AN EXAMINATION OF PLAY BEHAVIORS IN YOUNG AT-RISK CHILDREN

Adrienne L. Schwabe
University of Minnesota
Lesley Craig Unkefer
Middle Tennessee State University

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Abstract

This study examined the effects that a multi-component intervention had on play behaviors and mean length of utterance (MLU) of eight Head Start children at risk for language delays and social skill development. The intervention consisted of three components: (a) a planning period included reading a story book that illustrated the play theme and use of the social pragmatic communication strategies, practice using vocabulary to be used in play, and choosing roles for the thematic activity; (b) a 10-minute play session in which the interventionist coached children to interact while they played with the thematic related toys; and (c) a brief reporting period in which children reviewed their use of social pragmatic strategies and specific vocabulary. Increases in complex play and MLU were observed from baseline to intervention for all children. The increases however, were not consistent among dyads.

Play is a natural environment for children's language development (Perlmutter & Burrell, 1995). It also offers an arena in which all facets of conversational dialogue can be extended (Berk & Winsler, 1995). Development theory conducted by Jean Piaget and Lev Vygotsky focus on play behaviors and how play influences all developmental domains. Jean Piaget designed three categories and stages of play: *practice play, symbolic play, and games with rules.* Practice play, is defined as sensori-motor and exploratory play based on physical activities (six months to two years); symbolic play, is pretend, fantasy and socio-dramatic play, involving the use of mental representations which is regarded as intellectual activity (two to six years) (Wood & Attfield, 2005). Finally, games with rules is from six to seven years upwards (Wood & Attfield, 2005). Games with rules provide practice in cooperation, as well as opportunities to build language skills (Riley & Jones, 2007). In addition to these categories and stages of play, Piaget stressed the importance of assimilation and accommodation as it relates to cognitive development (Zigler & Bishop-Josef, 2004). Assimilation is when a child is able to take new material and fit it into an already existing structure, where as accommodation is adjusting the structure in reaction to the newly incorporated material (Hughes, 1991). Play is the dominance of assimilation over accommodation (Hughes, 1991).

According to Piaget, play provides the child with a multitude of opportunities to interact with materials in the environment and construct his or her own knowledge about the world (Zigler & Bishop-Josef, 2004). Play can facilitate learning by exposing the child to new experiences and new possibilities for acting in and on the world (Wood & Attfield, 2005). The educator is an enabler and facilitator who responds to children's

initiatives and values their thinking processes and ongoing cognitive concerns (Wood & Attfield, 2005).

Lev Vygotsky's work emphasized the importance of how particular interactions with people – parents, teachers, peers- foster cognitive development (Zigler & Bishop-Josef, 2004). Vygotsky's zone of proximal development is a key factor in promoting play development as it is difficult for a child to learn alone and is best mastered if the child is guided by someone who is skilled at the task (Zigler & Bishop-Josef, 2004). As well, Vygotsky (1967) speculated that play builds mental structures through the use of signs and tools that promote language and thought development. Another key component of Vygotsky's work is scaffolding. Scaffolding is a strategy used when a teacher models the desired behavior or task and then gradually shifts the task to the child entirely. In each instance the teacher selects the level of support that best matches the child's abilities and momentary needs and then pulls back as the child acquires new social skills within his zone of proximal development (Berk & Winsler, 1995).

There are several ways to promote play development through language and literacy: peer-mediated strategies, adult-mediated strategies, toy selection and environmental considerations. Several of the above strategies have been used together to promote play development. Observations of children at play have pointed out the functional uses of literacy skills (paper handling, storytelling, and early attempts as reading and writing) which children incorporate into their play themes (Morrow & Rand, 1991). Morrow and Rand (1991) as well as Christie and Enz (1992) both found that adult involvement was quite effective in getting children to incorporate literacy into

dramatic play. Once children were taught to incorporate literacy materials into their play, they were quite capable of doing literacy play on their own (Christie & Enz, 1992).

Morrow & Rand (1991), conducted a study with a literacy adult-mediated intervention that contained one hundred seventy children participants from thirteen middle-class preschool and kindergarten classes. The participants were randomly assigned to one of four groups (1) paper, pencil, and books with adult guidance, (2) thematic materials with adult guidance, (3) thematic materials without adult guidance, and (4) traditional curriculum control group. Results indicated that groups one and two which both had an adult guidance component had a greater increase in literacy play behaviors than the latter two groups.

Christie and Enz (1992) conducted a study that looked at the effects of literacy play interventions on preschoolers' play patterns and literacy development. There were thirty-two 4- and 5-year-old children in one teacher's morning (AM) and afternoon (PM) preschool classes. The intervention consisted of a material plus adult involvement and a materials only treatment. The PM class received the materials only treatment. The AM class received the material plus adult involvement. Results indicated that the material plus adult involvement had a much more dramatic increase than the materials only group. Adult involvement appears to have promoted literacy-related play directly through modeling and suggestions.

Peer- mediated interventions take advantage of children's ability to learn social and communication skills from peers in the context of play (Craig-Unkefer & Kaiser, 2002). Some interventions use typical developing peers to increase play with the target child (Stanton-Chapman, Kaiser, & Wolery, 2006). Other interventions, such as Craig-

Unkefer & Kaiser (2002) paired children that both were considered at risk for early behavior problems as well as low language skills. In both cases peers were used to facilitate the development of play and social interactions. Peer tutoring and modeling have also both been used to increase play development (Wolery, 2005).

Adult mediated interventions include such things but are not limited to prompting, modeling, and increased assistance (Wolery, 2005). Wilcox-Herzog and Kontos (2001) found that it isn't the amount in which a teacher talks but rather the quality of what the teacher says that is important. Lindeman, Fox, and Redelheim (1993), found that prompting and praising reliably increased withdrawn subject's initiations with peers.

Lindeman, Fox, and Redelheim (1993) looked at increasing and maintaining withdrawn preschoolers' peer interactions with the effects of double prompting and booster session procedures. In this multiple baseline design across subjects, four socially withdrawn preschool children were prompted and praised by the teacher for initiations and responses associated with their peers. During the intervention phase, the teacher prompted the following behaviors: play organizers, shares, and assists. The results indicated that the intervention increased participants play organizer, share, and assist initiations as well as participants extended interactions with peers increased.

Types of toys available may facilitate or inhibit children's social behaviors (Martin, Brady, & Williams, 1991). The Division of Early Childhood (DEC) recommended practices states that adults should provide interesting toys, materials, and activities that encourage children to make choices independently and to want to continue playing (Wolery, 2005). All forms of play are closely related to materials and equipment (Frost, Shin, & Jacobs, 1998).

Environmental arrangements can effect how children play with each other. Physical arrangements communicate a symbolic message to children about what is expected to happen in a particular place (Frost, Shin, & Jacobs, 1998). It is important that the environment promotes children's safety, active engagement, learning, participation, and membership (Wolery, 2005).

In order to increase the likelihood of successful peer play interactions children should exhibit the following skills: language skills, social pragmatic skills, and literacy skills. Children with age appropriate language abilities are more involved with their peers during play (Sigman & Ruskin, 1999). Linguistic and pragmatic skills overlap with social skills in ways such as initiating to peers, responding to peers, and joining in ongoing play with peers (Craig-Unkefer & Kaiser, 2002). Early language is thought to establish a foundation for more complex skills which allow for more sophisticated behaviors in social interactions (Herbert-Myers et al, 2006). Children that incorporate literacy skills (e.g. pretending to read, write) into their play can use more complex language when playing with peers thus increasing their play abilities (Neuman & Roskos, 1992)

When children have fewer developmental skills, there less likely to engage in high quality peer interactions. Children who have poor communication skills tend to have difficult interactions with peers (Craig-Unkefer & Kaiser, 2002). In addition, children with language delays may have difficulty interpreting nonverbal social cues that are important to play (Herbert-Myers et al, 2006). Many children who have difficulty making and maintaining relationships are at an increased risk for internalizing and externalizing behavior problems (Herbert-Myers et al, 2006).

