKVJ60YohyW4trSVVEJrBUIIxETWcIcmFuT7bor62NV8uCqgj4Hoy9KMRIlOjjRxao_ODxBPxE3wuPw7y3J1kuD2D7SUIJBAn7lc6eLktHqjskvifw&seq=1#metadata_info_tab_contents

Brown, J. A., & Woods, J. J. (2015). Effects of a triadic parent-implemented home-based communication intervention for toddlers. *Journal of Early Intervention*, *37*(1), 44-68. https://doi.org/10.1177/1053815115589350

Brown, J. A., & Woods, J. J. (2016). Parent-implemented communication intervention: Sequential analysis of triadic relationships. *Topics in Early Childhood Special Education*, *36*(2), 115-124. https://doi.org/10.1177/0271121416628200

Campbell, S. B., Leezenbaum, N. B., Mahoney, A. S., Moore, E. L., & Brownell, C. A. (2016). Pretend play and social engagement in toddlers at high and low genetic risk for autism spectrum disorder. *Journal of Autism and Developmental Disorders, 46*(7), 2305-2316. https://doi.org/10.1007/s10803-016-2764-y

Celiberti, D. A., & Harris, S. L. (1993). Behavioral intervention for siblings of children with autism: A focus on skills to enhance play. *Behavior Therapy*, *24*(4), 573-599. https://doi.org/10.1016/S0005-7894(05)80319-3

Chan, J. M., Lang, R., Rispoli, M., O'Reilly, M., Sigafoos, J., Cole, H. (2009). Use of peer-mediated interventions in the treatment of autism spectrum disorders: A systematic review. *Research in Autism Spectrum Disorders, 3*, 876–889. https://doi.org/10.1016/j.rasd.2009.04.003

Chung, M. Y., Meadan, H., Snodgrass, M. R., Hacker, R. E., Sands, M. M., Adams, N. B., &

Johnston, S. S. (2020). Assessing the social validity of a telepractice training and coaching intervention. *Journal of Behavioral Education*, 1-27. https://doi.org/10.1007/s10864-020-09372-8

Coe, D. A., Matson, J. L., Craigie, C. J., & Gossen, M. A. (1991). Play skills of autistic children: Assessment and instruction. *Child & Family Behavior Therapy, 13*(3), 13–40. https://doi.org/10.1300/J019v13n03_02

Collins, B. C., Lo, Y. Y., Park, G., & Haughney, K. (2018). Response prompting as an ABA-based instructional approach for teaching students with disabilities. *Teaching Exceptional Children*, *50*(6), 343-355. https://doi.org/10.1177/0040059918774920

Cox, A., & AFIRM Team. (2018). Video modeling. Chapel Hill: National Professional Development Center on Autism Spectrum Disorders, FPG Child Development Center, *University of North Carolina*. Retrieved from http://afirm.fpg.unc.edu/video-modeling

Chang, Y. C., & Locke, J. (2016). A systematic review of peer-mediated interventions for children with autism spectrum disorder. *Research in Autism Spectrum Disorders*, *27*, 1-10. https://doi.org/10.1016/j.rasd.2016.03.010

Charman, T., Baron-Cohen, S., Swettenham, J., Baird, G., Drew, A., & Cox, A. (2003). Predicting language outcome in infants with autism and pervasive developmental disorder. *International Journal of Language & Communication Disorders*, *38*(3), 265-285. https://doi.org/10.1080/136820310000104830

Dauphin, M., Kinney, E. M., Stromer, R., & Koegel, R. L. (2004). Using video-enhanced activity schedules and matrix training to teach sociodramatic play to a child with autism. *Journal of Positive Behavior Interventions*, *6*(4), 238-250. https://doi.org/10.1177/10983007040060040501

Davis, P. E., Simon, H., Meins, E., & Robins, D. L. (2018). Imaginary companions in children with autism spectrum disorder. *Journal of Autism and Developmental disorders, 48*(8), 2790-2799. https://doi.org/10.1007/s10803-018-3540-y

Diener, M. L., Anderson, L., Wright, C. A., & Dunn, M. L. (2015). Sibling relationships of children with autism spectrum disorder in the context of everyday life and a strength-based program. *Journal of Child and Family Studies*, *24*(4), 1060-1072. https://doi.org/10.1007/s10826-014-9915-6

Donaldson, A. L. (2015). Siblings of children with ASD: Promoting social communication. *Perspectives on Language Learning and Education*, *22*(1), 31-38. https://doi.org/10.1044/lle22.1.31

Douglas, S. N., Kammes, R., & Nordquist, E. (2018). Online communication training for parents of children with autism spectrum disorder. *Communication Disorders Quarterly*, *39*(3), 415-425. https://doi.org/10.1177/1525740117727491

El-Ghoroury, N. H., & Romanczyk, R. G. (1999). Play interactions of family members towards children with autism. *Journal of Autism and Developmental Disorders*, *29*(3), 249-258. https://doi.org/10.1023/A:1023036223397

Feinberg, M. E., Solmeyer, A. R., & McHale, S. M. (2012). The third rail of family systems: Sibling relationships, mental and behavioral health, and preventive intervention in childhood and adolescence. *Clinical Child and Family Psychology Review*, *15*(1), 43-57. https://doi.org/10.1007/s10567-011-0104-5

Ferguson, J., Craig, E. A., & Dounavi, K. (2019). Telehealth as a model for providing behaviour

analytic interventions to individuals with autism spectrum disorder: A systematic review. *Journal of Autism and Developmental Disorders*, *49*(2), 582-616. https://doi.org/10.1007/s10803-018-3724-5

Ferraioli, S. J., Hansford, A., & Harris, S. L. (2012). Benefits of including siblings in the treatment of autism spectrum disorders. *Cognitive and Behavioral Practice*, *19*(3), 413-422. https://doi.org/10.1016/j.cbpra.2010.05.005

Fettig, A., Schultz, T. R., & Ostrosky, M. M. (2013). Collaborating with parents in using effective strategies to reduce children's challenging behaviors. *Young Exceptional Children*, *16*(1), 30-41. https://doi.org/10.1177/1096250612473127

Fettig, A., Schultz, T. R., & Sreckovic, M. A. (2015). Effects of coaching on the implementation of functional assessment-based parent intervention in reducing challenging behaviors. *Journal of Positive Behavior Interventions*, *17*(3), 170-180. https://doi.org/10.1177/1098300714564164

Friedman, M., Woods, J., & Salisbury, C. (2012). Caregiver coaching strategies for early intervention providers: Moving toward operational definitions. *Infants & Young Children*, *25*(1), 62-82. http://doi.org/10.1097/IYC.0b013e31823d8f12

Ganz, J. B., & Flores, M. M. (2008). Effects of the use of visual strategies in play groups for children with autism spectrum disorders and their peers. *Journal of Autism and Developmental Disorders*, *38*(5), 926-940. https://doi.org/10.1007/s10803-007-0463-4

Gerow, S., Radhakrishnan, S., Davis, T. N., Zambrano, J., Avery, S., Cosottile, D. W., & Exline, E. (2021). Parent-implemented brief functional analysis and treatment with coaching via telehealth. *Journal of Applied Behavior Analysis*, *54*(1), 54-69. https://doi.org/10.1002/jaba.801

Gerow, S., Rispoli, M., Ninci, J., Gregori, E. V., & Hagan-Burke, S. (2018). Teaching parents to implement functional communication training for young children with developmental delays. *Topics in Early Childhood Special Education*, *38*(2), 68-81. https://doi.org/10.1177/0271121417740637

Gillett, J. N., & LeBlanc, L. A. (2007). Parent-implemented natural language paradigm to increase language and play in children with autism. *Research in Autism Spectrum Disorders*, *1*, 247-255. https://doi.org/10.1016/j.rasd.2006.09.003

Ginsburg, K. R. (2007). The importance of play in promoting healthy child development and maintaining strong parent-child bonds. *Pediatrics*, *119*(1), 182-191. https://doi.org/10.1542/peds.2006-2697

Glugatch, L. B., & Machalicek, W. (2021). Examination of the effectiveness and acceptability of a play-based sibling intervention for children with autism: A single-case research design. *Education and Treatment of Children*, 1-19. https://doi.org/10.1007/s43494-021-00043-5

Goldstein, H., & Cisar, C. L. (1992). Promoting interaction during sociodramatic play: Teaching scripts to typical preschoolers and classmates with disabilities. *Journal of Applied Behavior Analysis*, *25*(2), 265-280. https://doi.org/10.1901/jaba.1992.25-265

Goldstein, T. R., & Lerner, M. D. (2018). Dramatic pretend play games uniquely improve emotional control in young children. *Developmental science*, *21*(4), e12603. https://doi.org/10.1111/desc.12603

Goldstein, H., Schneider, N., Thiemann, K. (2007). Peer-mediated social communication intervention: When clinical expertise informs treatment development and evaluation. *Topics in Language Disorders*, *27*, 182-199.

http://doi.org/10.1097/01.TLD.0000269932.26504.a8

Gomez, L., Barton, E. E., Winchester, C., & Locchetta, B. (2021). Effects of email performance feedback on teachers' use of play expansions. *Journal of Early Intervention*, *43*(3), 235-254. https://doi.org/10.1177/1053815120969821

Hemmeter, M. L., Snyder, P., Kinder, K., & Artman, K. (2011). Impact of performance feedback delivered via electronic mail on preschool teachers' use of descriptive praise. *Early Childhood Research Quarterly*, *26*(1), 96-109. https://doi.org/10.1016/j.ecresq.2010.05.004

Hendricks, D.R. (2009). *Overview of parent-implemented intervention.* Chapel Hill: The National Professional Development Center on ASD, Frank Porter Graham Child Development Institute, University of North Carolina. Retrieved from: https://autismpdc.fpg.unc.edu/sites/autismpdc.fpg.unc.edu/files/imce/documents/Parent-Implemented-Intervention-Complete10-2010.pdf

Hobson, R. P., Lee, A., & Hobson, J. A. (2009). Qualities of symbolic play among children with autism: A social-developmental perspective. *Journal of Autism and Developmental Disorders*, *39*(1), 12. https://doi.org/10.1007/s10803-008-0589-z

Hume, K., Sam, A., Mokrova, I., Reszka, S., & Boyd, B. A. (2019). Facilitating social interactions with peers in specialized early childhood settings for young children with ASD. *School Psychology Review*, *48*(2), 123-132. https://doi.org/10.17105/SPR-2017-0134.V48-2

Ingersoll, B., & Gergans, S. (2007). The effect of a parent-implemented imitation intervention on spontaneous imitation skills in young children with autism. *Research in Developmental Disabilities*, *28*(2), 163-175. https://doi.org/10.1016/j.ridd.2006.02.004

Ingersoll, B., Wainer, A. L., Berger, N. I., Pickard, K. E., & Bonter, N. (2016). Comparison of a self-directed and therapist-assisted telehealth parent-mediated intervention for children with ASD: A pilot RCT. *Journal of Autism and Developmental Disorders*, *46*(7), 2275-2284. https://doi.org/10.1007/s10803-016-2755-z

Jaggy, A. K., Mainhard, T., Sticca, F., & Perren, S. (2020). The emergence of dyadic pretend play quality during peer play: The role of child competence, play partner competence and dyadic constellation. *Social Development, 2020.* https://doi.org/10.1111/sode.12445

Jarrold, C. (2003). A review of research into pretend play in autism. *Autism*, *7*(4), 379-390. https://doi.org/10.1177/1362361303007004004

Jung, S., & Sainato, D. (2013). Teaching play skills to young children with autism. *Journal of Intellectual and Developmental Disability*, *38*(1), 74-90. https://doi.org/10.3109/13668250.2012.732220

Kamps, D., Thiemann-Bourque, K., Heitzman-Powell, L., Schwartz, I., Rosenberg, N., Mason, R., & Cox, S. (2015). A comprehensive peer network intervention to improve social communication of children with autism spectrum disorders: A randomized trial in kindergarten and first grade. *Journal of Autism and Developmental Disorders, 45*(6), 1809-1824. https://doi.org/10.1007/s10803-014-2340-2

Kasari, C., Chang, Y. C., & Patterson, S. (2013). Pretending to play or playing to pretend: The case of autism. *American Journal of Play*, *6*(1), 124. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4662258/

Kaiser, A. P., & Roberts, M. Y. (2013). Parent-implemented enhanced milieu teaching with preschool children who have intellectual disabilities. *Journal of Speech, Language, and Hearing Research*. https://doi.org/10.1044/1092-4388

Kashinath, S., Woods, J., & Goldstein, H. (2006). Enhancing generalized teaching strategy use in daily routines by parents of children with autism. *Journal of Speech, Language, and Hearing Research*. https://doi.org/10.1044/1092-4388

Kemp, P., & Turnbull, A. P. (2014). Coaching with parents in early intervention: An interdisciplinary research synthesis. *Infants & Young Children*, *27*(4), 305-324. http://doi:10.1097/IYC.0000000000000018

Kretlow, A. G., & Bartholomew, C. C. (2010). Using coaching to improve the fidelity of evidence-based practices: A review of studies. *Teacher Education and Special Education*, *33*(4), 279-299. https://doi.org/10.1177/0888406410371643

Lang, R., O'Reilly, M., Rispoli, M., Shogren, K., Machalicek, W., Sigafoos, J., & Regester, A. (2009). Review of interventions to increase functional and symbolic play in children with autism. *Education and Training in Developmental Disabilities*, 481-492. http://www.jstor.org/stable/24234257

Ledford, J. R., & Gast, D. L. (Eds.). (2018). *Single case research methodology: Applications in special education and behavioral sciences*. Routledge.

