MANIPULATING TOY SETS TO INCREASE SOCIAL COMMUNICATION IN PRESCHOOL CHILDREN WITH SPECIAL NEEDS AND THEIR TYPICALLY DEVELOPING PEERS

by

SHANNON RENEE ELMORE

(Under the direction of CYNTHIA O. VAIL)

ABSTRACT

The purpose of this study was to evaluate the effects of manipulating toy sets on the social verbal interaction that occurs between preschool aged children with disabilities and their typically developing peers. A single subject alternating treatments design was used to evaluate the effects of manipulating social toy sets and isolate toy sets on social interactions. Participants included 1 female student and 3 male students with Significant Developmental Delay. The study took place within an inclusive preschool setting in North East Georgia. Students included in the study were presented with opportunities to play with the different toy sets on alternating days with their typically developing peers. The results indicate that social toy sets in isolation elicit a higher amount of social interaction compared to isolate toy sets in isolation. Given these preliminary results a discussion on whether or not manipulating toy sets is an effective, efficient, and socially valid means of increasing social interactions in inclusive preschool settings follows.

INDEX WORDS: preschool, inclusion, social toy sets, isolate toy sets, social interactions, social communication, verbal interactions, disabilities, social verbal interactions

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B.S., University of Georgia, 2007

A Thesis Submitted to the Graduate Faculty

of The University of Georgia in Partial Fulfillment

of the

Requirements for the Degree

MASTER OF ARTS

ATHENS, GEORGIA

2009

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August 2009

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Chapter 1

Introduction

Social verbal interaction is a critical component to the development of the social, communication, cognitive, and motor domains for young children as it helps them to learn about their world (Anita, 1983). Students with special needs face challenges in the area of socialization within the classroom specifically with communication. With the growing trend of children with special needs being placed in inclusive preschool settings, it is important to understand how to influence social interactions between children with disabilities and their peers without disabilities. Children with disabilities may have a more difficult time initiating play with their peers and responding appropriately to play initiations by peers (Guralnick & Groom, 1988). The way in which children with disabilities utilize toys may not provide sufficient opportunity for social play (Landry & Chapieski, 1989). Children with disabilities may also acquire skills at a slower rate and in a different means than their typically developing peers (Malone & Langone, 1999). This can greatly inhibit their ability to progress in the developmental domains and utilize toys effectively. Many of the strategies that have been utilized to increase social interactions such as peer training, self-monitoring, teacher prompting, and modeling have been shown to be effective but may be considered intrusive, complex, and time consuming. These strategies may also prove inconsistent with developmentally appropriate early childhood practice such as child-centered approaches (Ivory & McCollum, 1999).

The management of setting events is another approach to facilitating social interaction. Setting events are environmental conditions that influence the interaction between stimuli and responses (Brown, Bryson-Brockmann, & Fox, 1986; Morris, 1982), rather than directly elicit behaviors. Specific types of setting events include the availability of toys (Chandler, Fowler, &

Lubeck, 1992; Strain & Odom, 1986), types of toys and materials (Beckman & Kohl, 1984; Cowden & Torrey, 1990; Hendrickson, Strain, Tremblay, & Shores, 1981; Innocenti *et al*., 1986; Ivory & McCollum, 1999; Johnson & Ershler, 1985; Martin, Brady, & Williams, 1991; McCabe, Jenkins, Mills, Dale, & Cole, 1999; Rettig, Kallam, & McCarthy-Salm, 1993; Rubin, 1977; Stoneman, Cantrell, & Hoover-Dempsey, 1983), varying child groupings, availability of adults within the setting and the amount of available physical space (Chandler, Lubeck, Fowler, 1992). Of particular interest here is the effect of manipulation of the types of toys and materials used on social interaction. Unlike other approaches, manipulation of setting events, such as toy sets, is non-intrusive (Ivory & McCollum, 1999), can be easily managed (Innocenti *et al*., 1986), and may be more consistent with developmentally appropriate early childhood practice (Hughes &Carter, 2002).

The research regarding the manipulation of toys sets has generally involved a comparison between social and isolate toys. Most of those results have shown that social toys elicit more social interactions than isolate toys. The following is a review of nine studies that reported results regarding social and isolate toys that are important for practice and future research. Several important components of the research articles will be discussed including characteristics of participants, design, type of intervention, dependent variable, and findings.