There are a multitude of interventions that have been conducted to increase social interactions among preschool age children. Interventions have included adult-mediated and peer-mediated strategies. In adult-mediated interventions, adults provide the support necessary for children with limited social communication skills to engage in the play of the peer group (Hadley & Schuele, 1995). Adult-mediated strategies to support language during play include: (a) providing joint attention to objects and giving the child labels to describe objects (Goldfield, 1987); (b) providing responses contingent on children's communication attempts and assigning meaning and interpretation of their language (Snow, 1984); and (c) modeling language in context so that children can learn the forms, semantic content, and social communicative use of language appropriate to the interaction (McReynolds, 1978). Peer-mediated interventions take advantage of children's ability to learn social and communication skills from peers in the context of play (Craig-Unkefer & Kaiser, 2002). Because play partners have equal status, peer interactions in play can provide opportunities to gain negotiation skills, role-taking ability, and popularity with peers (Gertner, Rice, & Hadley, 1994).

The purpose of this analysis was to determine the effect of a multi-component intervention of the play behaviors of the participants across phases at specific session (last three baseline and last three intervention sessions). There were four questions that guided this analysis: (1) What play behaviors were displayed by children during baseline and intervention sessions?, (2) Was there a difference in play behaviors from baseline and intervention?, (3) Did the quality of play increase or decrease across phases?, (4)What is the relationship between mean length of utterance (MLU) and complex play behaviors?

Method

These data were taken from as study conducted by Stanton-Chapman, Kaiser, Vijay, and Chapman (2008).The purpose of the original dataset was to see if a multi-component intervention strategy could increase peer directed social communication with eight Head Start children at risk for poor language and social skill development. For this study, I analyzed a subset of this data. The subset included the last three baseline sessions and the last three intervention sessions. As indicated in the purpose of this study, data analysis focused on the play behavior of the participants.

Participants

The participants were eight preschoolers between the ages of 3 years 9 months and 5 years and 0 months from two Head Start centers. The participants were selected for participation based on the following criteria: (a) Preschool Language Scale-3 (PLS-3); Zimmerman & Pond, 1992) standardized total language scores at least 1 SD below the mean (a score of 86 or below), (b) borderline or clinical levels of externalizing or internalizing behaviors indicated by the teacher on the Child Behavior Checklist (CTRF; Achenbach, 1997), or (c) demonstrated few social skills as indicated by the social skills subscale of the Social Skills Rating Scale (SSRS; Greshem & Elliot, 1990). Participants were considered at risk for language delays or behavior problems or both. Children were excluded from participation if they had significant sensory impairments or a previous diagnosis of mental retardation, behavior disorder, or pervasive developmental disorder. Six children met the criteria for language delay with one child (B1) also meeting the criteria for problem behavior. Participants B2 and C2 were included in the study because

their classroom teachers expressed concerns about their language skills and their ability to interact with their peers. Their standardized assessment scores did not indicate low language skills. Dyad pairings were constructed based on classroom enrollment as requested by center directors who asked that they keep classroom disruptions to a minimum and work with children during classroom freeplay times only. The ages, pre and post total PLS-3 standard scores, pre and post Peabody Picture Vocabulary Test (PPVT) (Dunn & Dunn, 1997) scores, pre and post Expressive Vocabulary Test (EVT) (Williams, 1997) scores, and pre and post social skills SSRS scores for the eight children are shown in Table 1.

Experimental Design

A multiple baseline design across two dyads replicated across two additional dyads was used (Kazdin, 1994). Dyads A and B were enrolled in one Head Start program while Dyads C and D were enrolled in a different Head Start program. Implementation of the intervention for Dyads C and D were not dependent on the results of intervention for Dyads A and B. However, both interventions were conducted concurrently across the two sites.

Experimental Conditions

Baseline conditions. Baseline sessions were 10 minutes in length. An adult interventionist, brought the two children into a playroom and invited them to play with the toys provided. The toys used in the baseline condition were identical to the toys used in the intervention condition and followed the same cycle of presentation (Session 1: Grocery Store; Session 2: Doctor Theme; Session 3: Construction Theme; Session 4: Veterinarian Theme; Session 5: Hair Salon/Barber Shop). Once the dyad completed

session five, the toy cycle started over again. The interventionist engaged in minimal conversation with the children while they played. She only interjected if a child was displaying behaviors that might be harmful to peers or destructive with materials.

Intervention conditions. Intervention sessions were conducted five days per week and lasted on average about 25 minutes. Three sequential components were employed during the intervention sessions (a) an advanced play organizer, which lasted about 10 minutes; (b) a play session which lasted about 10 minutes; and (c) the review session, which lasted about 5 minutes. The intervention focused on teaching four social pragmatic skills (English et al., 1997): 1) Talk to your friend, 2) Listen then respond to what your friend says, 3) Use your friend's name, and 4) Take your turn and give your friend a turn.

The interventionist began intervention sessions with an advanced play organizer that identified the designated play theme for the children (e.g. "Today we are going to play barber shop"). Collectively the interventionist and the children labeled the toys to be used during the play theme. Labeling the toys was used to teach specific vocabulary related to the play theme. Children were then introduced to the pretend roles (e.g. stylist and customer) for each theme (English et al., 1997). The interventionist used the pictures from the storybook to discuss the roles related to the particular theme (e.g. animal doctor, a dog owner). The social pragmatic skills were taught during the book reading. The interventionist pointed to the picture symbol that was depicted on the page and asked the children what the picture symbol meant (i.e. "What does this mean?"). When each social pragmatic skill was introduced, the associated picture symbol was also introduced and taught.

Next, the interventionist discussed the strategy with the children, using the storybook pictures (e.g. “Tony listens when Angie is talking about her dog. Then, he says, ‘I’ll help your dog feel better’. We listen to our friends and then talk to them”). The social pragmatic skills were taught sequentially over the course of the intervention. Talk to your friend was introduced in session one. Listen and then respond to what your friend says was introduced in session three. Use your friend’s name was introduced in session eight. Take your turn and give your friend a turn was introduced in session twelve. This order was established based on a previous related study (Stanton-Chapman et al, 2006). The storybooks were designed so that additional pages could be added or deleted. As each pragmatic skill was introduced during the intervention, the teacher added any needed pages to the story. When finished reading the book to the children, they planned their play. The children selected the roles they wanted to play during the play session and the interventionist suggested ways the children might talk to one another when playing (e.g. “Cody you can take your sick dog to see Amy, the animal doctor”). After the children role-played, the interventionist told them it was time to play.

Play Sessions. Immediately following the advanced play organizer intervention component, play sessions were conducted five days per week and lasted 10 minutes. During the play session, the children played with the thematic toys provided that day. The interventionist’s role was to prompt children to engage in the thematic play activity, to interact using the social pragmatic skills, and to use the specific language forms. Prompting was done when the children were in proximity to one another but were not currently talking. The four social pragmatic skills were introduced sequentially across 20 intervention sessions for each dyad. As each new social pragmatic skill was introduced, it

was prompted in the following play sessions, along with the previously introduced social pragmatic skills (e.g., when name use was taught in the advanced play organizer component, name use, listening and responding, and talking to peers were prompted in the play session). Three types of prompts were used: models, mands, and indirect instructions. When using a model, the teacher provided children with a specific utterance to use with peers (e.g., "Say, 'I want to use the band aid."). A mand was an explicit instruction to verbalize to peers, but the target children were not given specific utterances to say (e.g., "Ask Tony for help."). With mands, the target children were expected to generate the specific statement to peers. For example, a target child might be expected to say, "Amy, I need help.". Indirect instructions were teacher prompts that suggested to target children that they should interact with peers (e.g., "I think Collin has some nails you can use.") but did not specifically indicate that a verbal response was required.

A prompt hierarchy was established for prompting the social pragmatic skills. If a child was engaged with the materials, but not currently interacting with a peer, the interventionist prompted the child to initiate to a peer (*talk to your friend*). If a child was engaged with a toy and a peer initiated talk but the child did not respond, the interventionist encouraged the child to respond (*listen then respond to what your friend says*). If a child attempted to initiate a conversation with a peer, but the peer did not respond, the interventionist would prompt the child to use the peer's name to obtain his or her attention (*use your friend's name*). Finally, if a child initiated a conversation, the peer responded, but the child did not respond in an attempt to maintain the conversation, the interventionist would prompt the child to respond to the peer (*take your turn and give your friend a turn*).