Ledford, J. R., Lane, J. D., Elam, K. L., & Wolery, M. (2012). Using response-prompting procedures during small-group direct instruction: Outcomes and procedural variations. *American Journal on Intellectual and Developmental Disabilities*, *117*(5), 413-434. https://doi.org/10.1352/1944-7558-117.5.413

Lerman, D. C., O'Brien, M. J., Neely, L., Call, N. A., Tsami, L., Schieltz, K. M., ... & Cooper-

Brown, L. J. (2020). Remote coaching of caregivers via telehealth: Challenges and potential solutions. *Journal of Behavioral Education*, *29*(2), 195-221. https://doi.org/10.1007/s10864-020-09378-2

Li, J., Hestenes, L. L., & Wang, Y. C. (2016). Links between preschool children's social skills and observed pretend play in outdoor childcare environments. *Early Childhood Education Journal*, *44*(1), 61-68. http://doi.org/10.1007/s10643-014-0673-2

Lifter, K., Ellis, J., Cannon, B., & Anderson, S. R. (2005). Developmental specificity in targeting and teaching play activities to children with pervasive developmental disorders. *Journal of Early Intervention*, *27*(4), 247-267. https://doi.org/10.1177/105381510502700405

Lifter, K., Mason, E. J., & Barton, E. E. (2011). Children's play: Where we have been and where we could go. *Journal of Early Intervention*, *33*(4), 281-297. https://doi.org/10.1177/1053815111429465

Lillard, A. S., Lerner, M. D., Hopkins, E. J., Dore, R. A., Smith, E. D., & Palmquist, C. M. (2013). The impact of pretend play on children's development: A review of the evidence. *Psychological bulletin*, *139*(1), 1. https://doi.org/10.1037/a0029321

Locke, J., Rotheram-Fuller, E., & Kasari, C. (2012). Exploring the social impact of being a typical peer model for included children with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, *42*(9), 1895- 1905. https://doi.org/10.1007/s10803-011-1437-0

Lory, C., Rispoli, M., & Gregori, E. (2018). Play interventions involving children with autism spectrum disorder and typically developing peers: A review of research quality. *Review Journal of Autism and Developmental Disorders*, *5*(1), 78-89. https://doi.org/10.1007/s40489-017-0124-2

Patry, M. B., & Horn, E. (2020). Supporting the play of preschoolers with autism through peer-mediated interventions. *Young Exceptional Children*, *23*(1), 3-14. https://doi.org/10.1177/1096250618782179

MacDonald, R., Clark, M., Garrigan, E., & Vangala, M. (2005). Using video modeling to teach pretend play to children with autism. *Behavioral Interventions: Theory & Practice in Residential & Community-Based Clinical Programs*, *20*(4), 225-238. https://doi.org/10.1002/bin.197

MacDonald, R., Sacramone, S., Mansfield, R., Wiltz, K., & Ahearn, W. H. (2009). Using video modeling to teach reciprocal pretend play to children with autism. *Journal of Applied Behavior Analysis*, *42*(1), 43-55. https://doi.org/10.1901/jaba.2009.42-43

Marturana, E. R., & Woods, J. J. (2012). Technology-supported performance-based feedback for early intervention home visiting. *Topics in Early Childhood Special Education*, *32*(1), 14-23. https://doi.org/10.1177/0271121411434935

Meadan, H., Ostrosky, M. M., Zaghlawan, H. Y., & Yu, S. (2012). Using coaching with preschool teachers to support the social skills of children with and without autism spectrum disorders. *International Journal of Early Childhood Special Education*, *4*(2). https://eae.anadolu.edu.tr/resources/assets/upload/publication/20141112172116_mkl.pdf

Meadan, H., Snodgrass, M. R., Meyer, L. E., Fisher, K. W., Chung, M. Y., & Halle, J. W. (2016). Internet-based parent-implemented intervention for young children with autism: A pilot study. *Journal of Early Intervention*, *38*(1), 3-23. https://doi.org/10.1177/1053815116630327

McConnell, S. R. (2002). Interventions to facilitate social interaction for young children with

autism: Review of available research and recommendations for educational intervention and future research. *Journal of Autism and Developmental Disorders*, *32*(5), 351-372. https://doi.org/10.1023/A:1020537805154

McLeod, R. H., Kim, S., & Resua, K. A. (2019). The effects of coaching with video and email feedback on preservice teachers' use of recommended practices. *Topics in Early Childhood Special Education*, *38*(4), 192-203. https://doi.org/10.1177/0271121418763531

McDuffie, A., Machalicek, W., Oakes, A., Haebig, E., Weismer, S. E., & Abbeduto, L. (2013). Distance video-teleconferencing in early intervention: Pilot study of a naturalistic parent-implemented language intervention. *Topics in Early Childhood Special Education*, *33*(3), 172-185. https://doi.org/10.1177/0271121413476348

McHale, S. M., Updegraff, K. A., & Feinberg, M. E. (2016). Siblings of youth with autism spectrum disorders: Theoretical perspectives on sibling relationships and individual adjustment. *Journal of Autism and Developmental Disorders*, *46*(2), 589-602. http://doi.org/10.1007/s10803-015-2611-6

Morrison, R. S., Sainato, D. M., Benchaaban, D., & Endo, S. (2002). Increasing play skills of children with autism using activity schedules and correspondence training. *Journal of Early Intervention*, *25*(1), 58-72. https://doi.org/10.1177/105381510202500106

Murdock, L. C., & Hobbs, J. Q. (2011). Picture me playing: Increasing pretend play dialogue of children with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, *41*(7), 870-878. https://doi.org/10.1007/s10803-010-1108-6

National Association for the Education of Young Children (2020). *Developmentally appropriate*

practice: A position statement of the National Association for the Education of Young Children. https://www.naeyc.org/sites/default/files/globally-shared/downloads/PDFs/resources/position-statements/dap-statement_0.pdf

Neely, L., Rispoli, M., Gerow, S., Hong, E. R., & Hagan-Burke, S. (2017). Fidelity outcomes for autism-focused interventionists coached via telepractice: A systematic literature review. *Journal of Developmental and Physical Disabilities*, *29*(6), 849-874. https://doi.org/10.1007/s10882-017-9550-4

Odom, S. L. (2019). Peer-based interventions for children and youth with autism spectrum disorder: History and effects. *School Psychology Review*, *48*(2), 170-176. https://doi.org/10.17105/SPR-2019-0019.V48-2

Odom, S. L. (1991). Reducing teacher prompts in peer-mediated interventions for young children with autism. *The Journal of Special Education*, *25*(1), 26-43. https://doi.org/10.1177/002246699102500103

Odom, S. L., Boyd, B., Hall, L., & Hume, K. (2010). Evaluation of comprehensive treatment models for individuals with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, *40*, 425–436. https://doi.org/10.1007/s10803-009-0825-1

Odom, S. L., Vitztum, J., Wolery, R., Lieber, J., Sandall, S., Hanson, M. J., ... & Horn, E. (2004). Preschool inclusion in the United States: A review of research from an ecological systems perspective. *Journal of research in special educational needs*, *4*(1), 17-49. https://doi.org/10.1111/J.1471-3802.2004.00016.x

O'Flaherty, C., Barton, E. E., Winchester, C., & Domingo, M. (2019). Coaching teachers to promote social interactions with toddlers. *Journal of Positive Behavior Interventions, 21(4),* 199-212. https://doi.org/10.1177/1098300719851794

Oppenheim-Leaf, M. L., Leaf, J. B., Dozier, C., Sheldon, J. B., & Sherman, J. A. (2012). Teaching typically developing children to promote social play with their siblings with autism. *Research in Autism Spectrum Disorders*, *6*(2), 777-791. https://doi.org/10.1016/j.rasd.2011.10.010

Ottley, J. R., & Hanline, M. F. (2014). Bug-in-ear coaching: Impacts on early childhood educators' practices and associations with toddlers' expressive communication. *Journal of Early Intervention*, *36*(2), 90-110. https://doi.org/10.1177/1053815114563614

Ozcan, N., & Cavkaytar, A. (2009). Parents as teachers: Teaching parents how to teach toilet skills to their children with autism and mental retardation. *Education and Training in Developmental Disabilities*, 237-243. http://daddcec.org/Publications/ETADDJournal.aspx

Powell, D., & Dunlap, G. (2010). *Family-focused interventions for promoting social-emotional development in infants and toddlers with or at risk for disabilities* (Roadmap to Effective Intervention Practices# 5). Tampa: Technical Assistance Center on Social Emotional Intervention for Young Children, University of South Florida. https://files.eric.ed.gov/fulltext/ED577841.pdf

Reagon, K. A., Higbee, T. S., & Endicott, K. (2006). Teaching pretend play skills to a student with autism using video modeling with a sibling as model and play partner. *Education and Treatment of Children*, 517-528. http://www.jstor.org/stable/42899899

Reichow, B., Barton, E. E., & Maggin, D. M. (2018). Development and applications of the single-case design risk of bias tool for evaluating single-case design research study reports. *Research in Developmental Disabilities*, *79*, 53-64. https://doi.org/10.1016/j.ridd.2018.05.008

Reinke, W. M., Stormont, M., Webster-Stratton, C., Newcomer, L. L., & Herman, K. C. (2012). The incredible years teacher classroom management program: Using coaching to support generalization to real-world classroom settings. *Psychology in the Schools, 49*(5), 416-428. https://doi.org/10.1002/pits.21608

Roberts, M. Y., Kaiser, A. P., Wolfe, C. E., Bryant, J. D., & Spidalieri, A. M. (2014). Effects of the teach-model-coach-review instructional approach on caregiver use of language support strategies and children's expressive language skills. *Journal of Speech, Language, and Hearing Research, 57*(5), 1851-1869. https://doi.org/10.1044/2014_JSLHR-L-13-0113

Romano, M., & Schnurr, M. (2020). Mind the gap: Strategies to bridge the research-to-practice divide in early intervention caregiver coaching practices. *Topics in Early Childhood Special Education*, 1-13. https://doi.org/10.1177/0271121419899163

Sainato, D. M., Goldstein, H., & Strain, P. S. (1992). Effects of self-evaluation on preschool children's use of social interaction strategies with their classmates with autism. *Journal of Applied Behavior Analysis*, *25*(1), 127-141. https://doi.org/10.1901/jaba.1992.25-127

Sam, A., & AFIRM Team. (2015). Time delay. Chapel Hill: National Professional Development Center on Autism Spectrum Disorder, FPG Child Development Center, *University of North Carolina*. Retrieved from https://afirm.fpg.unc.edu/sites/afirm.fpg.unc.edu/files/imce/resources/TD%20EBP%20Brief%20Packet.

Saral, D., & Ulke-Kurkcuoglu, B. (2020). Using least-to-most prompting to increase the frequency and diversity of pretend play in children with autism. *Topics in Early Childhood Special Education*, 1-17. https://doi.org/10.1177/0271121420942850

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*, 64, 1-114. http://www.jstor.org/stable/3181510

Simacek, J., Elmquist, M., Dimian, A. F., & Reichle, J. (2021). Current trends in telehealth applications to deliver social communication interventions for young children with or at risk for autism spectrum disorder. *Current Developmental Disorders Reports*, *8*(1), 15-23. https://doi.org/10.1007/s40474-020-00214-w

Snodgrass, M. R., Chung, M. Y., Biller, M. F., Appel, K. E., Meadan, H., & Halle, J. W. (2017). Telepractice in speech-language therapy: The use of online technologies for parent training and coaching. *Communication Disorders Quarterly*, *38*(4), 242-254. https://doi.org/10.1177/1525740116680424

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

Spector, V., & Charlop, M. H. (2018). A sibling-mediated intervention for children with autism spectrum disorder: Using the natural language paradigm (NLP). *Journal of Autism and Developmental Disorders*, *48*(5), 1508-1522. https://doi.org/10.1007/s10803-017-3404-x

Sperry, L., Neitzel, J., & Engelhardt-Wells, K. (2010). Peer-mediated instruction and intervention strategies for students with autism spectrum disorders. *Preventing School Failure, 54*, 256–264. https://doi.org/10.1080/10459881003800529

Stahmer, A. C. (1995). Teaching symbolic play skills to children with autism using pivotal

response training. *Journal of Autism and Developmental Disorders*, *25*(2), 123-141. https://doi.org/10.1007/BF02178500

Steed, E. A., Phan, N., Leech, N., & Charlifue-Smith, R. (2021). Remote delivery of services for young children with disabilities during the early stages of the COVID-19 pandemic in the United States. *Journal of Early Intervention*, 1-20. https://doi.org/10.1177/10538151211037673

Steinbrenner, J. R., Hume, K., Odom, S. L., Morin, K. L., Nowell, S. W., Tomaszewski, B., Szendrey, S., McIntyre, N. S., Yücesoy-Özkan, S., & Savage, M. N. (2020). *Evidence-based practices for children, youth, and young adults with Autism.* The University of North Carolina at Chapel Hill, Frank Porter Graham Child Development Institute, National Clearinghouse on Autism Evidence and Practice Review Team. https://files.eric.ed.gov/fulltext/ED609029.pdf

Strain, P. S., Schwartz, I. S., & Bovey, E. H. (2008). Social competence interventions for young children with autism: Programmatic research findings and implementation issues. In W. H Brown, S. L. Odom & S. R. McConnell (Eds.), *Social competence of young children: Risk, disability, and intervention* (pp. 253–272). Paul H. Brookes.

Suess, A.N., Romani, P.W., Wacker, D.P., Dyson, S.M., Kuhle, J.L., Lee, J.F., …& Waldron, D.B. (2014). Evaluating the treatment fidelity of parents who conduct in-home functional communication training with coaching via telehealth. *Journal of Behavioral Education, 23*(1), 34-59. https://doi.org/10.1007/s10864-013-9183-3

Quinn, E. D., Kaiser, A. P., & Ledford, J. (2021). Hybrid telepractice delivery of enhanced

milieu teaching: Effects on caregiver implementation and child communication. *Journal of Speech, Language, and Hearing Research, 64*(8), 3074-3099. https://doi.org/10.1044/2021_JSLHR-20-00430

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

Trembath, D., Balandin, S., Togher, L., & Stancliffe, R. J. (2009). Peer-mediated teaching and augmentative and alternative communication for preschool-aged children with autism. *Journal of Intellectual and Developmental Disability, 34*(2), 173-186. https://doi.org/10.1080/13668250902845210

Trivette, C. M., Dunst, C. J., & Hamby, D. W. (2010). Influences of family-systems intervention practices on parent-child interactions and child development. *Topics in Early Childhood Special Education, 30*(1), 3-19. https://doi.org/10.1177/0271121410364250

Thompson, B. N., & Goldstein, T. R. (2019). Disentangling pretend play measurement: Defining the essential elements and developmental progression of pretense. *Developmental Review, 52,* 24-41. https://doi.org/10.1016/j.dr.2019.100867

Tomeny, K. R., McWilliam, R. A., & Tomeny, T. S. (2020). Caregiver-implemented intervention for young children with autism spectrum disorder: A systematic review of coaching components. *Review Journal of Autism and Developmental Disorders, 7*(2), 168-181. https://doi.org/10.1007/s40489-019-00186-7

Unholz-Bowden, E., McComas, J. J., McMaster, K. L., Girtler, S. N., Kolb, R. L., &

Shipchandler, A. (2020). Caregiver training via telehealth on behavioral procedures: A systematic review. *Journal of Behavioral Education, 29*(2), 246-281. https://doi.org/10.1007/s10864-020-09381-7

Wainer, A. L., & Ingersoll, B. R. (2015). Increasing access to an ASD imitation intervention via a telehealth parent training program. *Journal of Autism and Developmental Disorders*, *45*(12), 3877-3890. https://doi.org/10.1007/s10803-014-2186-7

Waldinger, R. J., Vaillant, G. E., & Orav, E. J. (2007). Childhood sibling relationships as a predictor of major depression in adulthood: A 30-year prospective study. *American Journal of Psychiatry*, *164*(6), 949-954. https://ajp.psychiatryonline.org/doi/pdf/10.1176/ajp.2007.164.6.949

Walton, K. M., Ingersoll, B. R. (2012). Evaluation of a sibling-mediated imitation intervention for young children with autism. *Journal of Positive Behavior Interventions*, *14*(4), 241-253. https://doi.org/10.1177/1098300712437044

Wang, S., Cui, Y., Parrila, R. (2011). Examining the effectiveness of peer-mediated and video-modeling social skills interventions for children with autism spectrum disorders: A meta-analysis in single-case research using HLM. *Research in Autism Spectrum Disorders, 5*, 562-569. https://doi.org/10.1016/j.rasd.2010.06.023

Wattanawongwan, S., Ganz, J. B., Pierson, L. M., Yllades, V., Liao, C. Y., & Ura, S. K. (2020). Communication intervention implementation via telepractice parent coaching: Child outcomes and correlations. *Journal of Special Education Technology*, 1-14. https://doi.org/10.1177/0162643420962007

Waugh, R. E., Alberto, P. A., & Fredrick, L. D. (2011). Simultaneous prompting: An instructional strategy for skill acquisition. *Education and Training in Autism and*

Developmental Disabilities, 528-543. http://www.jstor.org/stable/24232364

Watkins, L., Tomeny, T., O'Reilly, M., Sillis, K.H., & Zamora, C. (2021). A naturalistic behavioral intervention to increase interaction between siblings with and without autism. *Behavior Modification*, *45*(6), 863-886. https://doi.org/10.1177/0145445520920813

Weisberg, D. S. (2015). Pretend play. *Wiley Interdisciplinary Reviews: Cognitive Science*, *6*(3), 249-261. https://doi.org/10.1002/wcs.1341

Windsor, K. S., Woods, J., Kaiser, A. P., Snyder, P., & Salisbury, C. (2019). Caregiver-implemented intervention for communication and motor outcomes for infants and toddlers. *Topics in Early Childhood Special Education*, *39*(2), 73-87. https://doi.org/10.1177/0271121418815250

Wolfberg, P., Bottema-Beutel, K., & DeWitt, M. (2012). Including children with autism in social and imaginary play with typical peers: Integrated play groups model. *American Journal of Play*, *5*(1), 55-80. https://files.eric.ed.gov/fulltext/EJ985604.pdf

Wolery, M., Ault, M. J., & Doyle, P. M. (1992). *Teaching students with moderate to severe disabilities: Use of response prompting strategies*. Longman Publishing Group.