Of the studies reviewed here, five compared social versus isolate toys and one compared social versus isolate toys and group composition. One study compared ordinary versus adaptive toys and one compared toy sets of mixed, vehicle and dolls. The final study compared functional, constructive, and dramatic toys.

Characteristics of participants

The nine studies included 137 children with disabilities and 34 children without disabilities. Children with disabilities in these studies were identified as having communication disorders or speech impairments, developmental delays, cognitive or intellectual disabilities, hearing impairments or visual impairments, physical impairments, or social-emotional delays. The participants in the studies were mainly categorized in the mild to moderate range of functioning. The ages of the participants ranged from 2 to 9 years with the majority being 3 to 4 years.

Intervention Studies: Design, Types of Interventions, Dependent Variable and Measurement

Studies included in this literature review represented interventions that manipulated toy sets or group composition.

Design. The body of studies consisted of four different types of designs: (1) alternating treatments design (2) multiple baseline design (3) Post-test only control group design and (4) 3x2 mixed factorial design.

Types of intervention. Studies included in this synthesis compared the effects of manipulating toys or group composition. For the purpose of this review the findings of the literature were grouping into two categories: (1) toy effect (social vs. isolate n=4; mixed vs. doll vs. vehicle n=1; adaptive vs. ordinary n=1) (2) group composition and toy effect (functional vs. constructive vs. dramatic in mixed vs. unmixed groups n=1; social vs. isolate in mixed or unmixed group setting n=1; social vs. isolate vs. mixed in mixed vs. unmixed groups n=1).

Dependent variable and measurement. Level of play and interactions with peers was the dependent variable in eight of the studies included. Two of those studies also included toy preference as one of their dependent measures. The other study measured only the socially appropriate use of the toy. Social behavior in all studies was measured using an observational coding system. Social behavior was primarily quantified by frequency counts of either social interactions or cognitive level of play or both in all but one study.

Hsieh (2008), defined appropriate participation as when participants used the tools in the right way, or when a participant responded correctly to game play. Appropriate participation meant socially acceptable toy manipulation and remaining within a designated area until the task was completed. Two of the studies (Ivory &McCollum, 1999; Cowden & Torrey, 1990) used Parten's Scale of Social participation while in other studies social interaction was recorded as initiating or responding with vocalizations or words while being close, next to or facing another child and gestural interactions were defined as initiating or responding with a gesture such as pointing, waving, showing a toy (Hughes & Carter, 2002; Kallam & Rettig, 1992). Malone and Langone (1998) measured 12 dependent variables including nonplay, exploration, functional, constructive, dramatic (categorical play) single scheme, unordered multischeme, and ordered multischeme (sequential play). The authors operationalized each of these measures.

Findings

Researchers reported effects that fall into two categories: (1) toy effect and (2) group comparison and toy effect and the findings are as follows.

Toy Effect. Cowden and Torrey (1990) reported a majority of the children played more frequently with social toys (67%) than isolate toys (33%). Further, gross motor toys were preferred over fine motor toys and the data did not indicate a dependent relationship between toy

preference and gross motor or fine motor ability. Most of the play that the children engaged in was nonsocial (83.8%) while only 16.1% of the play was social. The study by Hughes & Carter (2002) showed no significant difference in social interactions between social and isolate toy conditions. They did however note an important difference they were not initially aiming to measure. The children in the study showed more social interactions with their typically developing peers during the social toy condition and more social interactions with their peers with special needs during the isolate toy condition. Ivory and McCollum's (1999) study reported results that differed from the two previous studies. The results indicated that while parallel play was most often seen with both toy sets, cooperative play was more likely when social toys were available than when they were not. In contrast, parallel play strongly dominated when isolate toys were available. Isolate play was relatively low in both conditions. Kallam & Rettig (1992) showed similar results to this. For all participants there was an increase in the amount of social interactions observed during social toy conditions over isolate toy conditions. The authors observed an even higher increase of social interactions during the social toy phase in the five-year-old children versus the three and four year old children; there was no difference seen between the three and four year olds.