At the conclusion of the play session, the children reviewed their performance in the play session with the interventionist. First, the interventionist reviewed the thematic roles with the children. The children were asked, “Who did you play with today?” and “What did you do?”. Second, the interventionist reviewed the use of specific language forms with the children (e.g., “Did you use any of our new words when you played today?”). Finally, the interventionist reviewed the children’s use of the targeted social pragmatic strategies by asking the children if they did each of the four strategies, (e.g., “Did you listen to your friend and then talk to her?”). Children were verbally praised if they reported correctly that they had performed a target behavior. Failure to report or incorrect reports were followed by teacher verbal corrections (e.g., “Yes, you did talk to Mark while you played.” or “No, Amy, you didn’t use Marks name today.”).

Setting

Baseline and intervention conditions were implemented during the morning at a mutually convenient time for teachers in rooms at the Head Start centers that were used for small group activities or meetings. The same teacher conducted baseline and intervention sessions. A digital camcorder, which was on a tripod positioned in a corner of the room, was used to videotape all baseline and intervention sessions.

Materials

Play materials were assembled and developed based on four dramatic play themes shown in Table 2. Storybooks about each theme were designed as well and the books included pictures of Head Start children and the materials and props used during play sessions. The books were computer generated using a digital camera and template. The African-American boy and girl pictured in the storybook were chosen to increase the

likelihood the children in the intervention would identify with them. The storybooks: (a) told a story that illustrated thematic play (e.g., taking the dog to the animal doctor); (b) included models for verbalizations during role playing (e.g., "The animal doctor says 'Is your puppy sick?'"); (c) included specific theme vocabulary (e.g., *stethoscope*, *shot*); and (d) emphasized four social pragmatic strategies that were illustrated in the stories with picture symbols (cf. English, Goldstein, Shafer, Kaczmarek, 1997). For example, a picture symbol of a stick figure holding his ear represented the strategy "Listen, then respond to what your friend says." Picture symbols were designed to assist children in remembering the social pragmatic strategies.

The thematic play materials were similar to types of toys and activities usually available in the two Head Start programs. Each theme consisted of 17 different toys. To ensure that the materials were culturally appropriate and ethnically valid, researchers and classroom teachers of the same ethnic background as the participants assisted in selecting toys that were a part of the children's ethnic identity (Barnett, Bell, & Carey, 1995).

Data Collection

Data collection procedures for the last three baseline and last three intervention sessions included: (a) coding videotaped sessions using the Peer Play Code (Craig-Unkefer & Kaiser, 1998) as seen in Table 3. Coding was done in 15 second intervals, an observer watched an interaction for 15 seconds and then recorded their observations for 15 seconds for each child in the dyad (b) videotaped transcriptions using the Systematic Analysis of Language Transcripts (SALT; Miller & Chapman, 1985). Data on linguistic measures (mean length of utterance (MLU)) were completed from the SALT analysis.

Results

The purpose of this study was to determine if an intervention that focused on language and social pragmatic development affected the play behaviors of the participants. There were four research questions that guided this study: 1) What play behaviors were displayed by children during baseline and intervention phases?, 2) Was there a difference in play behaviors from baseline and intervention?, 3) Did the quality of play increase or decrease across phases?, 4) What is the relationship between MLU and complex play behaviors?

Play Behaviors

The mean percentage of the solitary, onlooker, parallel, associative, and cooperative play was determined by adding the total number of intervals for each behavior and dividing by the total number of intervals. Each of the play behaviors was coded and discussed from least to most complex.

All participants engaged in solitary play throughout both baseline and intervention sessions. Figure 1 displays the frequency of solitary play behaviors for Dyad A. Dyad A was the only dyad where both participants increased in solitary behavior. During baseline, Child A1 displayed solitary play behaviors 19% of the total intervals, Child A2 displayed solitary play behaviors 10% of the total intervals coded. During intervention Child A1 increased solitary play behaviors to 34% of the total intervals, Child A2 as well increased solitary play behaviors to 45% of total intervals coded.

Dyad B shows the most notable decrease in solitary play behavior from baseline to intervention (see Figure 2). Child B1 displayed solitary play behaviors 76% of the time during baseline. Child B2 displayed solitary play behaviors 67% of the time. During

intervention Child B1 displayed solitary play behaviors 30% of the time and Child B2 displayed solitary play behaviors 35% of the time.

Figure 3 displays solitary play for Dyad C. Child C1 displayed solitary play 37% of the total intervals of the baseline sessions. Child C2 displayed solitary play 48% of the total baseline sessions. During the intervention sessions Child C1 increased to 48% of the total sessions, whereas Child C2 decreased to 46% of the total sessions.

For Dyad D (see Figure 4), Child D1 displayed solitary play 63% of the total baseline sessions. Child D2 displayed solitary play 55% of the total baseline sessions. Both children in Dyad D decreased their solitary play during the coded intervention sessions, Child D1 displayed solitary play 28% of the time and Child D2 displayed solitary play 41% of the time.

Figure 5 illustrates the percentage of intervals of onlooker play behaviors for Dyad A. Dyad A stayed rather consistent from baseline to intervention sessions with onlooker play behaviors. Child A1 displayed onlooker play behaviors during baseline 10% of the total intervals, whereas Child A2 displayed onlooker play behaviors 2% of the total intervals. As for the intervention sessions, Child A1 displayed onlooker play behaviors for 8% of the total intervals and Child A2 displayed onlooker play behaviors 2% of the total intervals.

The onlooker play behaviors for Dyad B are presented in Figure 6. Child B1 displayed onlooker play behaviors 4% of the total intervals during baseline sessions. Child B2 displayed onlooker play behaviors 9% of the total intervals. Throughout the intervention sessions, Child B1 displayed onlooker play behaviors 2% of the total intervals; Child B2 displayed onlooker play behavior 5% of the total intervals.

Dyad C (see Figure 7) was an exception for this behavior Child C2 display onlooker play behaviors intervention only. Child C1 displayed onlooker play behaviors 10% of the intervals coded. During intervention, Child C1 displayed onlooker play behaviors during 7% of the intervals; Child C2 displayed onlooker play behaviors 9% of the total intervals.

Onlooker play behaviors for Dyad D are in Figure 8. Child D1 displayed onlooker play behaviors during baseline 5% of the intervals, whereas Child D2 displayed onlooker play behaviors during baseline 15% of the intervals. During intervention sessions, Child D1 displayed onlooker play behaviors 9% of the total intervals; Child D2 displayed onlooker play behaviors 4% of the total intervals.

All children engaged in parallel play behaviors in both baseline and intervention sessions. Due to the fact that parallel play is coded when both participants are displaying the play behavior, the percentage is the same for each participant per dyad. Dyad A (see Figure 9) decreased their parallel play from baseline to intervention sessions. Dyad A exhibited parallel play behaviors 46% of the total baseline intervals and 28% of the total intervals during intervention sessions.

Dyad B (see Figure 10) displayed parallel play behaviors 18% of the total intervals during baseline. During intervention phase, parallel play was displayed 35% of the total intervals.

Parallel play for dyad C (see Figure 11) was displayed 30% of the total intervals during baseline. During intervention phase, parallel play was displayed 26% of the total intervals.

Dyad D (see Figure 12) displayed parallel play during 22 % of the total intervals during baseline sessions. Throughout intervention sessions, Dyad D displayed parallel play 37 % of the total intervals.

The frequency of associative and cooperative play behaviors were combined across participants per session. Associative and cooperative were the least observed play behaviors but they were both present in baseline and intervention sessions. Dyad A (see Figure 13) displayed the highest percentage of associative and cooperative play behaviors for both baseline and intervention sessions. However, their increase was very low compared to the other dyads. During baseline, Dyad A displayed associative and cooperative play behaviors 19% of the total intervals and during intervention they displayed the combined play behaviors 21% of the total intervals. Dyad B (see Figure 14) also increased from baseline to intervention from 2% of the total intervals to 12% of the total intervals during intervention sessions. During baseline sessions for Dyad C (see Figure 15) the combined play behaviors observed was 12% of the total intervals. However, during intervention session Dyad C exhibited associative and cooperative play behaviors 19% of the total intervals. Dyad D (see Figure 16) displayed associative and cooperative play behaviors 4% of the total intervals during baseline sessions. Dyad D increased associative and cooperative play behaviors to 15% of the total intervals in the last three intervention sessions.