Wolery, M., Holcombe, A., Cybriwsky, C., Doyle, P. M., Schuster, J. W., Ault, M. J., & Gast, D. L. (1992). Constant time delay with discrete responses: A review of effectiveness and demographic, procedural, and methodological parameters. *Research in Developmental Disabilities*, *13*(3), 239-266. https://doi.org/10.1016/0891-4222(92)90028-5

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

Woods, J. J., & Brown, J. A. (2011). Integrating family capacity-building and child outcomes to support social communication development in young children with autism spectrum disorder. *Topics in Language Disorders*, *31*(3), 235-246. http://doi.org/10.1097/TLD.0b013e318227fde4

Woods, J. J., Wilcox, M. J., Friedman, M., & Murch, T. (2011). Collaborative consultation in natural environments: Strategies to enhance family-centered supports and services. *Language, Speech, and Hearing Services in Schools, 42,* 379-392. http://doi.org/10.1097/TLD.0b013e318227fde4

Zercher, C., Hunt, P., Schuler, A., & Webster, J. (2001). Increasing joint attention, play and language through peer supported play. *Autism*, *5*(4), 374-398. https://doi.org/10.1177/1362361301005004004

Tables and Figures

Table 1

Definitions and Examples of the Three Targeted Type of Pretend Play Behaviors

	Targeted Play Behavior	Definition	General Examples
Pretend play behavior 1	Functional play with pretense (FPP)	Child uses toys or actual objects in the manner in which they are intended without reality-based outcomes	Feed stuffed animal with toy food Cook breakfast with toy food
Pretend play behavior 2	Object substitution (OS)	Child uses object as if they were something else	Using a block as cake and feed stuffed animal some cake Using a block as a car and drive the car around Using a block as pizza and bake some pizza in the oven
Pretend play behavior 3	Imagining absent objects (IAO)	Child performs a play an action as if an object were present	Feed stuffed animal with imaginary food Put imaginary sugar in the juice Rescue an imaginary friend with an ambulance

Table 2

Definitions, Examples and Non-examples of Child Behavior

Child behaviors	Definition	Examples	Non-Examples
	Pretend Play Behaviors		
Functional play with pretense (FPP)	Child uses toys or actual objects in the manner in which they are intended without reality-based outcomes	Feed stuffed animal with toy food Child puts a figure in a toy car	Child Put a peg in a hole Driving a car around Child stirs spoon in empty bowl and says, "it's juice!"
Object substitution (OS)	Child uses object as if they were something else	Use a marker as ice cream Use a block as a phone	Child stirs toy spoon in empty bowl Child uses a bottle to feed a doll
Imagining absent objects (IAO)	Child performs a play (motor) action as if an object were present	Covering the baby doll with an imaginary blanket Puts an empty cup to her moth and pretend to drink	Child puts bottle to doll's mouth
Assigning absent attributes (AAA)	Child assigns dramatic roles or emotions to the self, others or objects	Child says, "the doll is sad" Child says, "I'm feeling sick" Child says, "I'm Batman today"	Having a figure jump or run Child feeds a doll with a block
Social pretend play (SPS; Social interactions within pretend play)	Child engages in various forms of pretend play (a single or multiple type (s) of pretense behavior (s) with the sibling. Social interactions should be relevant to the pretend play action. Social interaction between the children includes social response and initiation (see definitions below)	Child feeds stuffed animal with a toy apple and shares another toy apple with the sibling	Child feeds stuffed animal with a toy apple near the sibling without engage in any verbal or non-verbal interactions with the sibling

Social Interaction

Social initiation	Any verbal, or nonverbal initiations that are directed toward a sibling and that are neutral or positive in nature (e.g., sharing play materials, asking for a turn, commenting on a sibling's play or toy, inviting to join play, sharing play ideas)	Calling the sibling's name Child asks for a turn with a toy the sibling is using	Any initiations directed to an adult Any negative verbal and nonverbal initiation (e.g., aggression, take toy away from the other child's hand)
Social response	A verbal and/or nonverbal response within 5s to an initiation made by a sibling that are neutral or positive in nature (e.g., answering a sibling's question, responding to a sibling's request for sharing toys, head nodding/smile after a sibling's comment)	Responding to the sibling request within 5s to give a toy Responding to the sibling initiation by looking	Any responses initiated by an adult Any negative verbal and nonverbal responses

Table 3

Interobserver Agreement of Caregiver and Child Behavior by Participants and Experimental Condition

	Participant	Baseline *M* (range)	Caregiver-Implemented Intervention with coaching *M* (range)	Maintenance *M* (range)
% fidelity to the modeling procedure	Ann	82.50% (80 – 84%)	85.80% (82 – 88%)	91.38% (N/A)
	Lea	80.50% (80 – 81%)	86.10% (85.02 – 89%)	-
Rate of modeling trials	Ann	94.31 (93.75 – 94.87)	96.97 (90.91 – 100)	92.86 (N/A)
	Lea	86.86 (85.71 – 88.00)	93.13 (85.71 – 100)	-
Child pretend play and social interactions	Sam	90.00% (86 – 94%)	88.50% (77 – 95%)	84.38% (N/A)
	Ben	85.50% (85 – 86%)	92.75% (80 – 96%)	81.25% (N/A)
	James	80.00% (79.52 – 80.48%)	85.50% (84 – 87%)	-
	Mia	91.67% (89 – 94.34%)	84.00% (83 – 88%)	-

Table 4

Social Validity Results

Social validity items	Mean
Please tell us a little bit about your overall experience participating in this project (1 = Strongly disagree; 5 = Strongly agree)	
1. Overall, I enjoyed my time participating in this project	5.00
2. The training and feedback I received throughout this project has helped increase my understanding of different types of pretend play and play strategies	5.00
3. The 4-step modeling procedure is easy to learn	5.00
4. I found the 4-step modeling procedure easy to use when playing with my kids	5.00
5. The pretend play skills (i.e., Basic Pretend Play, Object Substitution, Imaginative Play) is easy to learn	5.00
6. I found the pretend play skills (i.e., Basic Pretend Play, Object Substitution, Imaginative Play) easy to use when playing with my kids	5.00
7. I feel more confident about playing with my kids using the pretend play strategies I have learned throughout this project	5.00
Please rate your experience participating in this project based on your satisfaction with the quality of the trainings, coaching activities as well as training materials (1= Not at all satisfied; 5 = Completely satisfied)	
8. How satisfied were you with the three training sessions?	5.00
9. How satisfied were you with the three handout packets (green/yellow/blue folders)?	5.00
10. How satisfied were you with the email feedback you received throughout this project?	5.00
Please rate your experience participating in this project based on the usefulness of trainings, coaching activities and training materials (1 = Not at all useful; 5 = Extremely useful)	
11. How useful were the three training sessions?	5.00
12. How useful were the three handout packets (green/yellow/blue folders)?	4.50
13. How useful was the email feedback you received?	5.00
14. Do you think you will continue using the modeling procedure around pretend play with your kids? (1 = Not at all likely; *5* = Very likely)	5.00
15. How likely are you to participate in this type of parent coaching in the future? (*1* = Not at all likely; *5* = Very likely)	5.00

Figure 1

Three Scenarios When Caregiver Would Use the Modeling Procedure

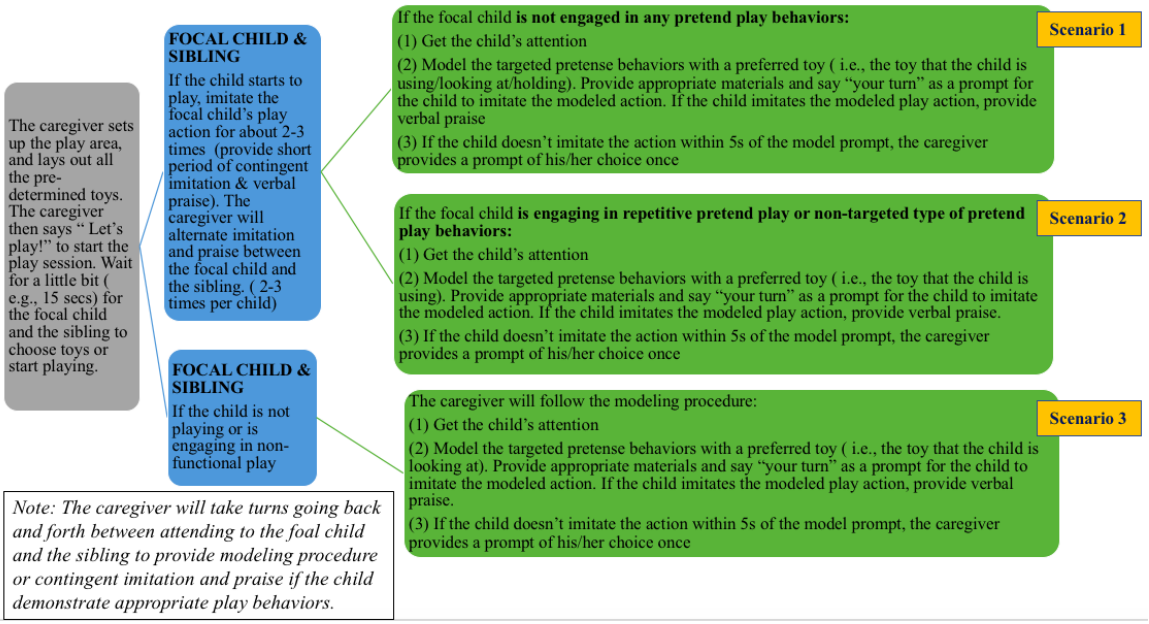
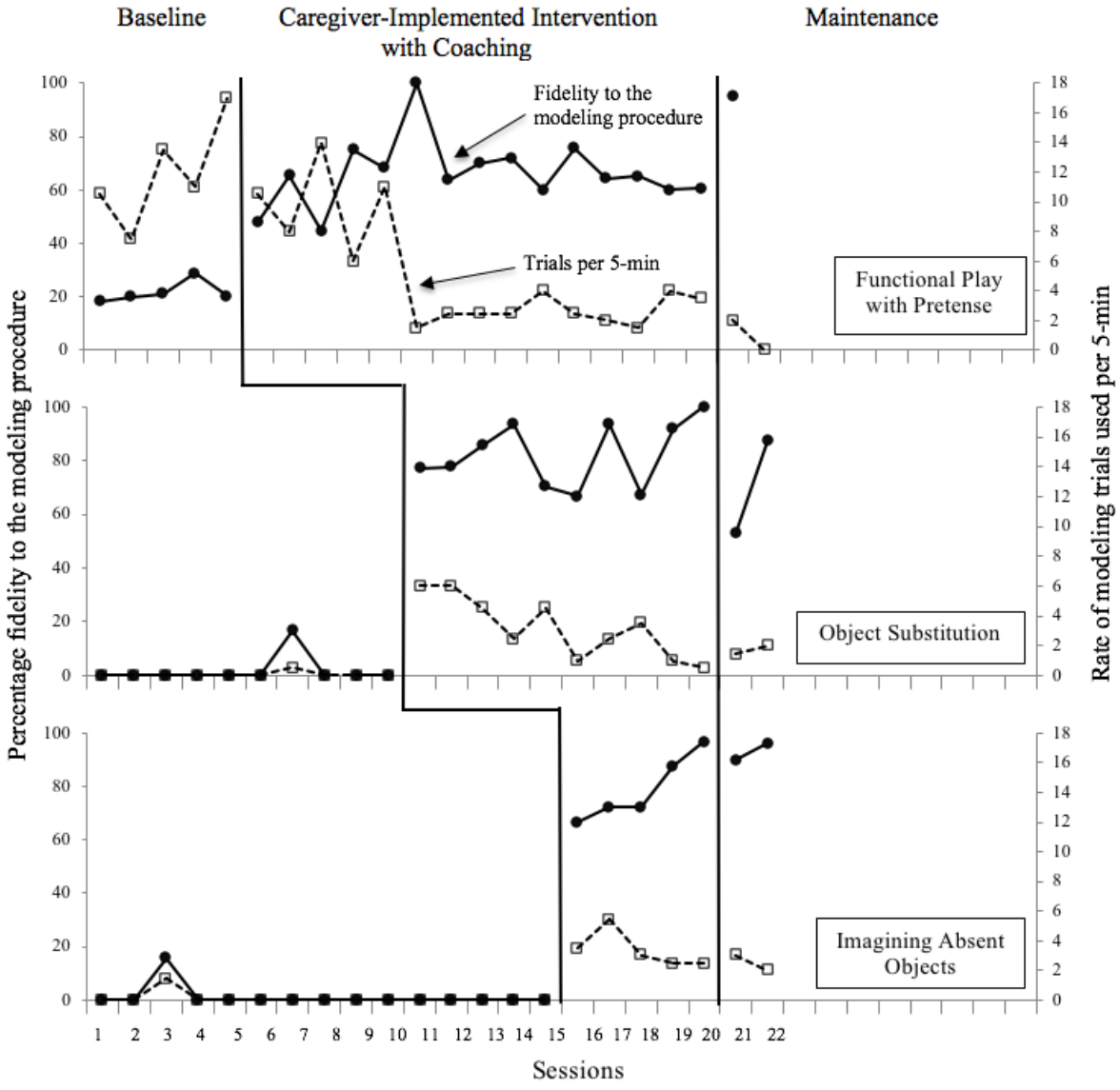


Figure 2

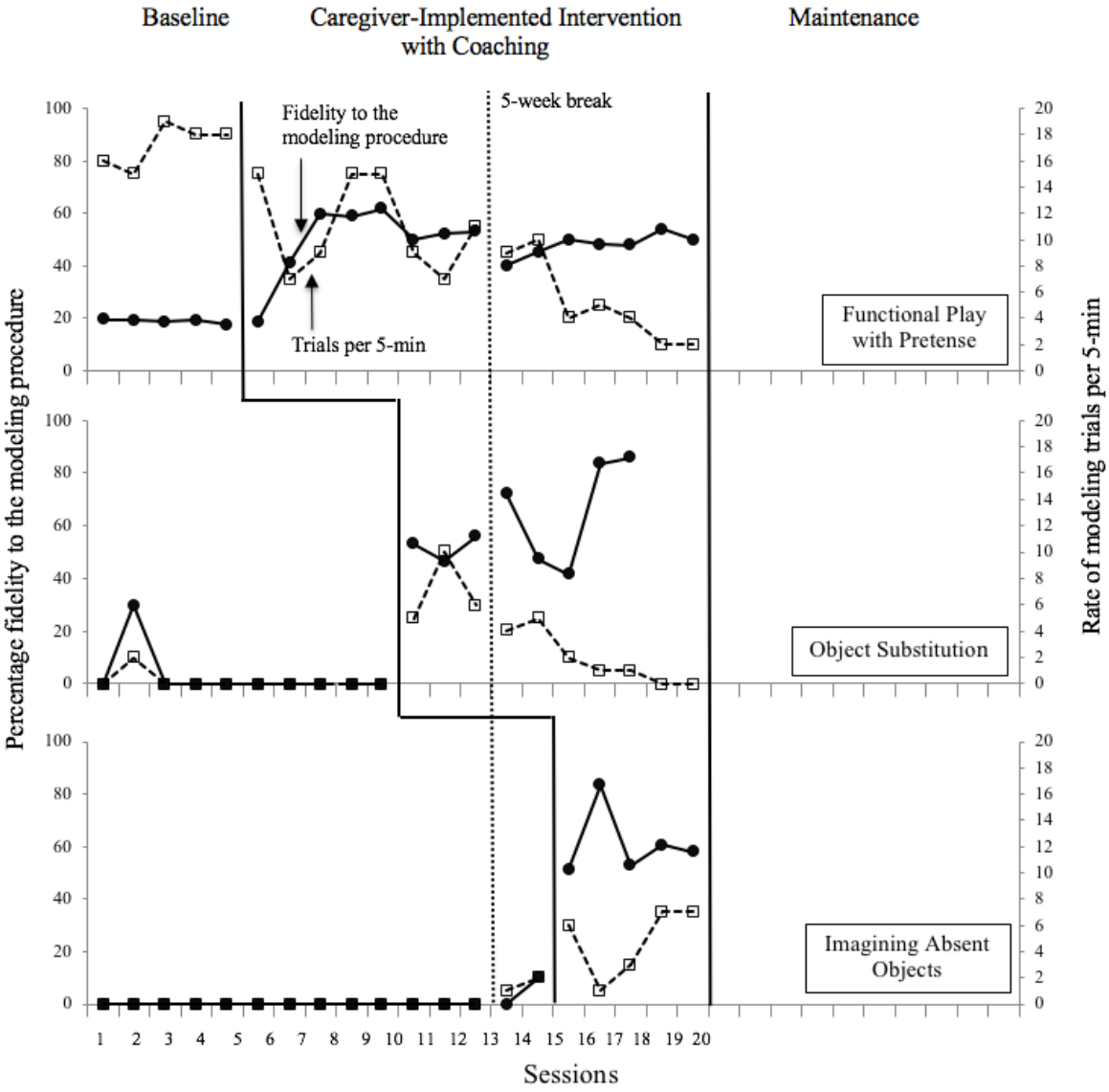
Ann (Caregiver of Triad 1)'s Percentage Fidelity to the Modeling Procedure and Rate of Modeling Trials Per 5 minutes on Functional with Pretense (FPP), Object Substitution (OS) or Imagining Absent Objects (IAO)



Note: The closed circle represents percentage fidelity to the modeling procedure. The open square represents rate of modeling trials provided per 5-min.