Hseih (2007) looked at toy sets that were ordinary vs. adaptive rather than social vs. isolate and gathered data regarding the socially appropriate use of the toys. Her results indicated that during the adaptive toy intervention phase there was an increase in the socially appropriate use of toys. The increase in the gains was immediate and significant. During maintenance/generalization phases they also saw retention of socially appropriate toy use. Malone & Langone (1998) looked at vehicle, doll, and mixed toy sets and the effects between genders, toy set main effects, and within toy sets. The results indicated that boys engaged in

more exploration play with the doll or mixed toy set equally. Girls engaged in more exploratory play with the mixed toy set with no difference observed between the doll and the vehicle set. More pretend play was seen with the doll set with both boys and girls. Girls also exhibited more ordered multischeme sequences while playing with the doll toy set with no significant difference found for the boys. The toy set main effects showed that children engaged in more functional play with the vehicle toy set than the other toy sets. More constructive play was observed with the vehicle and mixed toy set. Overall, children spent more time playing with the vehicle toy set than with the other sets and the play sequences were longer. They observed similar patterns within each toy set. In addition, the use of the vehicle toy set resulted in more functional and constructive play. The use of the doll toy set resulted in more functional and pretend play and the use of the mixed toy set resulted in more nonplay than exploration and more constructive play than pretend play.

Toy effect and group comparison. Beckman and Kohl (1984) manipulated social and isolate toy sets and integrated and nonintegrated groups to answer five research questions: (1) Is there a difference in the frequency of interactions among preschoolers as a function of the type of toy available? According to the findings of this study, most of the social interactions occurred when social toys were available in both the integrated and nonintegrated groups. (2) Is there a difference in the frequency of interactions as a function of whether the group was integrated or nonintegrated? The findings for this question showed that for both classrooms the integrated groups interacted more than the nonintegrated groups. They also examined how many of those interactions were done by the children with special needs. Classroom I showed that the children with special needs accounted for 20% of the intervals observed and 39% of the intervals observed in classroom II.

(3) Is there a difference in the amount of time preschoolers engage in toy play as a function of the type of toy available? The findings for this question indicated that toy play increased when isolate toys were available followed by mixed and then social. This was the same for the integrated group in classroom I and the nonintegrated group in classroom II. In classroom I's nonintegrated group, toy play was the same in isolate and mixed condition and reduced in the social condition. This difference was not significant. In classroom II's integrated group the social toy condition showed the most toy play with isolate and mixed having only minimal differences.

(4) Is there a difference in the amount of time preschoolers engage in toy play as a function of whether the group was integrated or nonintegrated? Results indicate the children in nonintegrated groups played with toys more than the integrated groups with the substantial differences being seen only in the social toy condition.

(5) Were any toys associated with more play than other toys? The toy preferences seen between groups and play conditions were variable with play dough being the only consistently preferred toy item during the isolate toy condition but not during the mixed toy condition.

McCabe et. al. (1999) also observed the effects of group composition, materials, and developmental level on play. The data indicated that the effect of group composition was not significant, nor was the interaction between group comparison and play materials. They did see a significant difference in the amount of time engaged in play, based on the category of play materials. The play materials were categorized as functional, constructive, and dramatic with functional materials resulting in the highest amount of time engaged in play. The data also revealed that functional play was observed more frequently with functional materials, constructive play was observed more with constructive materials, and dramatic play was observed more with dramatic materials. They found that developmental scores correlated

negatively with the overall amount of functional play. A third study in this synthesis addressed the effects of toys as well as group composition, Martin et. al. (1991) found that integrated groups exhibited more social behavior than nonintegrated groups. For both groups, more social behavior was observed during social toy set condition than isolate toy set condition. The most social behavior observed was during the social toy set condition in the integrated group and conversely the least social behavior was observed during the isolate toy set condition in the nonintegrated group.

Based on the literature reviewed here we know that manipulating toy sets can increase social interactions in children with disabilities. The studies reviewed also showed that social toy sets were the most effective at increasing social interactions. This study adds to the literature by looking specifically at the communication aspect of social interactions described here as social verbal interactions.

The purpose of this study aimed to contribute to the body of research that has been conducted by comparing social toy set versus isolate toy sets by specifically examining the communication/verbal aspect of social interactions. The specific research question that will be addressed is: What effect does manipulating toy sets have on the social interactions of preschool aged children with special needs and their typically developing peers? This question is important to answer with the expanding inclusive preschool programs and the new laws that require teachers to use research based practices as outlined in legislation such as No Child Left Behind. As discussed earlier the importance of social interactions to the developmental domain is something that teachers must consider, especially when trying to increase social interactions between all children with and without disabilities.