Phase Differences

Solitary play was exhibited more than any of the other play behaviors. For some of the participants (Child A1, Child A2 and Child C), solitary play increased from baseline to intervention. Onlooker play behaviors were coded less frequently across

phases. Child C2 was the only participant who did not display onlooker behaviors during baseline sessions. Most participants decreased the onlooker play behavior from baseline to intervention. However, Child C2 and Child D1 increased their onlooker play behavior from baseline to intervention phase. As for parallel play, there was a split between dyads. Dyad A and Dyad C both decreased their parallel play behaviors from baseline to intervention. Dyad B and Dyad D increased their parallel play behaviors from baseline to intervention phase. Associative and cooperative play behaviors were the only behaviors that increased for all participants from baseline to intervention phase.

Play Quality

Associative and cooperative play behaviors are the most complex play behaviors of the five total play behaviors that were coded. All children decreased in solitary play from baseline to intervention with the exception of child, A1, A2, and C1 who all increased in solitary play behaviors. Onlooker play behaviors were inconsistently displayed across children. Child C1 decreased from baseline to intervention whereas Child C2 increased. Child D1 increased in onlooker play behaviors and Child D2 decreased. Child B1 and Child B2 both decreased in their onlooker play behaviors. Child C1 decreased and Child A2 displayed the same amount of onlooker play behaviors throughout both baseline and intervention phases. Dyad A and Dyad C both decreased in their parallel play behaviors, whereas Dyad B and Dyad D both increased in parallel play. Associative and cooperative play increased for all dyads from baseline to intervention sessions. Overall, there were only three participants that decreased in solitary and onlooker play behaviors and increased in the more complex play behaviors (parallel, associative, and cooperative), Child B1, Child B2, and Child D2.

Language and Complex Play

Children's MLU were measured in both baseline and intervention sessions and are presented in Table 4. Mean MLUs were calculated for the last three baseline and interventions conditions separately. All participants had higher MLUs during intervention. Child A1 had an MLU of 2.53 during baseline and 2.95 during intervention. Child A2 had an MLU of 3.12 during baseline and 3.45 during intervention.

Child B1 increased their MLU from 3.50 during baseline to 4.10 during intervention. Child B2 has the highest MLU increase for all participants from 2.35 during baseline to 4.37 during intervention sessions.

Child C1 increased their MLU from 3.27 during baseline to 4.09 during intervention. Child C2 had a baseline MLU of 3.48 and slightly increased to 3.89 during intervention.

Child D1 had the next highest increase among all participants with an MLU of 2.77 during baseline and increased their MLU to 3.24 during intervention sessions. Child D2 had an MLU of 3.28 during baseline and 3.45 during intervention. Although Child D2 had the least increase in MLU among all participants, their overall MLU was fairly consistent throughout both baseline and intervention phases.

There is a relationship between language use and complex play. Across all dyads, as MLU increased so did complex play. Dyad A increased in associative and cooperative play from baseline to intervention. However, Dyad A only exhibited a 2% increase from baseline to intervention. Dyad B increased their associative and cooperative play behaviors from baseline to intervention with a 10% increase. Dyad C had a 7% increase in associative and cooperative play behaviors from baseline to intervention phase. Dyad

D had the largest gain in associative and cooperative play behaviors from 4% during baseline to 15% during intervention sessions.

Discussion

The purpose of this study was to analyze an intervention focused on language and social pragmatic development and how it affected play behaviors for eight preschool aged children at risk for language delays or behavior problems or both. The intervention was not consistent in promoting complex play behaviors across dyads. However the intervention proved to minimally increase the complex play behaviors (associative and cooperative) but, the lower level play behaviors (solitary, onlooker, and parallel) still dominated the majority of the play between participants.

The intervention had the most positive effect in terms of play behaviors on Dyad B. Child B1 and B2 engaged in the most solitary play behavior during baseline. During the intervention phase there was a decrease in their solitary play and an increase in their associative and cooperative play. Due to the nature of complex play and the critical component of language, as play became more complex, language, specifically mean length of utterance increased. Play quality for Dyad B was greatly increased from this intervention.

Dyad D engaged in similar decreases and increases in play behaviors. Both Child D1 and D2 decreased their solitary play from baseline to intervention. They too had a notable increase of associative and cooperative play from baseline to intervention. Both Child D1 and Child D2 had increases in their MLUs from baseline to intervention but their increase was less than Dyad B. One explanation for less of an increase in MLU was

that the children were talking during baseline but their talk was not directed at their peer or the activity. The minimal MLU increase during the intervention phase may have occurred as a result of more focused discussion towards their peer and on the play activity.

The intervention had the least effect on the play behaviors of Dyad C. Child C1 had a slight increase in solitary play from baseline to intervention. Child C2 increased in onlooker play behaviors from baseline to intervention. Both children increased associative and cooperative play. There was a distinction of MLU rates between these children. Child C1 had the second highest increase in MLU from baseline to intervention across all participants. Child C2 had a minor increase of MLU from baseline to intervention. Dyad C was exemplifying complex play behaviors during baseline with a minor increase during intervention which implies their talk during intervention was more directly related to the activity in which they were engaged in.

For Dyad A the intervention seemed to almost prohibit the participants from engaging in complex play behaviors. During baseline both Child A1 and Child A2 showed the lowest solitary play of all the participants and so their associative and cooperative play was the highest across all dyads. However, during intervention their solitary play increased, Child A1 had an increase by 15% and Child A2 increased by 35% from baseline to intervention. Their associative and cooperative play only increased by 2% from baseline to intervention. Both Child A1 and Child A2 had minimal growth in the MLU from baseline to intervention. The intervention may have stunted their play complexity.

The multi component intervention had variable effects across dyads. One explanation for the variability could have been a component of the intervention, the use of prompts by the interventionist. Prompts given by the interventionist increased peer talk and may have influenced the increase of associative and cooperative play behaviors during intervention sessions. However, prompting could have caused some participants to decrease their peer talk and play because there was less opportunity to talk. The Vygotskian theory points to the importance of teacher talk that is geared to the needs of the child (Wilcox-Herzog & Kontos, 1998). The quality of talk presented by the interventionist could have both increased and decreased some of the participants' language and play behaviors. For some of the participants, the interventionist's quality of prompts proved to help increase their language and play behaviors but for the majority the intervention was not strong enough to increase both language and play behaviors consistently. Another consideration would be that the interventionist may have been inconsistent in her prompting; hindering the play and language behaviors of the children. One consideration is the use of time delay to increase children's spontaneity and decrease their dependence on adult prompts (Wolery, 2005). In addition the prompts should be faded or removed over time (Wolery, 2005). For this intervention, there was not a specific use of time delay in prompts given and there was no fading of prompts as well which played a role in some of the dyads lack of improvement in language and play behaviors.

Limitations

Limitations of the study are focused specifically on the analysis of the data subset. Only the last three baseline and last three intervention sessions were analyzed. If all of

the sessions had been analyzed there may have been a more systematic tracking of changes in both MLU and play behaviors from baseline to intervention sessions. In addition, there was an absence of a maintenance phase. Another limitation could also be that the peer play code was not sensitive enough to record a drastic change from baseline to intervention. Due to the multi components of this intervention it is hard to tease out which of the components had the most effect on the participant's language and play behavior increases.

Considerations for future research

Further research should investigate the individual needs of the participants and tailor the intervention prompts to those needs. The prompts should be dyad specific and the interventionist should observe how the children interact with each other as well as keeping track of the support they might need over time. In addition, the intervention should be conducted in a naturalistic environment verses a clinical type setting in which this intervention took place. A naturalistic environment provides the children with a familiar place to engage in similar activities as well as increase the probability they will be able to further their learned play behaviors. Finally, by adding maintenance phase will increase the likelihood that the skills learned will be maintained over time.

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Table 1.

Participant Characteristics

Children		Age (in months)	Gender	PLS-3* *(Pre)*	PLS-3* *(Post)*	PPVT *(Pre)*	PPVT *(Post)*	EVT *(Pre)*	EVT *(Post)*	SSRS** *(Pre)*	SSRS** *(Post)*
Dyad A	Child A1	48	Female	57	55	68	68	72	83	66	87
	Child A2	50	Male	80	73	87	98	98	101	101	99
Dyad B	Child B1	53	Male	77	69	72	76	85	90	74	80
	Child B2	60	Female	107	118	89	89	92	95	98	98
Dyad C	Child C1	51	Male	61	53	68	65	70	75	95	92
	Child C2	47	Female	91	75	65	84	85	93	90	84
Dyad D	Child D1	46	Male	76	57	75	79	90	65	90	85
	Child D2	45	Female	82	86	93	89	97	88	89	110

Note. PLS-3=Preschool Language Scale-3 (Zimmerman & Pond, 1992); PPVT= Peabody Picture Vocabulary Test(Dunn & Dunn, 1997);EVT=Expressive Vocabulary Test (Williams, 1997); SSRS= Social Skills Rating Scale (Greshem & Elliot, 1990).
*Note.** PLS-3 scores are total standard scores for the expressive and comprehensive subscales combined.
*Note.*** SSRS scores are total scores for the social skills subset.