Figure 3

Lea (Caregiver of Triad 2)'s Percentage Fidelity to the Modeling Procedure and Rate of Modeling Trials Per 5 Minutes on Functional with Pretense (FPP), Object Substitution (OS) or Imagining Absent Objects (IAO)



Note: The closed circle represents percentage fidelity to the modeling procedure. The open square represents rate of modeling trials provided per 5-min.

Figure 4

Ann's Average Fidelity for Each Component of the 4-Step Modeling Procedure

	Step a		Step b		Step c	Step d	
	Step a Get the child's attention	Step a.1 Whether the trial was initiated under three appropriate scenarios	Step b Model one pretend play action with appropriate materials	Step b.1 Describe the play action	Step c Provide opportunity for the child to do the play action	Step d Provide descriptive praise	Step d.1 Provide an additional prompt if needed
Overall average fidelity for each component across all three targeted types of pretend play							
Bs.	0.63%	31.85%	7.72%	0.8%	2.08%	1.98%	7.12%
Int.	69.59%	97.48%	83.87%	74.70%	70.34%	70.48%	62.81%
Main.	84.62%	100%	96.155%	88.46%	92.31%	77.50%	60%
Average fidelity for each component for Functional Play with Pretense (FPP)							
Bs.	1.90%	91.08%	18.15%	2.4%	6.24%	5.93%	18.04%
Int.	59.66%	95.49%	70.46%	66.43%	58.90%	52.34%	52.60%
Main.	100%	100%	100%	50%	100%	100%	100%
Average fidelity for each component for Object Substitution (OS)							
Bs.	0%	0%	5%	0%	0%	0%	0%
Int.	68.75%	96.95%	93.85%	86.75%	89.02%	85.88%	75.84%
Main.	66.67%	100%	83.34%	100%	66.67%	66.67%	50%
Average fidelity of each component for Imagining Absent Objects (IAO)							
Bs.	0%	4.47%	0%	0%	0%	0%	3.33%
Int.	80.35%	100%	87.31%	70.93%	63.10%	73.21%	60%
Main.	83.34%	100%	100%	91.67%	100%	76.19%	66.67%

Note: Bs. = Baseline condition; Int. = Intervention condition; Main. = Maintenance.

Figure 5

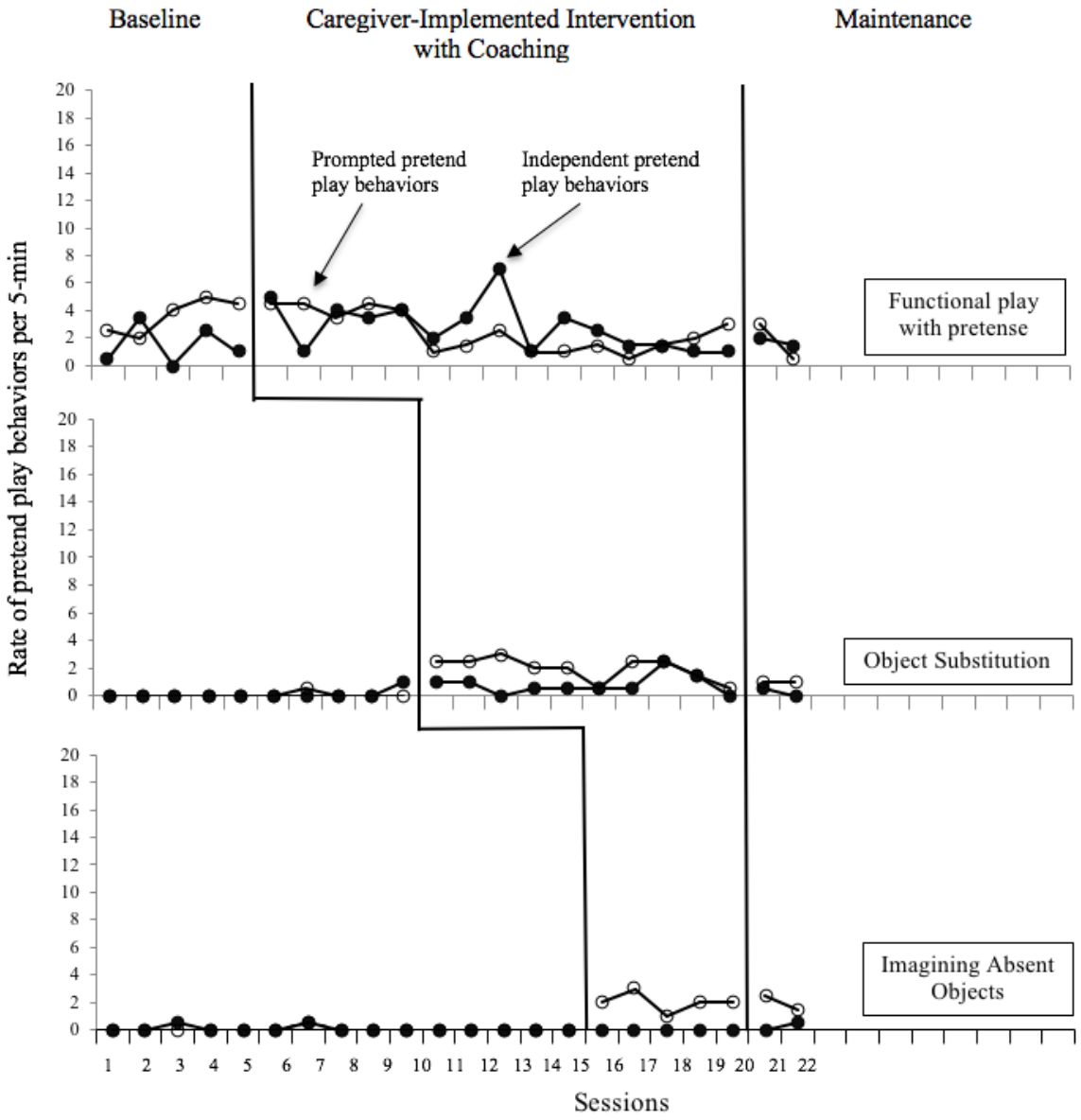
Lea's Average Fidelity for Each Component of the 4-Step Modeling Procedure

	Step a		Step b		Step c	Step d	
	Step a Get the child's attention	Step a.1 Whether the trial was initiated under three appropriate scenarios	Step b Model one pretend play action with appropriate materials	Step b.1 Describe the play action	Step c Provide opportunity for the child to do the play action	Step d Provide descriptive praise	Step d.1 Provide an additional prompt if needed
Overall average fidelity for each component across all three targeted types of pretend play							
Bs.	0.42%	29.11%	6.41%	0.44%	0%	1.62%	20.20%
Int.	48.54%	90.75%	64.25%	39.91%	56.82%	37.35%	65.77%
Average fidelity for each component for Functional Play with Pretense (FPP)							
Bs.	1.25%	77.35%	14.24%	1.33%	0%	4.87%	50.59%
Int.	35.50%	90.58%	48.63%	40.15%	44.76%	33.92%	45.22%
Average fidelity for each component for Object Substitution (OS)							
Bs.	0%	10%	5%	0%	0%	0%	10%
Int.	59.17%	81.67%	69.83%	54.34%	60%	29.83%	83.34%
Average fidelity of each component for Imagining Absent Objects (IAO)							
Bs.	0%	0%	0%	0%	0%	16.67%	16.67%
Int.	50.95%	100%	74.28%	25.24%	65.71%	48.29%	68.75%

Note: Bs. = Baseline condition; Int. = Intervention condition; Main. = Maintenance.

Figure 6

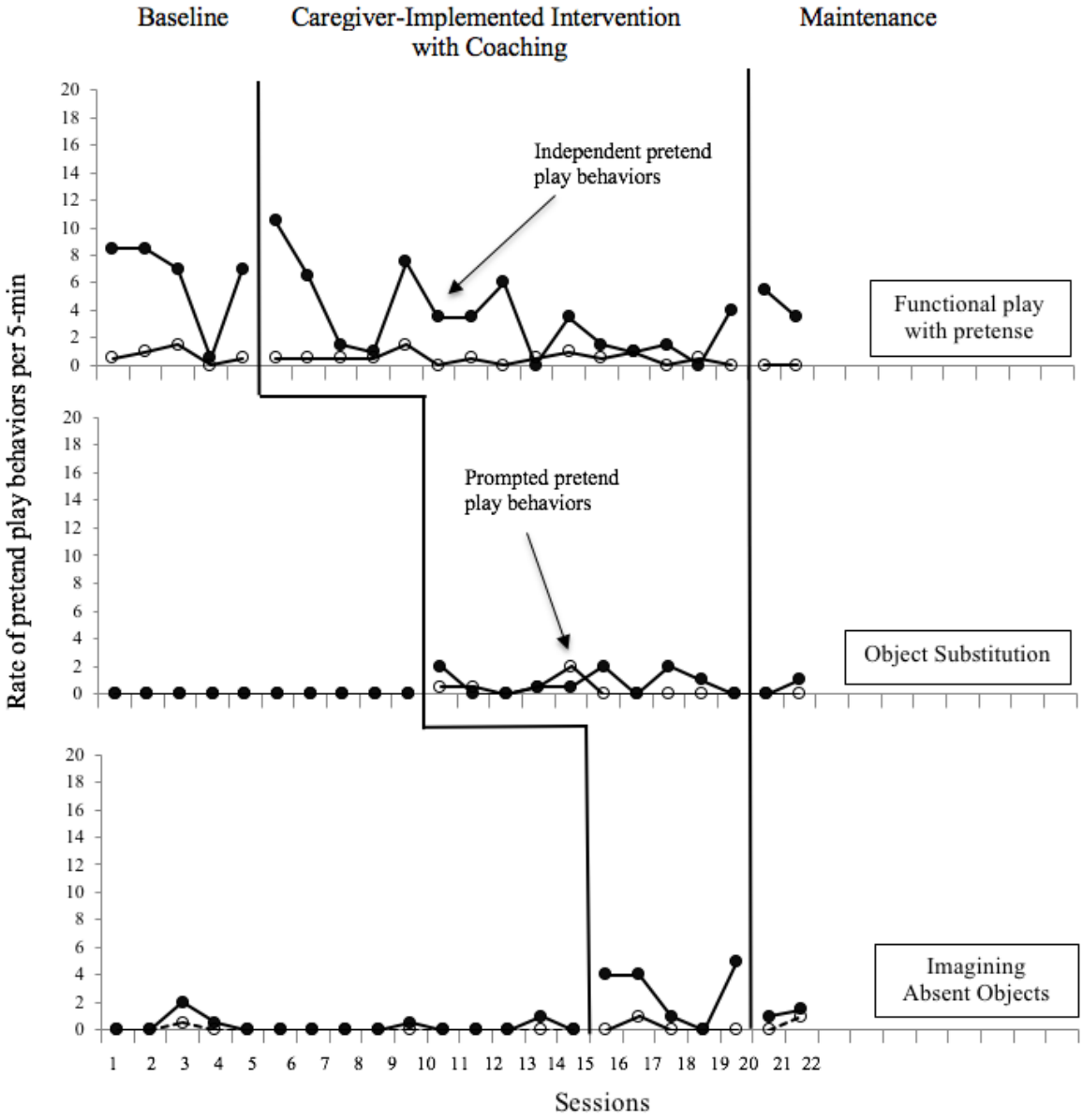
Sam (Focal Child of Triad 1)'s Rate of Prompted and Independent Functional Play with Pretense (FPP), Object Substitution (OS) or Imagining Absent Objects (IAO) Behaviors Per 5 Minutes



Note: The open circle represents prompted pretend play behaviors. The closed circle represents independent pretend play behaviors.