Chapter 2

Methods

Participants

The participants in this study were included based on their enrollment in the researcher's classroom. There were a total of 17 children in the classroom with eight identified as having developmental delays. Of the 8 identified in the classroom as having developmental delays, 5 were originally included in the study: 3 males and 2 females. Once data collection began one student was omitted from the study due to frequent absences. Criteria to participate in the study included: the ability to communicate verbally prior to the start of the study that allowed them to initiate and respond to social interactions and a minimum of one Individualized Education Plan (IEP) goal/objective that addressed the area of social/emotional development. This was assessed by the teacher's and researcher's observation, review of student's IEP's and the researcher's prior knowledge of the students. A description of each participant follows. The students with developmental disabilities who were not included in the study were non verbal or did not have an IEP goal/objective addressing the social/emotional developmental domain.

John. John was a 3-year 7month old male diagnosed under Significant Developmental Delay (SDD) in the areas of adaptive, communication/language, and social/emotional as well as a speech and language impairment diagnosis. He was able to follow simple 1-step directions and enjoyed adult attention. John communicated primarily with sign language but was able to communicate verbally using single words and short phrases. His use of sign language as a primary means of communication was due to a severe articulation delay. John's favorite activities during center time were reading books with an adult or playing with dinosaurs. He also enjoyed playing in the block center with trucks and cars. He had difficulty transitioning between

activities and needed much adult support to do so smoothly. John showed some engagement with his peers during center time indoors and free play outdoors and preferred to either play independently or with an adult though he would respond to peer's initiations to play. On the Learning Accomplishments Profile –Diagnostic Standardized Assessment (LAPD) in the area of language naming and comprehension he scored –2.33 standard deviation (SD) below the norm and on the Social Skills Rating Scale he scored –2 SD below the norm.

Timothy. Timothy was a 3 year 8 month old male diagnosed under SDD in the areas of fine motor, social/emotional, cognitive, and communication/language as well as a speech and language impairment diagnosis. Timothy could follow simple 1-step directions with minimal prompting. He typically wandered around the room during free play and engaged in solitary or parallel play for short periods of time. He frequently responded to other student's initiations and he responded to teacher prompts to ask to play with another child but was quickly distracted. Timothy enjoyed being outside over other activities but usually played alone with a ball or on a bike. On the Battelle Developmental Inventory-2nd Edition (BDI-2), he scored a Personal-Social Domain Developmental Quotient of 73, rating: delay. On the LAPD in the area of cognition he had a standard score of –2.33.

Hannah. Hannah was a 3 year 7 month old female diagnosed under SDD in the areas of language/communication, cognitive, and social/emotional as well as a speech and language impairment diagnosis. She was able to make requests of others, however not in question form. She followed 1 and 2 step verbal commands with minimal prompting and generally follows the classroom routine. She exhibited difficulty with answering/asking "wh" questions, expressing functions of objects, as well as recognizing/naming prepositions. Hannah has certain peers that she prefers and generally limits her interactions to these students and adults.

Peter. Peter was a 3 year 9 month old male diagnosed under SDD in the areas of social/emotional, cognitive, and communication/language as well as a speech language impairment diagnosis. Peter enjoyed looking at books and playing with balls outside. He also enjoyed art activities and frequently requested to paint. Peter initiated most interactions with adults and occasionally initiated interactions with his peers. He responded consistently to peer's initiations but had a limited attention span ranging from less than one minute to two minutes depending on the activity. In the area of social emotional development, Peter scored –1.56 SD on the Developmental Assessment of Young Children (DAYC) and –2.33 SD on the BDI-2. On the LAPD, in the area of cognition he scored –1.40 SD and –2.33 on the BDI-2. His communication scores also were considered delayed as he scored –1.88 on the LAPD and –1.88 on the BDI-2.

The typically developing children in the classroom are enrolled in the center based on income as the program is designed to meet the needs of low-income families. They are all between the ages of three years five months and four years. Of the nine typically developing children five were chosen to participate based on their average to above average verbal and social abilities. This was determined based on teacher observations.