Table 2.

Thematic Materials and Toys for Peer Intervention Sessions

Theme	Toys
Doctor	Stethoscope, blood pressure cuff, “needle” for shot, doctor costume, boy & girl baby dolls (European American, African American, & Hispanic), bandages, gauze, medical hammer, ace wrap, splint, empty medicine bottles, medical tape, alcohol wipes, eye/ear scope, arm sling, medicine cups, cotton balls
Animal doctor	Stethoscope, blood pressure cuff, “needle” for shot, animal doctor costume, stuffed animal dogs, stuffed animal cats, stuffed animal birds, cage, brush, food can, food/water dish, leash, collar, bandages, ace, wrap, towel, thermometer
Hairdresser/barber	Hair dryer, crème hair dress (African American hair care product), detangling moisturizer (African America hair care product), curling iron, shampoo, mirror, razor, shaving cream, clippers, comb, brush, boy &girl baby dolls (European America, African American, & Hispanic), barrettes, pretend make-up, scissors, aprons
Construction	Cardboard brick blocks, construction hats, construction costumes, tool boxes, tape measure, hammer, plastic nails, saw nuts, bolts, wrench, screwdriver, screws, electric saw, drill, level, tool belts

Table 3.

Peer Play Code Definitions

Category	Definition
Aggression	Aggression refers to non playful physical contact with another child. It is almost antagonistic in nature. Acts of aggression include hitting, kicking, and grabbing.
Solitary	The child is within the physical vicinity of peer, the child does not interact with the peer for at least 10 seconds.- Solitary play is coded when the child is isolated from the play area or wanders without noticing the other peer. Code solitary when the child is obtaining visual or auditory information from an object (physical manipulation of component of a toy- rolling a wheel on a car)
Onlooker	The child is watching the peer for at least 10 seconds but does not engage in play or interactive activity. The child may talk to the peer (offering suggestions or asking questions) but does not overtly enter into the play activity of the peer. In this play category, the child is definitely observing the peer.
Parallel play	The child plays independently but with toys that will bring him/her closer to the peer. The child plays beside but not with peer. The child plays with the toys as he/she see fit, and does not seem to influence or modify the activity of the peer. There is no attempt by the child to control the activity of the peer.
Associative play	The child plays with the peer. There is an exchange of materials. A conversational exchange occurs about common activity which has the potential to bring the other peer into the activity, but each child engages as he/she wishes. There is no division of labor, and no organization of the activity towards the development or creation of a mutually contrived project or play theme.
Cooperative play	Both children play in an organized and purposeful activity. The child directs the activities of other peer in the play interaction for some purpose necessitating a division of labor and an organization of roles. The play is goal driven so that the efforts of one peer are supplemented by those of the other peer.

Table 4.
Mean Length of Utterance in Baseline and Intervention Sessions

		Baseline		Intervention	
		Mean	Range	Mean	Range
Dyad A	Child A1	2.53	2.29-2.85	3.12	2.97-2.85
	Child A2	2.95	2.97-3.24	3.45	2.77-3.82
Dyad B	Child B1	3.5	3.00-3.86	4.1	3.83-4.57
	Child B2	2.53	0-4.33	4.37	4.35-4.38
Dyad C	Child C1	3.27	3.23-3.32	4.09	3.40-4.46
	Child C2	3.48	3.09-4.24	3.89	3.70-4.20
Dyad D	Child D1	2.77	2.00-3.23	3.24	1.75-4.06
	Child D2	3.28	2.50-4.00	3.45	2.17-4.36