Figure 7

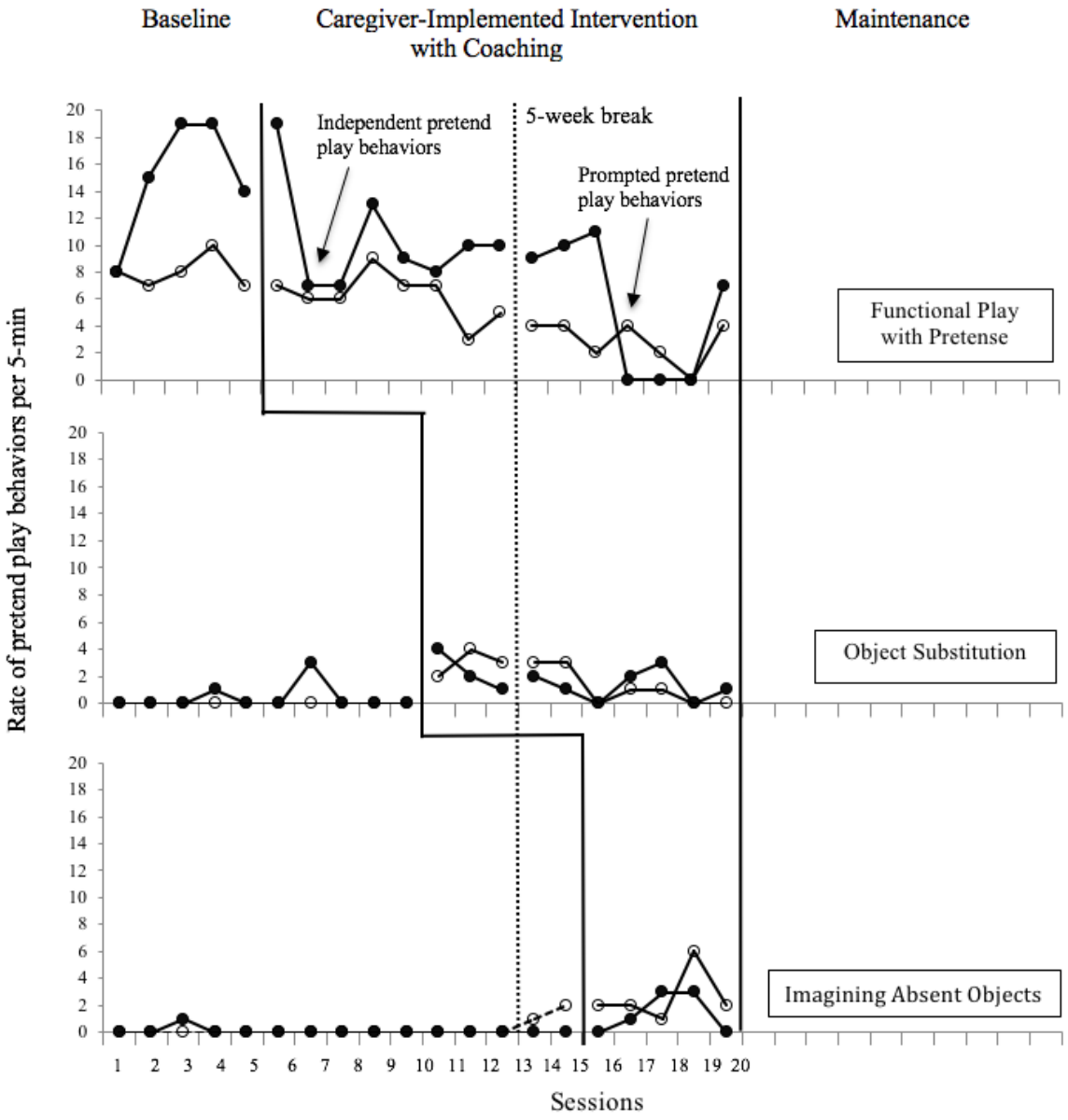
Ben (Sibling of Triad 1)'s Rate of Prompted and Independent Functional Play with Pretense (FPP), Object Substitution (OS) or Imagining Absent Objects (IAO) Behaviors Per 5 Minutes



Note: The open circle represents prompted pretend play behaviors. The closed circle represents independent pretend play behaviors.

Figure 8

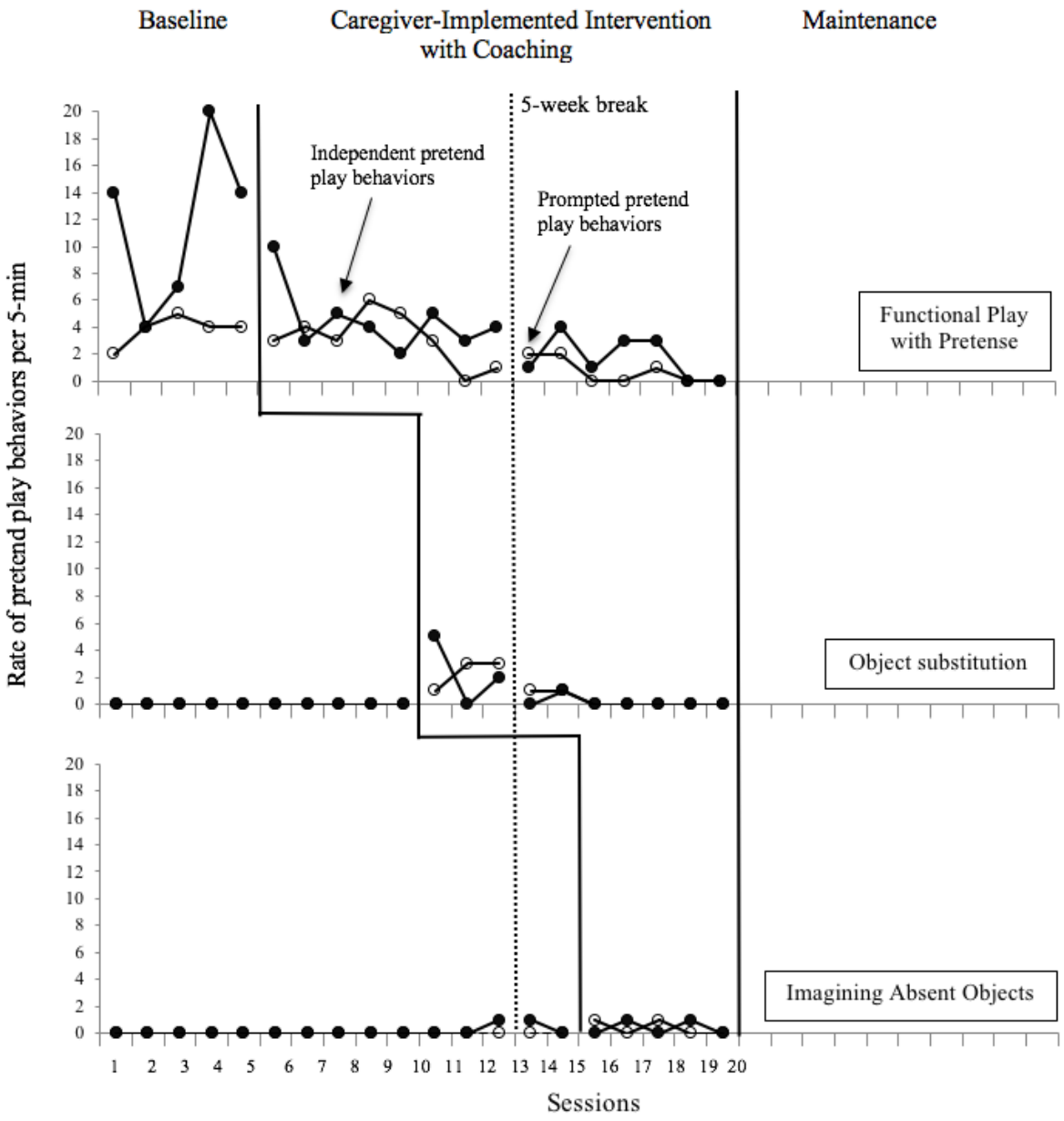
James (Focal Child of Triad 2)'s Rate of Prompted and Independent Functional Play with Pretense (FPP), Object Substitution (OS) or Imagining Absent Objects (IAO) Behaviors Per 5 Minutes



Note: The open circle represents prompted pretend play behaviors. The closed circle represents independent pretend play behaviors.

Figure 9

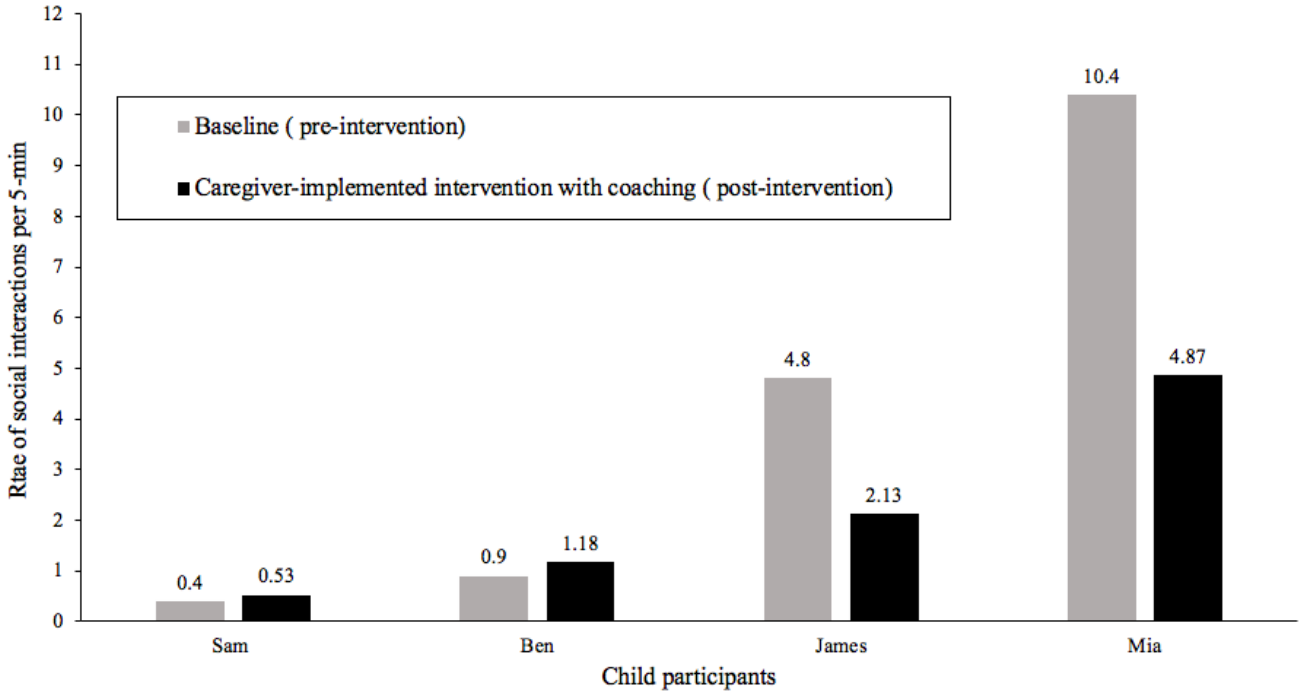
Mia (Sibling of Triad 1)'s Rate of Prompted and Independent Functional Play with Pretense (FPP), Object Substitution (OS) or Imagining Absent Objects (IAO) Behaviors Per 5 Minutes



Note: The open circle represents prompted pretend play behaviors. The closed circle represents independent pretend play behaviors.

Figure 10

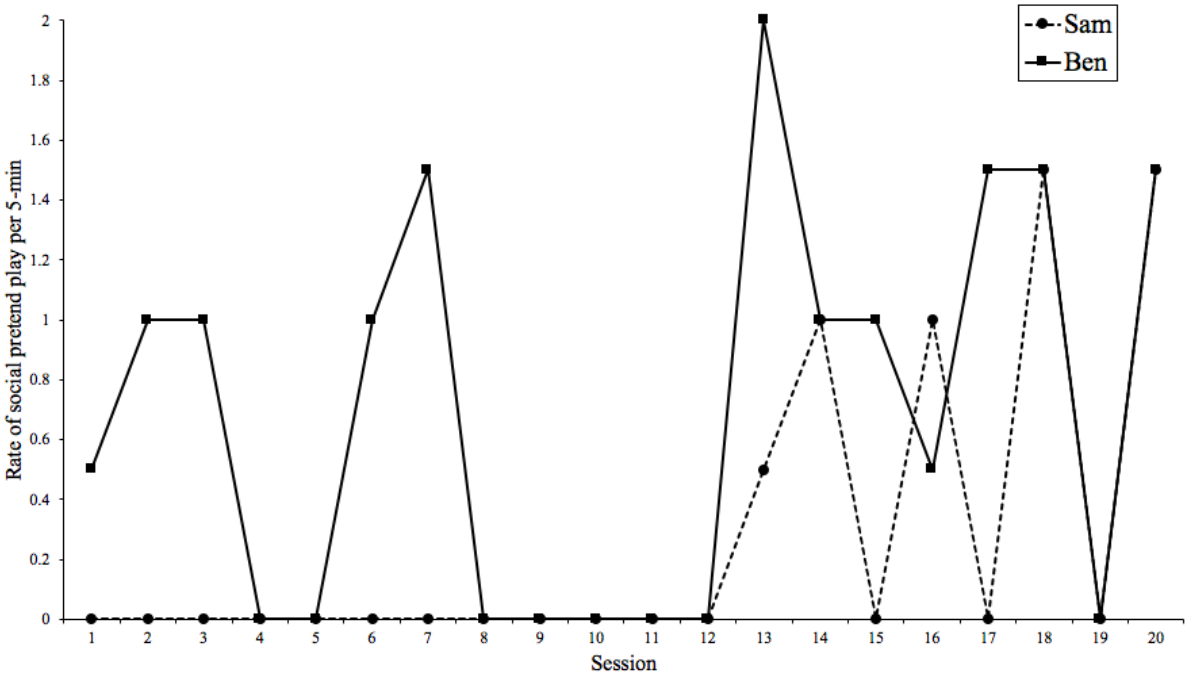
Sam (Focal Child of Traid 1), Ben (Sibling of Traid 1), James (Focal Child of Traid 2), and Mia (Sibling of Traid 2)'s Rate of Social Interactions During Baseline Condition (Pre-Intervention) and Caregiver-Implemented Intervention with Coaching Condition (Intervention)



Note. Only data in baseline condition and caregiver-implemented intervention with coaching condition was included. Data in maintenance condition was not included because maintenance data was only collected for Sam and Ben (children of Triad 1).

Figure 11

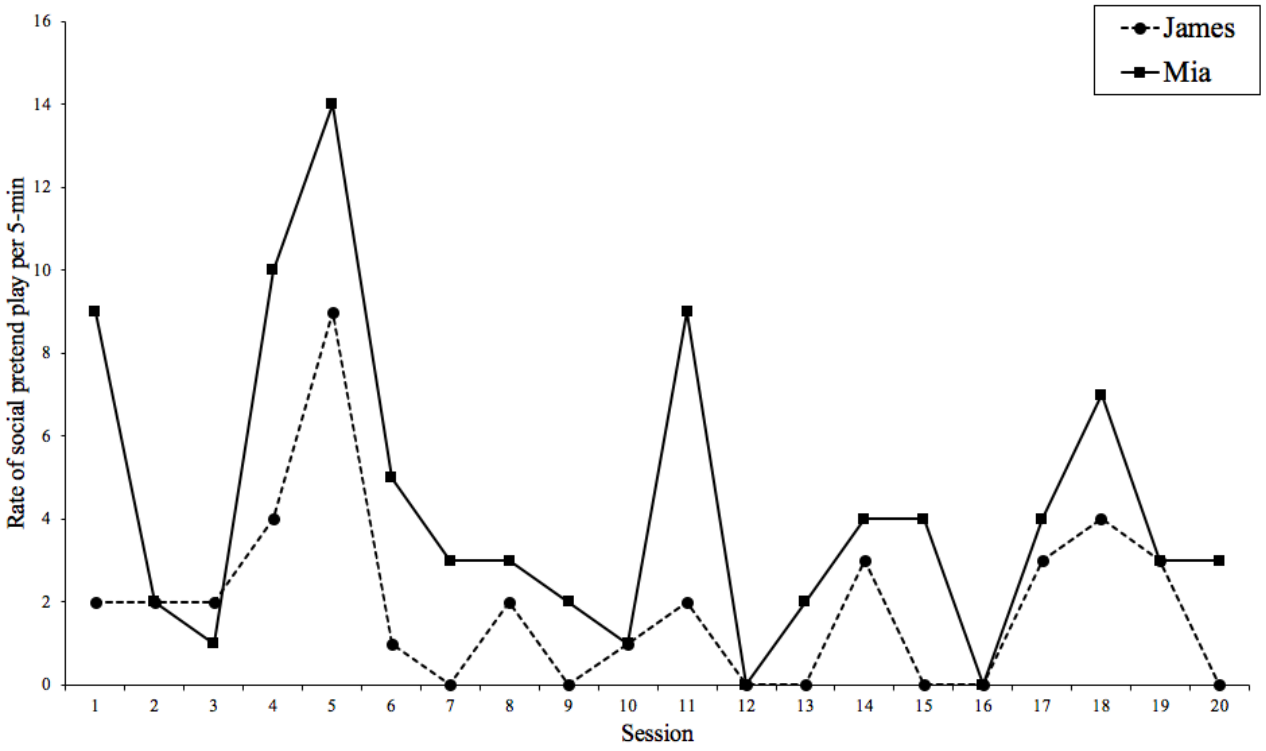
Sam (Focal Child of Triad 1) and Ben (Sibling)'s Rate of Social Pretend Play During Baseline Condition (Pre-Intervention) and Caregiver-Implemented Intervention with Coaching Condition (Intervention)



Note: Baseline condition = Session 1 – 5; Caregiver-implemented intervention with coaching condition = Session 6 – 20.