Setting

The setting for the study took place in an inclusive preschool classroom located in rural northeast Georgia. Three paraprofessionals worked in the classroom as well as one general education teacher and one special education teacher. The special education teacher was the primary researcher. The classroom was organized with six centers including a block area, dramatic play/kitchen, library, science, math, and manipulatives area. There was also a large circle time/calendar area. A diagram of the classroom can be found in Appendix A. The centers that the students played in during the social toy phase included block and dramatic

play/housekeeping centers. The centers that the students played in during the isolate toy phase included book and manipulatives centers. The block, dramatic play/housekeeping, and manipulatives center each were approximately 6 ft by 10 ft while the book center was approximately 8 ft by 8 ft. Each center contained shelving with all materials within easy reach of the children. The children were visible from all areas in the room by the teachers. The general education co-teacher and one paraprofessional supervised all students in the class that were nonparticipants. The two other paraprofessionals in the room supervised the children who participated in the study.

All of the participants were familiar with the classroom where the research took place as well as with the adults and arrangement of the room. This helped to guard against adaptation effects. The social and isolate toy sets used in the study were familiar to the participants in that they had played with those types of materials before (puzzles, books, etc) if not the exact ones used in the study.

Permission to participate in the study was obtained from the parents/guardians via a form sent home that requested their signature. The parents of the students not participating in the study also received a letter to explain what was going to occur in the classroom so that they would be aware. Prior to the letters and permission forms being sent home the researcher spoke with each parent individually to answer any questions or concerns that they may have had regarding the study and remained available throughout the duration of the study for any further questions.

Materials

The toys that were made available during the each of the experimental phases are outlined in Table I. The toys used in the study were toys that are typically found in a preschool classroom and were the only toys made available to the students during the sessions. The toys

and toys sets used in this study were determined based on the research of previous authors and replicate the toy sets used by Hughes and Carter (2002). Social toys are defined as toys that lend themselves to interactions between children such as blocks, kitchen, or dress up materials. Isolate toys are defined as toys that lend themselves to individual play such as books or puzzles.

Experimental Design

The study employed an alternating treatments design to compare the effects of social and isolate toys on social verbal interactions. The intervention commenced after three days of baseline. Children were provided with social and isolate toys being made available on alternating days for five weeks with three sessions per week plus one day so that each comparison phase was observed an equal number of times. Following the comparison phase was a best phase that used the toy set that elicited the most social interactions. The procedures in the best phase were the same as the comparison phase.

General Procedures

Social interaction was the dependent variable, specifically social verbal interactions. The target behavior was identified based on the developmental importance of social interactions for young children. The definition of social verbal interaction was based on the definition provided by Martin et al (1991). Verbal interactions were defined as targeted children initiating or responding with vocalizations or words while being close, next to, or facing another child. See Table 2 for examples and nonexamples of social verbal interactions.

Table I

Categorization of social and isolate toys and materials

(Hughes and Carter, 2002)

Class of Toy	Examples	Supporting references
Social toys		
Dress-up clothes	Bags, dresses, hats, Glasses, shoes	Martin *et al.* (1991)
Home corner Materials	Cooking utensils, plastic food	Martin *et al.* (1991) Cowden & Torrey (1990)
Role play materials, Puppet theatre	Fire truck, police truck Puppets	Martin *et al.* (1991); Beckham & Kohl (1984); Cowden & Torrey (1990)
Dolls' house	Dolls' furniture	Rettig *et al.* (1993); Cowden & Torrey (1990)
Toy vehicles	Cars, trucks, helicopters, car mat	Becham & Kohl (1984); Martin *et al.* (1991); Rettig *et al.* (1993)
Construction materials	Building blocks, waffle blocks, wooden blocks	Beckman & Kohl (1984); Cowden & Torrey (1990); Rettig *et al.* (1993)
Dolls and dolls clothes		Cowden & Torrey (1990); Rettig *et al.* (1993)
Isolate toys		
Puzzles	16-piece inset puzzle, big floor puzzles	Beckman & Kohl (1984); Cowden & Torrey (1990); Martin *et al. (1991); Rettig et al.* (1993)
Pegboards	Regular pegboards.	Martin *et al.* (1991)
Art materials	Paper, pens, crayons, nature materials, collage materials	Beckman & Kohl (1984); Cowden & Torrey (1990); Martin *et al.* (1991); Rettig *et al.* (1993)
Picture books		Beckman & Kohl (1984); Martin *et al.* (1991); Rettig *et al.* (1993)
Toy animals	Plastic farm and jungle Animals	Cowden & Torrey (1990)