Figure 1. *Solitary Play Behaviors for Dyad A*

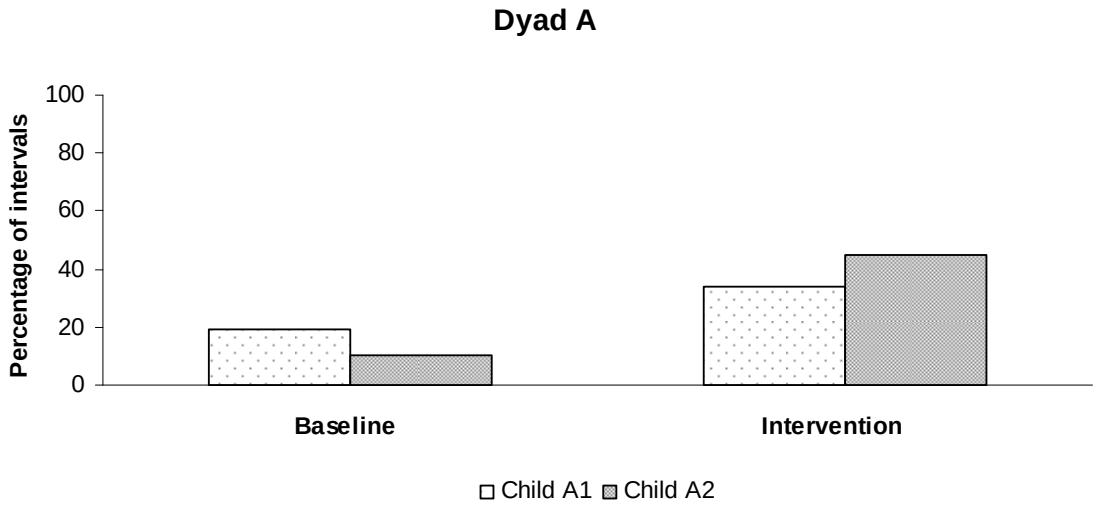

Figure 2. *Solitary Play Behaviors for Dyad B*

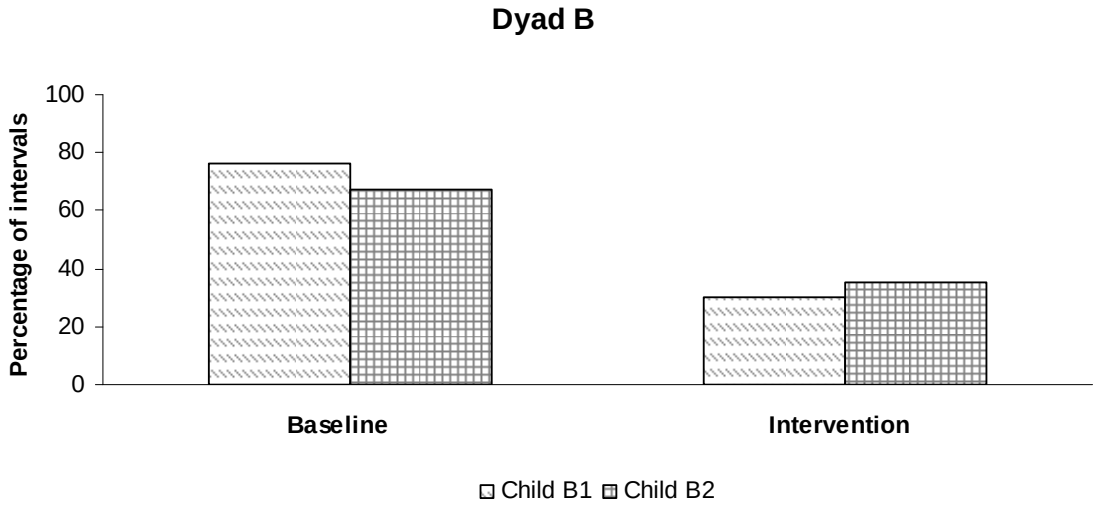

Figure 3. *Solitary Play Behaviors for Dyad C*

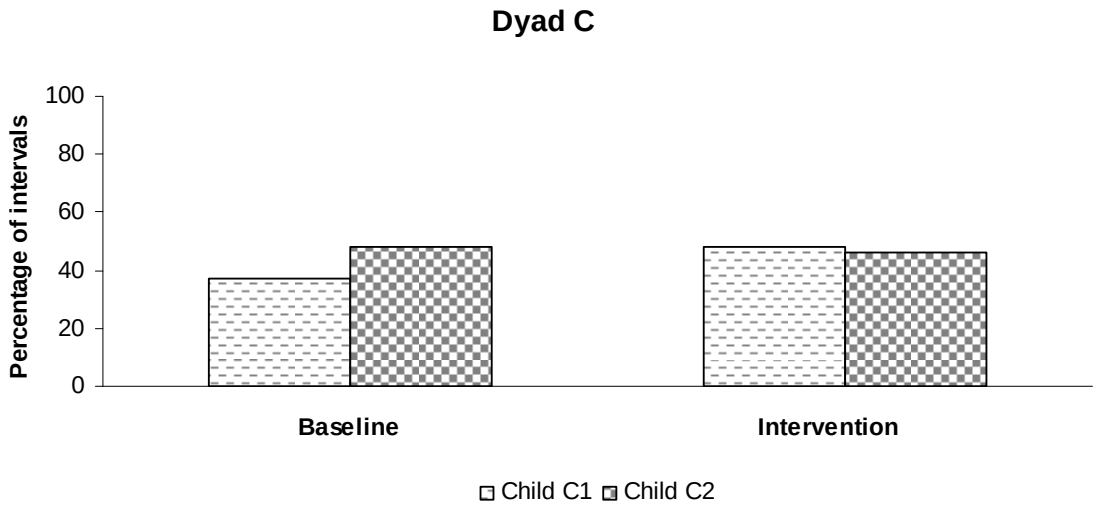

Figure 4. *Solitary Play Behaviors for Dyad D*

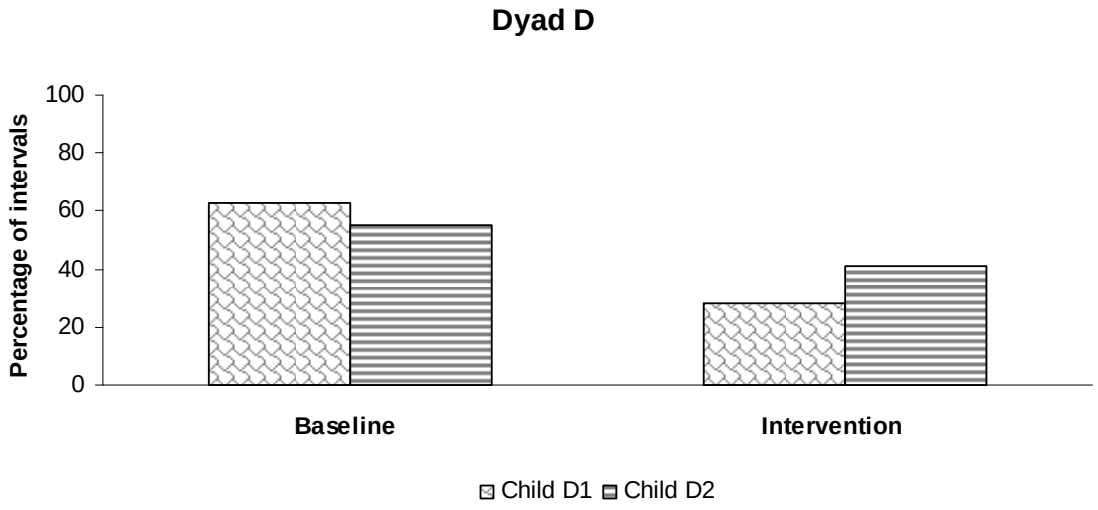

Figure 5. *Onlooker Play Behavior for Dyad A*

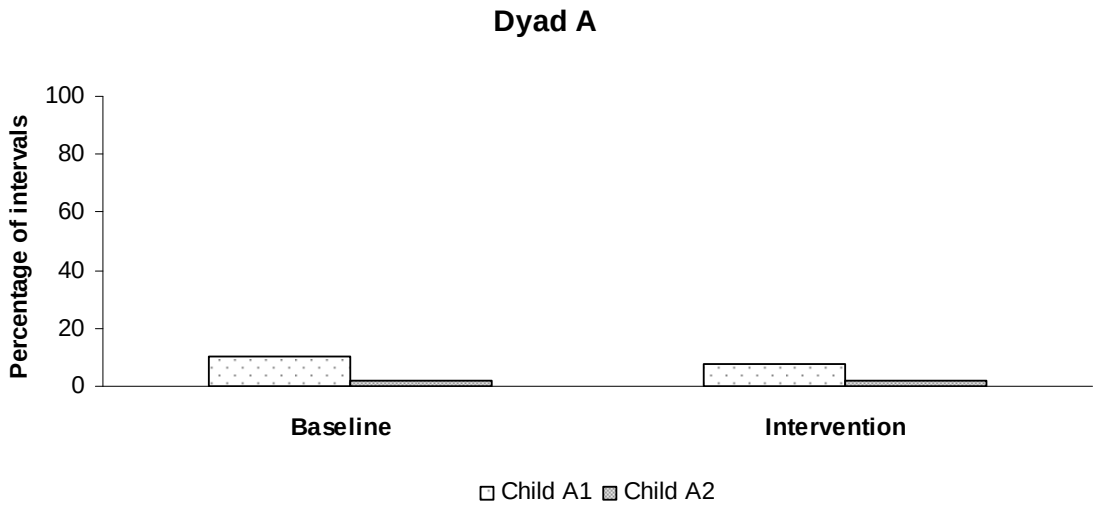

Figure 6. *Onlooker Play Behavior for Dyad B*