Figure 12

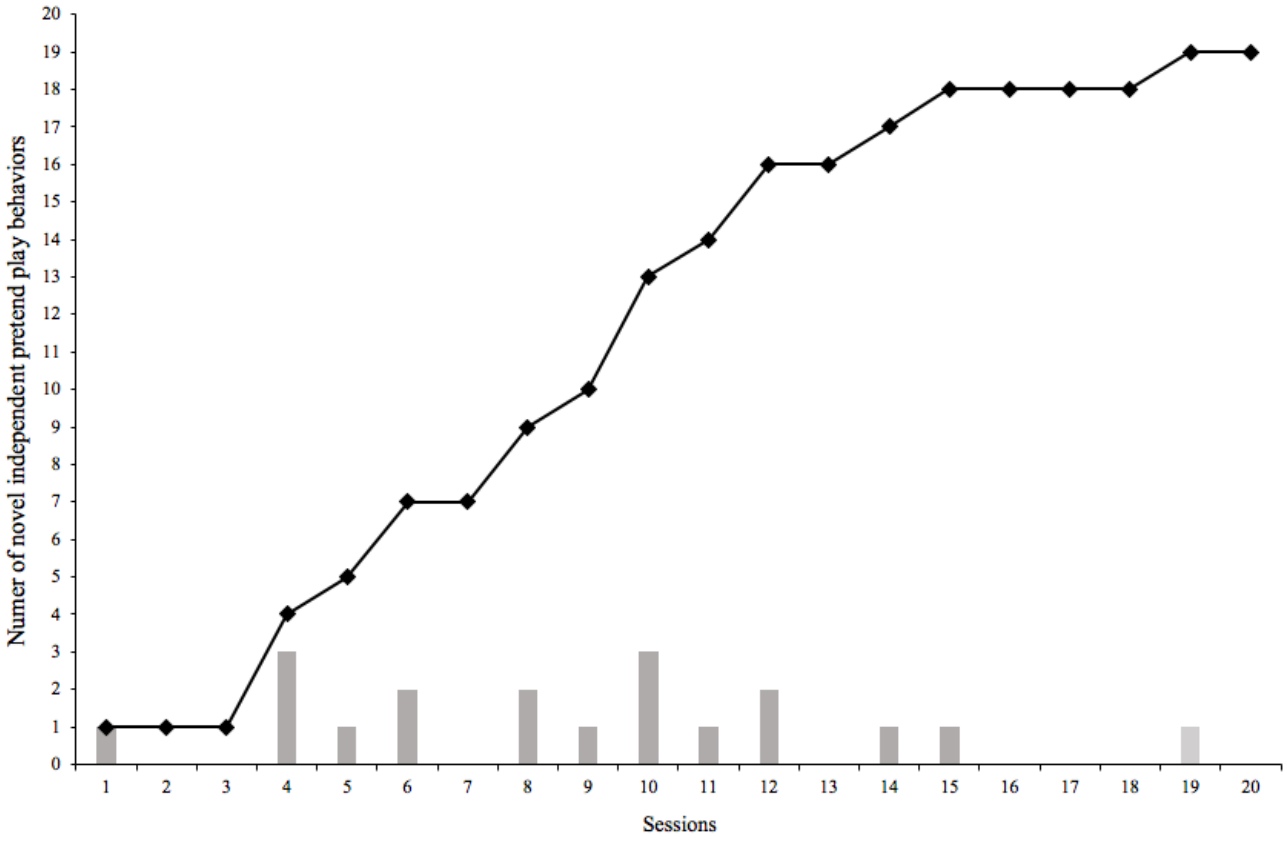
James (Focal Child of Triad 1) and Mia (Sibling)'s Rate of Social Pretend Play During Baseline Condition (Pre-Intervention) and Caregiver-Implemented Intervention with Coaching Condition (Intervention)



Note: Baseline condition = Session 1 – 5; Caregiver-implemented intervention with coaching condition = Session 6 – 20.

Figure 13

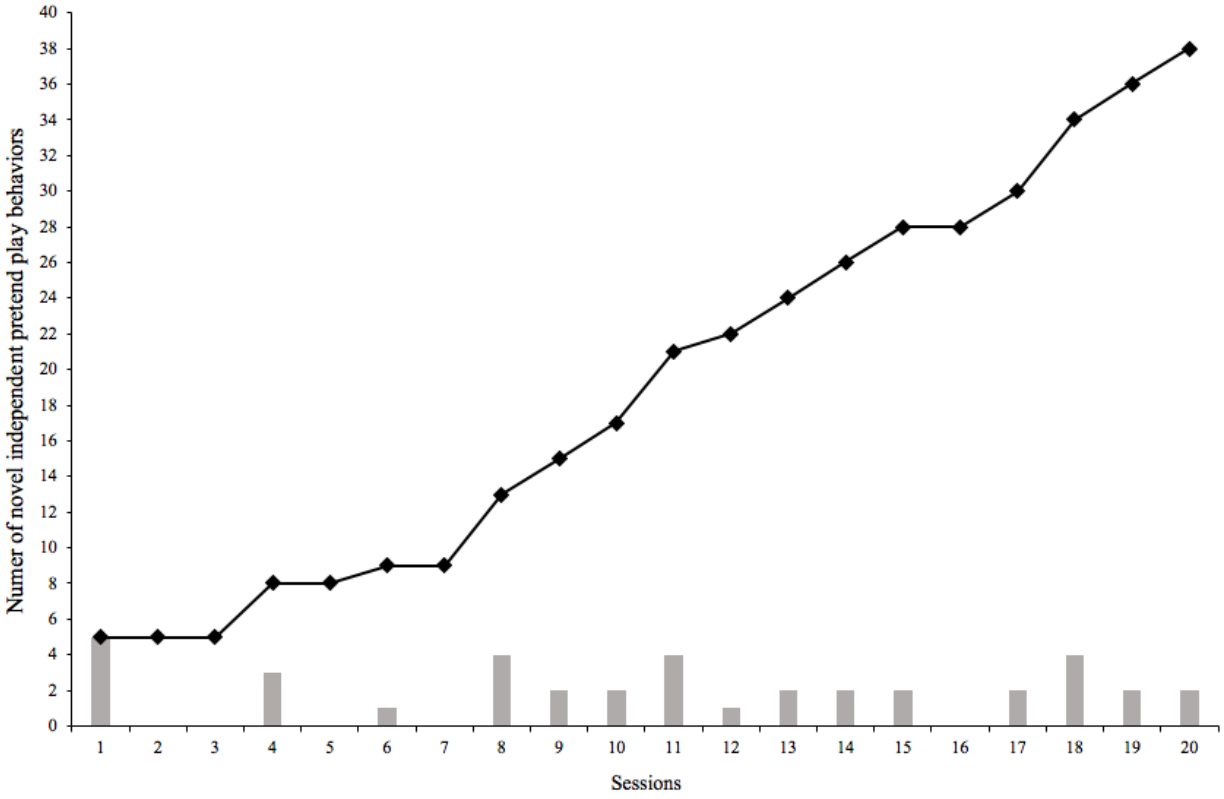
Sam (Focal Child of Triad 1)'s Demonstration of Novel Independent Pretend Play Behaviors During Baseline Condition (Pre-Intervention) and Caregiver-Implemented Intervention with Coaching Condition (Intervention) Each Session



Note: Baseline condition = Session 1 – 5; Caregiver-implemented intervention with coaching condition = Session 6 – 20. Novel independent pretend play = new behaviors that were not present during baseline sessions. The bar graph represents the number of novel independent pretend play behaviors demonstrated per session. The line graph represents cumulative records of the number of novel independent pretend play behaviors demonstrated across sessions.

Figure 14

James (Focal Child of Triad 2)'s Demonstration of Novel Independent Pretend Play Behaviors During Baseline Condition (Pre-Intervention) and Caregiver-Implemented Intervention with Coaching Condition (Intervention) Each Session



Note: Baseline condition = Session 1 – 5; Caregiver-implemented intervention with coaching condition = Session 6 – 20. Novel independent pretend play = new behaviors that were not present during baseline sessions. The bar graph represents the number of novel independent pretend play behaviors demonstrated per session. The line graph represents cumulative records of the number of novel independent pretend play behaviors demonstrated across sessions.

Appendices

Appendix A: Screening Form

General Information

(1) Do you have a 3-5-year-old child with a diagnosis of Autism Spectrum Disorders?
- If Yes: Move on to Q2
- If No: This is the end of the survey! Thank you for your time!

(2) Are you interested in learning new ways to play with your child with ASD?
- If Yes: Move on to Q3
- If No: This is the end of the survey! Thank you for your time!

(3) Does your child with ASD have a sibling?
- If Yes: Move to Q4
- If No: This is the end of the survey! Thank you for your time!

(4) Would your child's sibling be interested in playing more with their sibling with ASD?

About the Sibling

(5) Does your child (the sibling) have a disability?

(6) How old is your child (sibling)?

About the Child with ASD's play behavior

(7) What does your child with ASD's play look like now? (Where 1 = rarely, 2 = sometimes, 3 = always]
- My child plays with objects/toys appropriately (e.g., completing puzzles, coloring with crayons playing with play dough, playing with Legos, driving toy car back and forth etc.)
- My child engages in pretend play/imaginative play (e.g., role play – play superheroes/playhouse; dramatic play –cook food with the kitchen set; uses a box as a hat; pretend to drive an imaginary car).
- My child plays near their sibling.
- My child plays near their sibling using the same/similar toys.
- My child plays collaboratively with their sibling.

(8) Is your child with ASD able to imitate at least five common actions with objects?

(9) Would you be willing to record a 5-min video of your child with ASD playing at home? (Note: If Yes - you will receive more information about the content and format)

(10) What is the best way to reach out to you? (i.e., Email, phone, text)
- Please provide your contact information. If you don't not want the researcher to contact you, please indicate so in your response.

Appendix B: Sample Packet

UNIVERSITY of WASHINGTON

COLLEGE OF EDUCATION

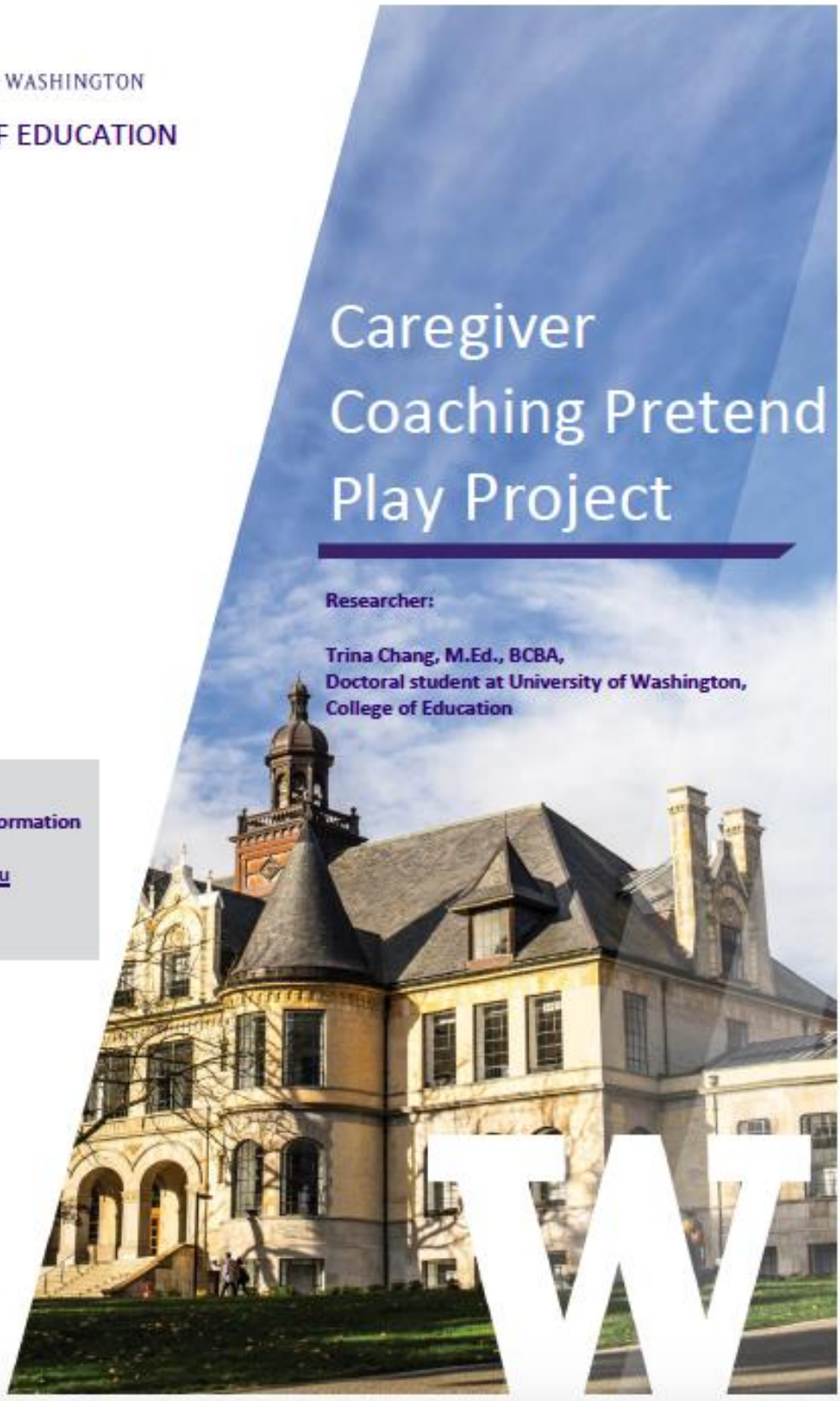
Caregiver Coaching Pretend Play Project

Researcher:

Trina Chang, M.Ed., BCBA,
Doctoral student at University of Washington,
College of Education

Researcher Contact Information

Email: chc0217@uw.edu
Phone: 253-320-6227



COLLEGE OF EDUCATION

Video Recording Schedule

Ideally, you'd want to build a play routine for your children. This means that you set aside a specific time to play with your children. A predictable schedule will help children know what to expect during the day☺

You will record five videos of you playing with your children on the week of June 7th and the week of June 14th.

Each video will always be 10-min.

On the day of recording, I will send a brief text message to you as a reminder.
I understand life happens, so if you are not able to follow the schedule, that's totally OK. But please let me know so that we can make the schedule work for you.

How to record videos

Set up the video-recording device

- Set the ipod touch on the tripod and make sure both you and your children are in the screen. Make sure the ipod touch is charged☺

Set up the play area & toys to include

- Have all the selected toys (see list below) ready and laid out in the play area
- Here is a list of toys that you will always include:
  (1) **Baby doll set** (i.e., baby dolls, crib, bathtub, soap, highchair); (2) **Toy food** (i.e., donuts, hotdog, fruits, veggies, pizza, ice cream, cake etc.); (3) **Kitchen toy set** (i.e., utensils, cups, plates, bowels, cookware, cutting board, knife, tea pot sets, skillets & kitchen with sink, stove and oven); (4) **Vehicles** (i.e., bus, trucks, cars, food truck, airplanes etc.); & (5) **Stuffed animals & small animals**; & (6) **Duplos, Magna-tiles and assorted objects** (i.e., beads, paint brushes)

- Review the Handouts in the Green Folder

To begin and end the play session

- To begin the play session, you will say, *"Let's play"*. To end the play session, you will say, *"We're all done now. You can find something else to play with!"*
- You may pause the video to attend to your children's personal care needs or if your child leaves the space.
- You should also end the filming if your child becomes upset for over 5 minutes, leaves the area and refuses to come back, engages in aggressive or dangerous behavior

COLLEGE OF EDUCATION

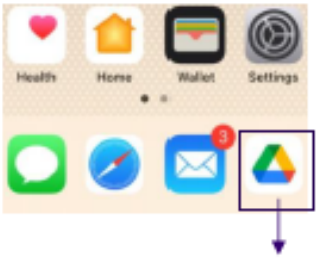
How to upload videos directly from the ipod touch

Videos of you and your children will be saved in s secure server, called the UW Google Drive, and will not be published online or in any social media platform. You and your children's names will be kept confidential as well.
Below, please follow the steps to upload the videos directly from the ipod touch. You will need to connect to WIFI before uploading the videos.