Table 2

Social verbal interactions

Examples	Nonexamples
Participants facing one another while vocalizing	Echolalia
Participants requesting	Participants facing one another and making noises (e.g. vroom vroom)
Participants greeting	Participants talking to themselves (e.g. "reading" a book out loud)
Participants making verbal exchanges	

The sessions took place during the typical center time of the classroom. The center time lasted for approximately an hour and occurred from 10am until 11am. The observation sessions lasted for 30 min and began approximately 10 min into center time. During the baseline condition observations were recorded using all of the pre-existing toys in the room and included toys from both the social and isolate toy sets. All center areas were made available during baseline. Only one type of toy set (either social or isolate) was made available in each of the comparison sessions after baseline. The toy set that was available varied from day to day with each set being observed a total of eight times. Prior to beginning play, the students were told which toys and center areas were available and which were not. The toys that were not part of the available toy set were removed from the center areas or covered.

During the period of observation, the children were able to move from center to center as long as they played with only the available toys. The remaining students in the classroom were moved to another room to participate in an arts and crafts activity or were taken outside. During all sessions the children were reinforced with verbal praise, social attention, and physical touch (hug, high five, etc.) as is typical in the classroom. They were provided with social praise for behaviors such as cleaning up or following directions. Participants were not given any reinforcement or directives for initiating a social interaction or responding to a social initiation.

When the children approached the teachers and/or researcher they were redirected back to the play area but not specifically to play with the other children. When the children tried to leave the play area, they were redirected back to the center but not specifically to play with the other children. No token reward system was used in the classroom. Children were given stickers for following directions, cleaning up, etc. but the stickers were not exchanged for anything else. This did not change during any of the sessions. When disruptive behaviors occurred, the teachers and paraprofessionals used redirection as their initial response but not specifically to play with the other children. When the behaviors were harmful to the student or others, the participant was removed from the area and the session was ended and not counted. No sessions were required to end early because of disruptive behavior. John has one less best phase session than the other participants due to absence.

Measurement.

A partial interval recording procedure was used due to the low occurrence and short duration of the target behavior. If any instance of the behavior occurred at any point during the interval it was counted as an occurrence. The intervals were 15s in length. The interval length was determined by initial observations done prior to baseline. Intervals were marked by beeps on a prerecorded cassette tape. The observers wore a headset connected to the tape recorder. One of the targeted children was observed for ten 15 second intervals. There was subsequently a five second break and the second child was observed for ten 15 second intervals. This process was repeated until each child had been observed three times. Each child was observed for a total of 7.5 min per day for 3 days over a 5-week period. The other teacher and paraprofessionals in the classroom had the procedures explained to them so that they followed them correctly. Data were

calculated as a percentage of available intervals. See Appendix B for interval recording data sheets.

Reliability

Reliability data were collected on the percent interval occurrence for social verbal interactions and procedures during the intervention and best phase sessions. Inter-observer agreement was collected at least once per condition for a minimum of 25% of sessions. The primary observer was the first researcher and the secondary observer was a paraprofessional with 7 years experience working with children with special needs. The first observer trained the second observer by observing the children in the classroom for 15-minute segments and recording the observations on data sheets and then comparing the results. The recording procedures and data sheets used during training were identical to the procedures used during the study. Point by point agreement was calculated for the occurrence of social interaction. Once IOA reached a minimum of 98% over 3 consecutive training sessions the training ended. During sessions with IOA observations, both observers independently observed and recorded occurrences and non-occurrences of behaviors. Point by point agreement was calculated for the occurrence of social verbal interaction per interval. IOA was calculated by dividing the number of agreements by the number of agreements plus disagreements and multiplying by 100. An agreement was when both observers simultaneously coded the same behavior in the same interval. A disagreement occurs when both observers code different behavior in the same interval. Occurrence agreement was calculated for the number of agreements on the occurrence of social interaction. IOA was calculated by dividing the number of agreements by the number of occurrences and multiplying by 100. See Appendix C for interobserver reliability data collection sheet.

Procedural reliability data were collected at least once per condition for a minimum of 25% of sessions to ensure that intervention procedures were followed with accuracy. Data were collected on teacher behavior that included: redirection and any verbal directions given by the teachers to the students to ensure that students were not redirected to play with their peers or to initiate a social interaction. Data were also collected on the toys available to students to make sure they fell into the correct category of either social or isolate according to the session. The same paraprofessional collecting interobserver reliability data also collected procedural reliability data. See Appendix D for procedural reliability data collection sheet.