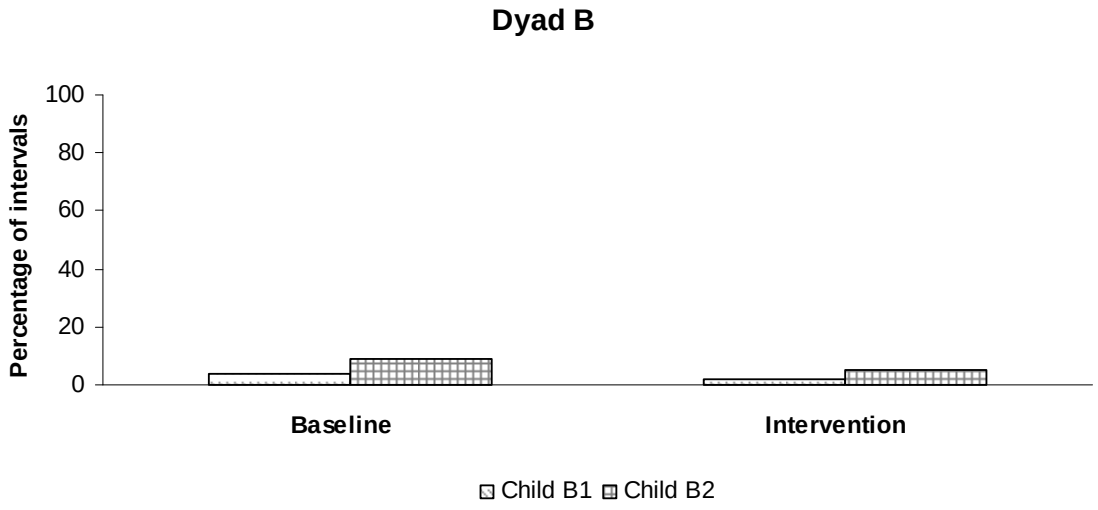

Figure 7. *Onlooker Play Behavior for Dyad C*

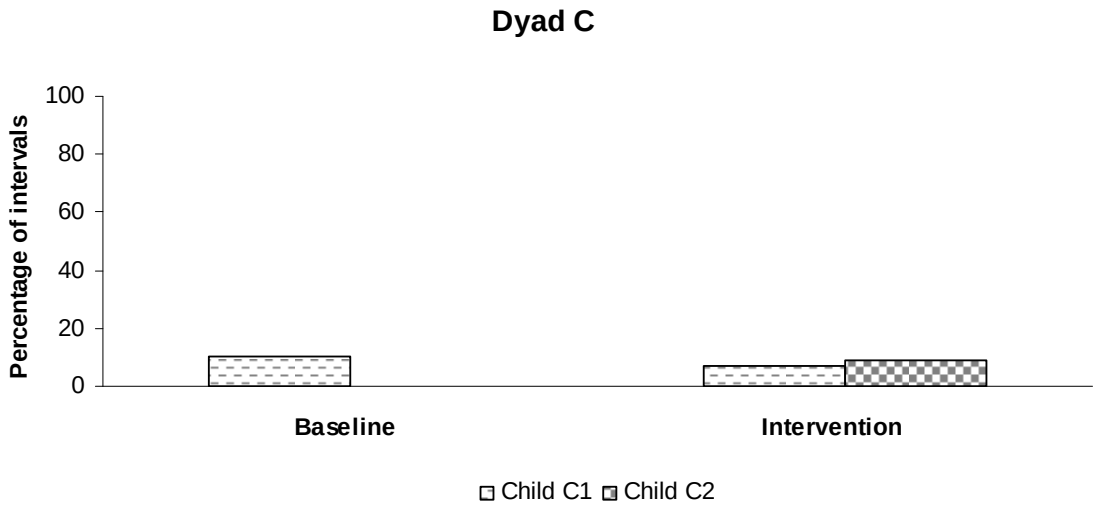

Figure 8. *Onlooker Play Behavior for Dyad D*

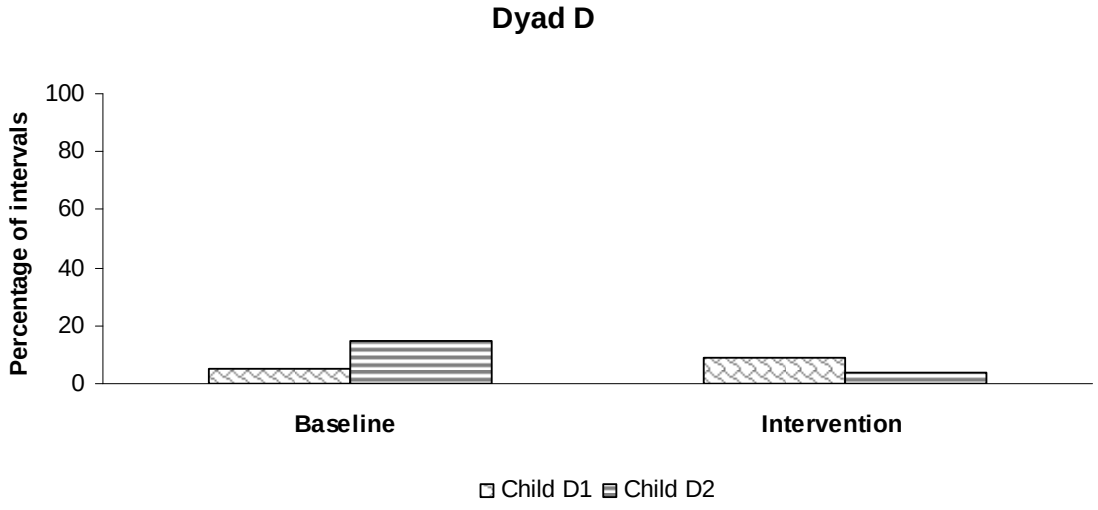

Figure 9. *Parallel Play Behavior for Dyad A*

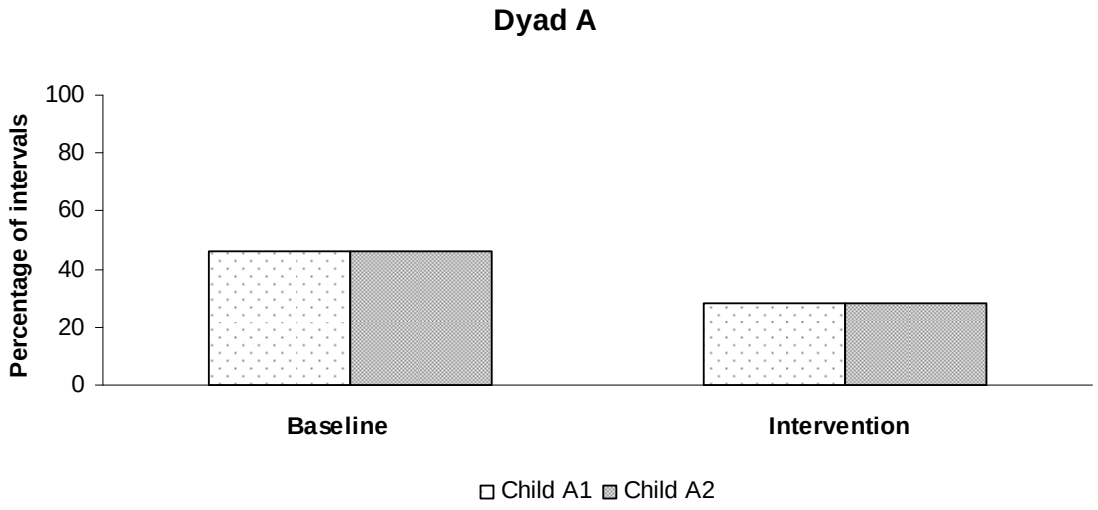

Figure 10. *Parallel Play Behavior for Dyad B*

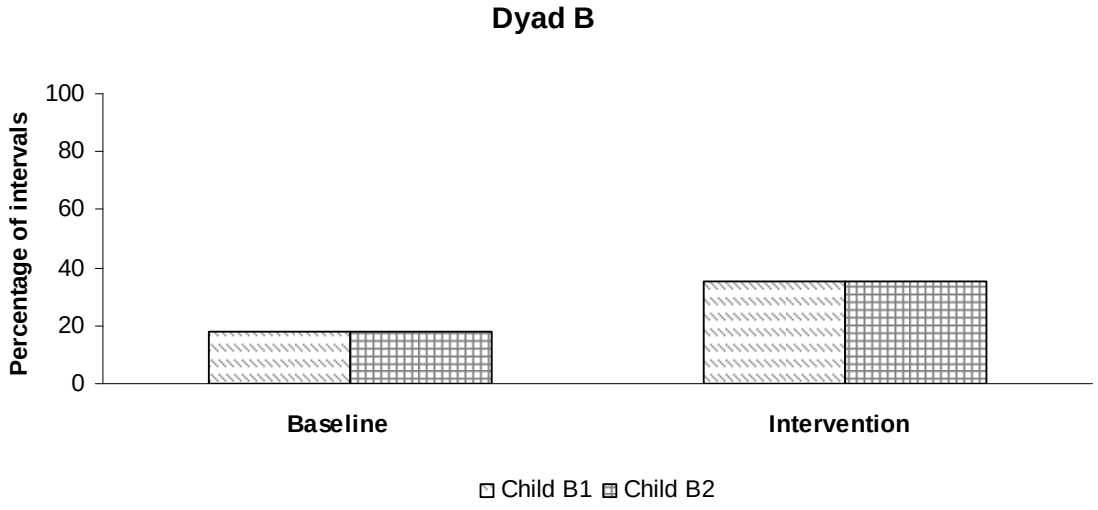

Figure 11. *Parallel Play Behavior for Dyad C*

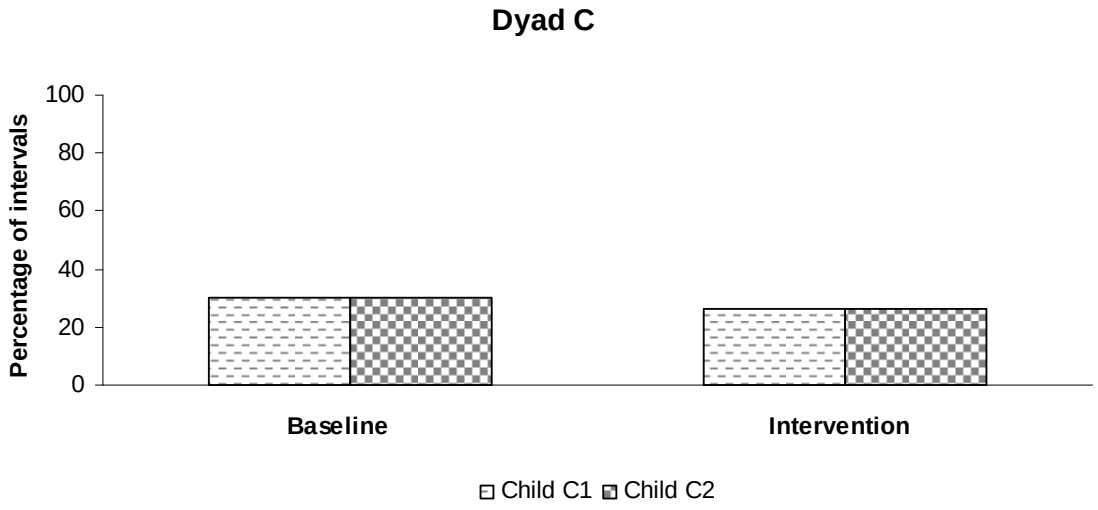