*Passcode to access the ipod touch: **1234**

If you got locked out or have trouble accessing the ipod touch, feel free to text or email me. I am more than happy to trouble shoot with you.

- Step 1: Find the Google Drive app on the home screen of the ipod touch (see the picture on the right)



- Step 2: In the Google Drive app, make sure you log into your Gmail account using the email address you provided (*You will only need to do this the first time you upload the video)*

- Step 3: Open the Google Drive app
  → Click on the "File" icon in the bottom right of the page
  → On the top right the page, click on the "Shared drives" icon
  → Find and click on the drive/folder named, *"Caregiver Pretend Play Project 01"*

- Step 4: In the *"Caregiver Pretend Play Project 01"* folder, click on the "+" icon in the bottom right of the page
  → Click on "upload" and then select "Photos and Videos"
  → In your album, select the video you want to upload and hit "upload" on the top right of the page
  → When you see the prompt "All uploads have completed", it means that the video has been uploaded to the folder successfully

Thank you for being part of this project! I look forward to working more with you and your children ☺

UNIVERSITY of WASHINGTON
COLLEGE OF EDUCATION

Object Substitution- Handout 1

What is "Object Substitution"?

Handout 1 talks about definition and examples of "Object Substitution"

We will learn three types of pretend play strategies. During our second training together, we are going to focus on the second play strategy: ***Object Substitution***

WHAT is "Object Substitution"?

Object Substitution is when children use an object as if it were something else.

WHY is it important?

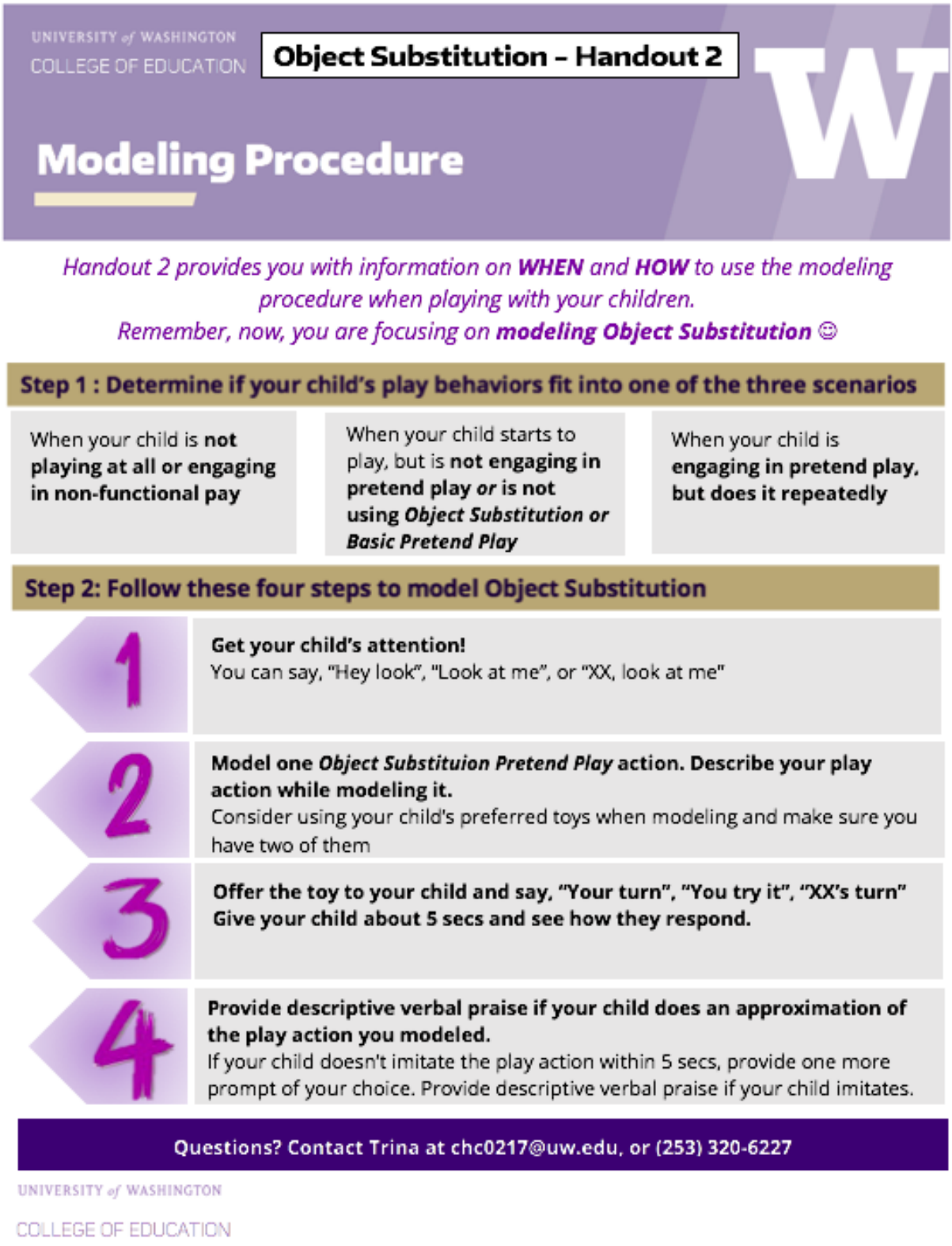
Object Substitution supports children as they develop their pretend play skills. It provides children with unique opportunities to engage in problem-solving when they don't have the exact toys they want to play with, which in term build up their creativity and imagination.

What are some EXAMPLES of Object Substitution?

- Using XXX (i.e., blocks, Legos) as food to feed the baby/stuffed animals; Using a box as a bed for the baby/stuffed animals
- Using a bowl/pan as a chef hat; Using popsicle stick as a knife to cut fruits/veggies; Using XXX (i.e., blocks, Legos) as food for cooking/eating
- Using a toy bathtub as garbage can to throw away leftovers or burnt food
- Using XXX (i.e., blocks, Legos, boxes) as a car/airplane and driving the car/flying the airplane
- Using blocks as kids and pick them up with school bus

Questions? Contact Trina at chc0217@uw.edu, or (253) 320-6227

UNIVERSITY of WASHINGTON
COLLEGE OF EDUCATION



UNIVERSITY of WASHINGTON
COLLEGE OF EDUCATION

Object Substitution – Handout 2

Modeling Procedure

*Handout 2 provides you with information on **WHEN** and **HOW** to use the modeling procedure when playing with your children.*
*Remember, now, you are focusing on **modeling Object Substitution** ☺*

Step 1 : Determine if your child's play behaviors fit into one of the three scenarios

When your child is **not playing at all or engaging in non-functional pay**

When your child starts to play, but is **not engaging in pretend play *or* is not using *Object Substitution or Basic Pretend Play***

When your child is **engaging in pretend play, but does it repeatedly**

Step 2: Follow these four steps to model Object Substitution

1. **Get your child's attention!**
   You can say, "Hey look", "Look at me", or "XX, look at me"
2. **Model one *Object Substituion Pretend Play* action. Describe your play action while modeling it.**
   Consider using your child's preferred toys when modeling and make sure you have two of them
3. **Offer the toy to your child and say, "Your turn", "You try it", "XX's turn" Give your child about 5 secs and see how they respond.**
4. **Provide descriptive verbal praise if your child does an approximation of the play action you modeled.**
   If your child doesn't imitate the play action within 5 secs, provide one more prompt of your choice. Provide descriptive verbal praise if your child imitates.

Questions? Contact Trina at chc0217@uw.edu, or (253) 320-6227

UNIVERSITY of WASHINGTON
COLLEGE OF EDUCATION

UNIVERSITY of WASHINGTON
COLLEGE OF EDUCATION

Object Substitution – Handout 3

Useful Tips to Play with Your Children

Handout 3 provides some useful tips when playing with your children

Research has shown that supporting your children's pretend play is important for their development in many ways! It also provides a great context for your children to build positive relationships with each other. Below, see some useful tips that you can use while playing with your children.

Do what your child is doing and describe the play action

This will help you get your child's attention and further build positive play interaction with your child!

For example:

If your child is feeding a baby doll with XXX, you can imitate your child and say, "we're feeding the baby".

Praise your child if he/she is playing nicely

Reinforcing your child's play will encourage your child to play more! You can also consider pair praise with other things your child enjoys such as high-fives or rubbing on the back.

For example:

If you see your child is feeding a baby doll, you can say, "Good job feeding the baby".

Make sure to attend to both children when playing with them

This is to make sure both of your children receive similar amount of attention.

For example:

When you copy one child's play, give praise or model play action, next time, you can turn to your other child and do the same.

Questions? Contact Trina at chc0217@uw.edu, or (253) 320-6227

UNIVERSITY of WASHINGTON
COLLEGE OF EDUCATION

UNIVERSITY of WASHINGTON
COLLEGE OF EDUCATION

Object Substitution – Handout 4

Getting Ready to Play and Have Fun with Your Children

Handout 4 is about getting ready to play with your children

You have learned about the definition and examples of Object Substitution (Handout 1), as well as how and when to use the modeling procedure (Handout 2) during play.
Now, let's look up tips for setting up a context for pretend play and how to support both of your children using the modeling procedure.

Before playing

Setting up the play area!

- Make sure that all of the toys and play materials selected are ready
- Set up the play area and lay out all the selected toys

When you begin

Start playing with your children!

- Provide a cue "Let's play! "to let your children know it's time to play
- Watch your children play for about 15-20 secs and see what toys they are using
- Imitate what your child is doing and praise your child 2-3 times
- Make sure you take turns imitating both of your children's play

After watching your children playing for a bit

Supporting your children during play!

- Make sure you provide the same amount of attention to both children
- Model *Object Substitution* & *Basic Pretend Play* for your children using the modeling procedure (see Handout 2)
- Take turns modeling for your children. If your child is playing and doesn't need modeling support, imitate what your child is doing and give praise

Questions? Contact Trina at chc0217@uw.edu, or (253) 320-6227

UNIVERSITY of WASHINGTON
COLLEGE OF EDUCATION

Appendix C: One-Page Handout (Baseline)

UNIVERSITY of WASHINGTON
COLLEGE OF EDUCATION

Getting Ready to Play and Have Fun with Your Children

This handout is about getting ready to play with your children

Play provides opportunities for children to explore the world around them and develop many important skills. It also offers a great, natural context for you to build positive interactions with your children and for your children to build positive relationships with each other. Now, let's look at tips for setting up a context for playing with your children.

Before playing

Setting up the play area!

- Include some of your children's favorite toys to keep your children interested
- Make sure that all of the toys are ready
- Set up the play area and lay out all the selected toys

When you begin

Start playing with your children!

- Provide a cue "Let's play! "to let your children know it's time to play
- Sit near your children when playing with them
- Watch what your child is doing and what toys they are using for about 15-20 secs
- Do what your child is doing. Describe the play actions and praise your child 2-3 times (*if your child drives a truck, you can drive a truck and say "driving a truck"*)
- Make sure you take turns imitating both children's play behaviors

After watching your children playing for a bit

Supporting your children during play!

- Make sure you provide the same amount of attention to both children
- Do what your child is doing and say what they say. Keep playing with your children and follow their lead.
- Praise your child's play (*"Good job driving the truck" "I like how you drive the truck"*)

Questions? Contact Trina at chc0217@uw.edu, or (253) 320-6227

Appendix D

Caregiver Behavior – Data Sheet

Coder Initials: _____ (Primary/Secondary Coder) Coding date: _____

CAREGIVER ID: _____ Phase: BL / Int 1 / Int 2 / Int 3 / Main Session Date: _____
Coding Start Time: _____ Coding End Time: _____

Step	Caregiver Behavior	Trials					
		1	**2**	**3**	**4**	**5**	**6**
1	The caregiver got the child's attention (e.g., Hey, look!) *Note: To code as a correct implementation, the caregiver would need to give an explicit cue to make sure he/she had the child's attention.* *Examples: "Hey, look!" "Look at me!" "XX, look at me!"* *Non-example: only said the child's name*	☐ Correct ☐ Incorrect ☐ No Attempt	☐ Correct ☐ Incorrect ☐ No Attempt	☐ Correct ☐ Incorrect ☐ No Attempt	☐ Correct ☐ Incorrect ☐ No Attempt	☐ Correct ☐ Incorrect ☐ No Attempt	☐ Correct ☐ Incorrect ☐ No Attempt
1.1	Was the attention toward the focal child or the sibling?	☐ FC ☐ S	☐ FC ☐ S	☐ FC ☐ S	☐ FC ☐ S	☐ FC ☐ S	☐ FC ☐ S
1.2	The caregiver initiated the trial under 1 of the 3 conditions ① Child is not playing or is engaging in non-functional play ② Child is playing, but is not engaging in any pretend play behaviors or is engaging in non-	☐ Correct ☐ Incorrect	☐ Correct ☐ Incorrect	☐ Correct ☐ Incorrect	☐ Correct ☐ Incorrect	☐ Correct ☐ Incorrect	☐ Correct ☐ Incorrect

	targeted type of pretend play ③ Child is engaging in repetitive pretend play						
Step	**Caregiver Behavior**	**Trials**					
		1	**2**	**3**	**4**	**5**	**6**
2	The caregiver modeled pretend play behavior with appropriate materials	☐ Correct ☐ Incorrect ☐ No Attempt	☐ Correct ☐ Incorrect ☐ No Attempt	☐ Correct ☐ Incorrect ☐ No Attempt	☐ Correct ☐ Incorrect ☐ No Attempt	☐ Correct ☐ Incorrect ☐ No Attempt	☐ Correct ☐ Incorrect ☐ No Attempt
2.1	Which type of pretend play did the caregiver model? ① Functional play with pretense (FPP) ② Object substitution (OS) ③ Imagining absent objects (IAO)	☐ ① ☐ ② ☐ ③	☐ ① ☐ ② ☐ ③	☐ ① ☐ ② ☐ ③	☐ ① ☐ ② ☐ ③	☐ ① ☐ ② ☐ ③	☐ ① ☐ ② ☐ ③
3	The caregiver described the action while modeling it	☐ Correct ☐ Incorrect ☐ No Attempt	☐ Correct ☐ Incorrect ☐ No Attempt	☐ Correct ☐ Incorrect ☐ No Attempt	☐ Correct ☐ Incorrect ☐ No Attempt	☐ Correct ☐ Incorrect ☐ No Attempt	☐ Correct ☐ Incorrect ☐ No Attempt
4	The caregiver provided appropriate materials and said "your turn" as a prompt for the child to imitate the modeled action	☐ Correct ☐ Incorrect ☐ No Attempt	☐ Correct ☐ Incorrect ☐ No Attempt	☐ Correct ☐ Incorrect ☐ No Attempt	☐ Correct ☐ Incorrect ☐ No Attempt	☐ Correct ☐ Incorrect ☐ No Attempt	☐ Correct ☐ Incorrect ☐ No Attempt
5	The caregiver provided an additional prompt once (e.g., hand-over-hand, verbal prompt, model prompt) *if the child DID NOT imitate the play action within 5-sec* *Note: If the child imitated the play action within 5-sec, mark as N/A and go directly to step 6*	☐ Correct ☐ Incorrect ☐ No Attempt ☐ N/A	☐ Correct ☐ Incorrect ☐ No Attempt ☐ N/A	☐ Correct ☐ Incorrect ☐ No Attempt ☐ N/A	☐ Correct ☐ Incorrect ☐ No Attempt ☐ N/A	☐ Correct ☐ Incorrect ☐ No Attempt ☐ N/A	☐ Correct ☐ Incorrect ☐ No Attempt ☐ N/A

Step	Caregiver Behavior	Trials					
		1	**2**	**3**	**4**	**5**	**6**
6	The caregiver provided descriptive verbal praise to the child	☐ Correct ☐ Incorrect ☐ No Attempt ☐ N/A	☐ Correct ☐ Incorrect ☐ No Attempt ☐ N/A	☐ Correct ☐ Incorrect ☐ No Attempt ☐ N/A	☐ Correct ☐ Incorrect ☐ No Attempt ☐ N/A	☐ Correct ☐ Incorrect ☐ No Attempt ☐ N/A	☐ Correct ☐ Incorrect ☐ No Attempt ☐ N/A
Total # of steps possible *Note: Excluding steps that are coded as N/A*		_____ steps	_____ steps	_____ steps	_____ steps	_____ steps	_____ steps
Totals		Correct: _____ Incorrect: _____ No Att.: _____	Correct: _____ Incorrect: _____ No Att.: _____	Correct: _____ Incorrect: _____ No Att.: _____	Correct: _____ Incorrect: _____ No Att.: _____	Correct: _____ Incorrect: _____ No Att.: _____	Correct: _____ Incorrect: _____ No Att.: _____
Percentage correct of the modeling procedure *# of steps coded as correct / # of steps possible*		( ) / ( ) = _____ %	( ) / ( ) = _____ %	( ) / ( ) = _____ %	( ) / ( ) = _____ %	( ) / ( ) = _____ %	( ) / ( ) = _____ %

Note: N/A = Not applicable; F = Focal Child; S = Sibling

Percentage Correct of the Modeling Procedure			
Overall	Functional Play with Pretense (FPP)	Object Substitution (OS)	Imagining Absent Objects (IAO)
_____ (# of steps coded as correct) /_____ (# of steps possible) X100% = _____ %	_____ (# of steps coded as correct) /_____ (# of steps possible) X100% = _____ %	_____ (# of steps coded as correct) /_____ (# of steps possible) X100% = _____ %	_____ (# of steps coded as correct) /_____ (# of steps possible) X100% = _____ %

Appendix E

Child Behavior – Data Sheet

Coder Initials: ___________ (Primary/Secondary Coder) Coding date: ___________

CHILD ID: ___________ Phase: BL / Int 1 / Int 2 / Int 3 / Main Session Date: ___________
Coding Start Time: ___________ Coding End Time: ___________

Events	Timestamp	Social Interaction Between Siblings	Pretend Play Behaviors	Social Pretend Play	Independence
		☐ Yes ☐ No	☐ Function play with pretense (FPP) ☐ Object Substitution (OS) ☐ Imagining absent objects (IAO) ☐ Assigning absent attributes (AAA) ☐ N/A	☐ Yes ☐ No *Mark as Yes if the positive social interaction is relevant to the pretend play behaviors*	☐ Prompted ☐ *Modeled* ☐ Independent ☐ N/A
		☐ Yes ☐ No	☐ Function play with pretense (FPP) ☐ Object Substitution (OS) ☐ Imagining absent objects (IAO) ☐ Assigning absent attributes (AAA) ☐ N/A	☐ Yes ☐ No *Mark as Yes if the positive social interaction is relevant to the pretend play behaviors*	☐ Prompted ☐ *Modeled* ☐ Independent ☐ N/A
		☐ Yes ☐ No	☐ Function play with pretense (FPP) ☐ Object Substitution (OS) ☐ Imagining absent objects (IAO) ☐ Assigning absent attributes (AAA) ☐ N/A	☐ Yes ☐ No *Mark as Yes if the positive social interaction is relevant to the pretend play behaviors*	☐ Prompted ☐ *Modeled* ☐ Independent ☐ N/A

Events	Timestamp	Social Interactions Between Siblings	Pretend Play Behaviors	Social Pretend Play	Independence
		□ Yes □ No	□ Function play with pretense (FPP) □ Object Substitution (OS) □ Imagining absent objects (IAO) □ Assigning absent attributes (AAA) □ N/A	□ Yes □ No *Mark as Yes if the positive social interaction is relevant to the pretend play behaviors*	□ Prompted □ *Modeled* □ Independent □ N/A
		□ Yes □ No	□ Function play with pretense (FPP) □ Object Substitution (OS) □ Imagining absent objects (IAO) □ Assigning absent attributes (AAA) □ N/A	□ Yes □ No *Mark as Yes if the social interaction is relevant to the pretend play behaviors*	□ Prompted □ *Modeled* □ Independent □ N/A
		□ Yes □ No	□ Function play with pretense (FPP) □ Object Substitution (OS) □ Imagining absent objects (IAO) □ Assigning absent attributes (AAA) □ N/A	□ Yes □ No *Mark as Yes if the positive social interaction is relevant to the pretend play behaviors*	□ Prompted □ *Modeled* □ Independent □ N/A
		□ Yes □ No	□ Function play with pretense (FPP) □ Object Substitution (OS) □ Imagining absent objects (IAO) □ Assigning absent attributes (AAA) □ N/A	□ Yes □ No *Mark as Yes if the positive social interaction is relevant to the pretend play behaviors*	□ Prompted □ *Modeled* □ Independent □ N/A

Events	Timestamp	Social Interactions Between Siblings	Pretend Play Behaviors	Social Pretend Play	Independence
		☐ Yes ☐ No	☐ Function play with pretense (FPP) ☐ Object Substitution (OS) ☐ Imagining absent objects (IAO) ☐ Assigning absent attributes (AAA) ☐ N/A	☐ Yes ☐ No *Mark as Yes if the social interaction is relevant to the pretend play behaviors*	☐ Prompted ☐ *Modeled* ☐ Independent ☐ N/A
Totals					

Total # of Events: _____

	Overall Totals	Rate (per 5 minutes)	IOA Formula: # of agreements / # of agreements + disagreements
# of social interactions		_____ / _____ = ____	
# of prompted pretend play		_____ / _____ = _____	
# of independent pretend play		_____ / _____ = _____	

Rate of Individual types of Pretend Play (per 5 minutes)				
	Functional Play with Pretense (FPP)	Object Substitution (OS)	Imagining Absent Objects (IAO)	Assigning Absent Attributes (AAA)
# of prompted pretend play	_____ / _____ = _____	_____ / _____ = _____	_____ / _____ = _____	_____ / _____ = _____
# of independent pretend play	_____ / _____ = _____	_____ / _____ = _____	_____ / _____ = _____	_____ / _____ = _____

Appendix F

Caregiver Training Session Fidelity Checklist

Caregiver ID: _____ Session Date: _____ Phase: Caregiver Training 1 / 2 / 3

Fidelity Rater Initials: _____ Fidelity rated date: _____

**** Instructions: Score Yes, No, or N/A (when applicable) for each item****

Elements of Caregiver Training	Y	N	N/A	Notes
1. A Coaching packet was sent before each caregiver coaching session				
2. An introduction of the importance of pretend play and the rationale for teaching pretend play				
3. A description of the definition of the targeted type of pretend play (Note: Session 1 = functional play with pretense; Session 2 = object substitution, and Session 3 = imagining absent objects)				
4. Provide examples and non-examples of the targeted type of pretend play: both written examples and video examples				
5. A description or review of the 4-step modeling procedure				
6. A description of the contingent imitation and verbal praise				
7. Provide opportunities for practice: role-play of the 4-step modeling procedure of the targeted pretend play, contingent imitation and verbal praise				
8. Provide feedback when observing the caregiver role-play				
9. Work with the caregiver to brainstorm play ideas and targeted pretend play behaviors based on the child's preferred activities or toys				
10. Opportunities and time for the caregiver to ask questions				

Appendix G

Email Feedback Fidelity Checklist

Caregiver ID: _____ Session Date: _____ Phase: Int1/ Int2 / Int 3

Fidelity Rater Initials: _____ Fidelity rated date: _____

**** Instructions: Score Yes, No, or N/A (when applicable) for each item****

Elements of Feedback	**Y**	**N**	**N/A**	**Notes**
Prior to Session				
1. A brief text message was sent to the caregiver on the day of recording/caregiver-implemented intervention as a reminder				
Opening Statement				
2. Begin with friendly and positive statement. *Examples: "Thank you for sending me the video. It was fun to see you playing with your kids."*				
Supportive Feedback				
3. Provide supportive feedback for (a) the caregiver's correct completion of the 3-step modeling procedure AND (b) include 2-3 written examples and 1 video example of the caregiver's correct use of the modeling procedure *Examples: "You are really doing a great job using the modeling procedure. I saw you….". "Wonderful to watch; you used the modeling procedure for (the child) when she/he (behavior)."*				
Corrective Feedback				
4. Provide one or two suggestions for improvements, including missed opportunities to use the modeling procedure or incorrect use of the modeling procedure *Examples: "When you used the modeling procedure with (the child), you did well on (steps), but you missed (steps)". "Let's think about a few scenarios in which you may use the modeling procedure…"*				
Closing Statement				
5. Close with positive and encouragement statement *Examples: "It's always fun watching you play with your children. Thanks again for being part of this project"*				

Appendix H

Video Fidelity Checklist

Caregiver ID: _____ Session Date: _____ Phase: Baseline / Int1/ Int2 / Int 3 / Maintenance

Fidelity Rater Initials: _____ Fidelity rated date: _____

**** Instructions: Score Yes, No, or N/A (when applicable) for each item****

Elements of Procedural Fidelity Checklist	**Y**	**N**	**N/A**	**Notes**
Setting and Materials				
1. All pre-determined toy sets were visible and arranged (i.e., laid out) at the beginning of the session				
2. Only the caregiver, the focal child and the sibling were present				
3. There was no visible evidence of setting events (e.g. fatigue, illness, hunger etc.)				
Clear Beginning/Endings to session				
4. To begin each session, the caregiver said, “Let’s play!”				
5. To end the session, the caregiver said, “We’re done now. You can find something else to play with.”				
Length of the Session				
6. The session lasted for at least 5-min (triad 2) or 10-min (triad 1) a. Session start time: b. Session end time:				

Appendix I

Social Validity Survey

Dear Family,

Thank you for your time and participation in the Pretend Play Project. We've come to the end of this project, and I have learned so much from you and your children. In this survey, I am hoping to learn more about your experience participating in this project. It should take about XX minutes to complete this survey. Your responses will be kept confidential and will not be linked to your name or your children's names. If you have any questions at any point, please feel free to contact me at chc0217@uw.edu.

Part I - Your Children's Background Information

About Your Child with ASD

Please answer the following questions about your child with ASD

1. When was your child born? (MM/YY)
2. Which group most accurately describes your child's race?
   - White or European American; American Indian / Alaska Native; Asian; Black or African American; Native Hawaiian or other Pacific Islander; Multi-racial; Other (Please describe: _____); I prefer not to answer
3. Is your child of Hispanic or Latino origin?
   - Yes; No; I prefer not to answer
4. Does your child have an Individualized Education Program (IEP)?
   - Yes; No; Not sure; I prefer not to answer
5. If Yes to Q5 - Does your child have a play-related IEP goal for the past school year (2020-2021)
   - Yes; No; Not sure
6. What early childhood special education services or therapies has your child received, or is receiving, through your school district or private agencies?
   - Speech and language therapy (SLP); Physical therapy (PT); Occupational therapy (OT); Applied Behavior Analysis (ABA); Other (Please describe: _____)

About Your Child with ASD's Sibling

Please answer the following questions about your child's sibling

1. When was your child (sibling) born? (MM/YY)
2. Does your child (sibling) have an Individualized Education Program (IEP)?
   - Yes; No; Not sure; I prefer not to answer

Part II - Caregiver Background Information

About Yourself

Please answer the following questions about yourself

1. What is your gender?
   - Male; Female; Non-Binary; Other
2. Which age group are you in?
   - Under 20; 20-29; 30-39; 40-49; Over 49; I prefer not to answer
3. What is the highest grade in school you have completed?
   - 8th grade or less; 1-3 years of high school; 12th grade, high school diploma, or GED; Vocational school/other non-college certificate; 1-3 years of college of Associates degree; College degree (B.A., B.S.); Master's degree (e.g., MA, MBA, MS); Professional degree (e.g., MD, JD, PhD); I prefer not to answer
4. Which group most accurately describes your *race*?
   - White or European American; American Indian / Alaska Native; Asian; Black or African American; Native Hawaiian or Other Pacific Islander; Multi-racial; Other; I prefer not to answer
5. Which group most accurately describes your *ethnicity*?
   - Hispanic or Latino; Not Hispanic or Latino
6. In total, how many people live in your home? (adults and children, respectively)
7. What languages do you or other caregivers use with your children at home? (Select all that applies)
   - English; French; Hindi; Portuguese; Spanish; Other (Please list: _____)

Part III - Caregiver's Experience with the Pretend Play Project

Part A - About Your Experience

1. Please tell us a little bit about your overall experience participating in this project (Where *"1"* = Strongly disagree; "5" = Strongly agree).
   a) Overall, I enjoyed my time participating in this project.
   b) The training and feedback I received throughout this project has helped increase my understanding of different types of pretend play and play strategies.
   c) The 4-step modeling procedure is easy to learn.
   d) I found the 4-step modeling procedure easy to use when playing with my kids.
   e) The pretend play skills (i.e., Basic Pretend Play, Object Substitution, Imaginative Play) is easy to learn.
   f) I found the pretend play skills (i.e., Basic Pretend Play, Object Substitution, Imaginative Play) easy to use when playing with my kids.
   g) I feel more confident about playing with my kids using the pretend play strategies I have learned throughout this project.

2. Please rate your experience participating in this project **based on your *satisfaction with the quality* of the trainings, coaching activities as well as training materials** (Where *"1"* = Not at all satisfied; *"5"* = Completely satisfied)
   a) How satisfied were you with the three training sessions?
   b) How satisfied were you with the three handout packets (green/yellow/blue folders)?

   c) How satisfied were you with the email feedback you received throughout this project?
3. Please rate your experience participating in this project **based on the usefulness of trainings, coaching activities and training materials** (Where *"1"* = Not at all useful; *"5"* = Extremely useful)
   a) How useful were the three training sessions?
   b) How useful were the three handout packets (green/yellow/blue folders)?
   c) How useful was the email feedback you received?
4. Do you think you will continue using the modeling procedure around pretend play with your kids? (Where *"1"* = Not at all likely; *"5"* = Very likely)
5. How likely are you to participate in this type of parent coaching in the future? (Where *"1"* = Not at all likely; *"5"* = Very likely)
6. If 3 or more to Q5 - What topics or areas would you be interested in receiving training and coaching?
7. Would you recommend this type of coaching and intervention to other parents?
8. Why or why not?

Part B - About Your Child with ASD's Play and Interactions with the Sibling

1. Have you observed any changes in your child's pretend play?
   - YES/NO
     - If Yes, please briefly describe the changes you have seen in your child's pretend play

2. Have you seen your child engaging in pretend play with other family members, with other kids or in different settings?
   - YES/NO
     - If Yes, please share with me 1-2 examples
3. Have you noticed any changes in your child's interactions with you or their sibling?
   - YES/NO
     - If Yes, please briefly describe the changes you have seen in your child's interactions
4. Is there anything else you would like to share about your experience participating in this project?

We have come to the end of the survey. Thank you so much for your time!