Figure 12. *Parallel Play Behavior for Dyad D*

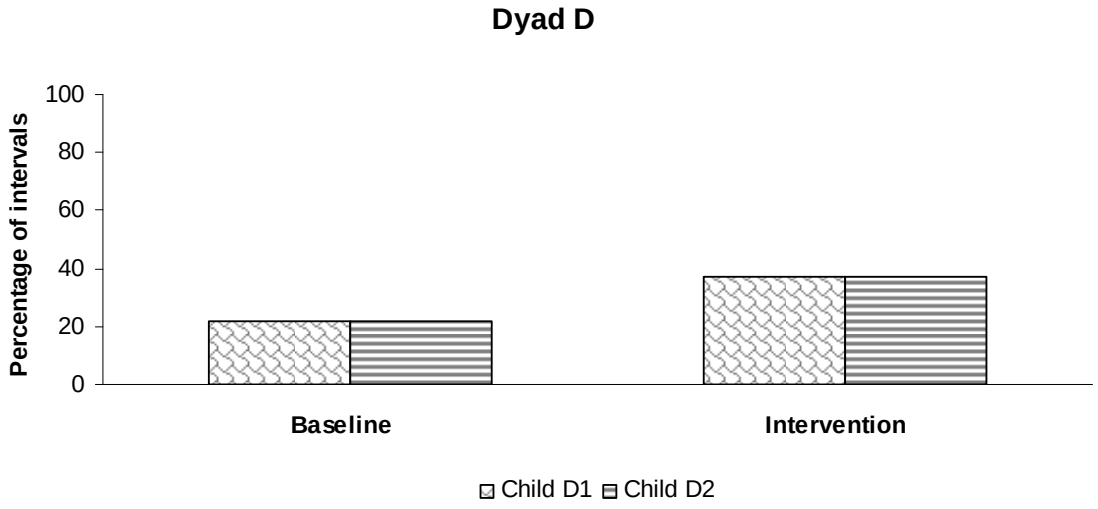

Figure 13. *Associative and Cooperative Play Behavior for Dyad A*

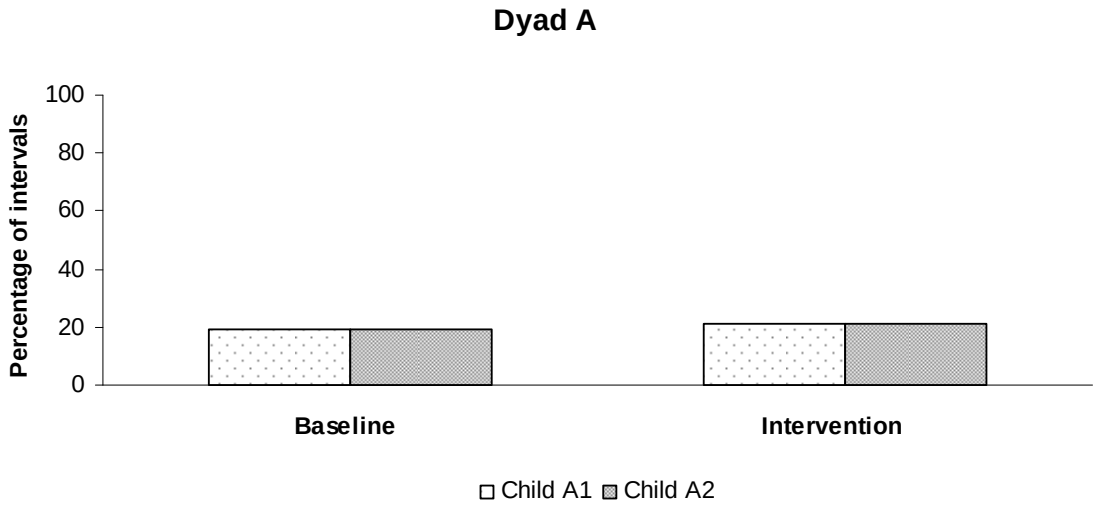

Figure 14. *Associative and Cooperative Play Behavior for Dyad B*

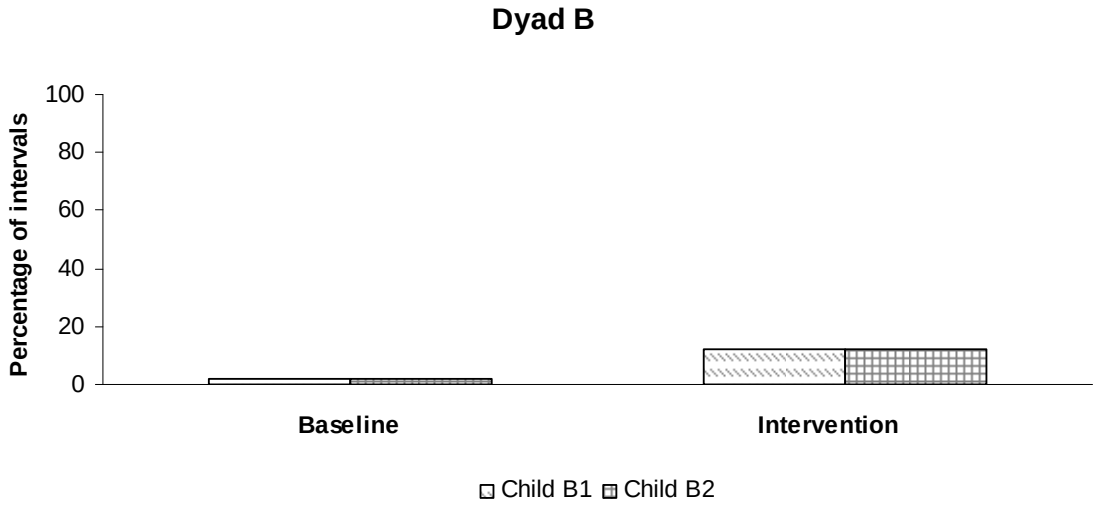

Figure 15. *Associative and Cooperative Play Behavior for Dyad C*

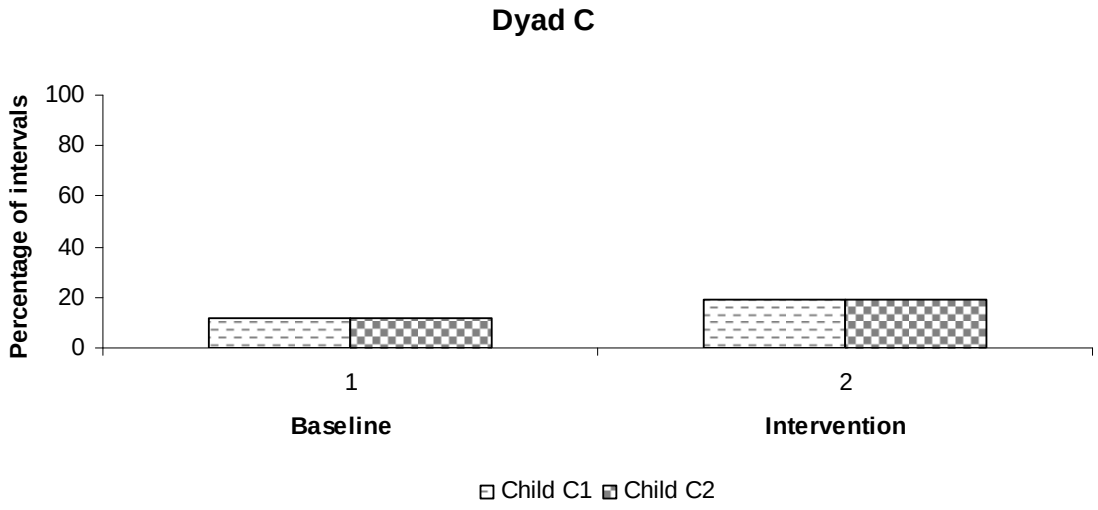

Figure 16. *Associative and Cooperative Play Behavior for Dyad D*