Social Validity

After the research was completed, the parents and teachers (other than the researcher) in the classroom were asked to complete a short questionnaire using a Likert Scale regarding the procedures and results of the study (Appendix E). The forms were made as anonymous as possible given the small number of people who responded. These data are important to see if educators and parents feel that the practice of using different types of toys sets to increase social interaction is effective and if it aligns with their philosophies regarding early childhood education. The data are reported anecdotally.

Chapter 3

Results

For each student the number of verbal interactions that occurred in each comparison phase were graphed and analyzed according to the following dimensions. Within each condition median and range were calculated In addition percent overlap were computed between conditions. Each graph displays the number of intervals each participant was engaged in social verbal interactions per session for each condition.

Data are plotted on Figures 1 thru 4. Table 3 summarizes the results for each participant per condition. The results indicate that during alternating treatments, social toy sets in isolation illicit more verbal interactions than isolate toy sets in isolation for all participants.

Procedural reliability of teacher behaviors was taken for 42% of sessions and procedural reliability of toy availability was taken for 100% of sessions. It ranged from 91% to 100% with a mean of 97% for teacher behaviors and was 100% for toy availability.

The total percentage of sessions that Interobserver agreement was taken was 54.5%. It ranged from 96.7% to 100% for point by point agreement with an average of 99.4%. Occurrence agreement ranged from 85.7 to 100% with an average of 98.7.

Figure 1

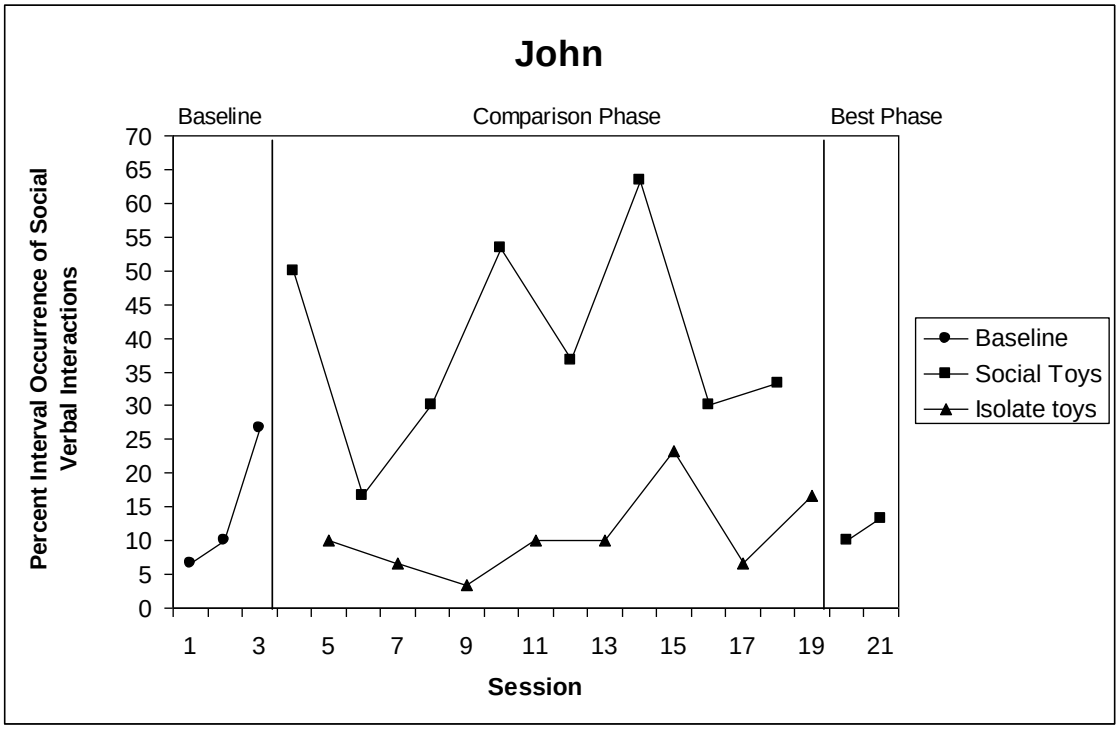

Figure 2

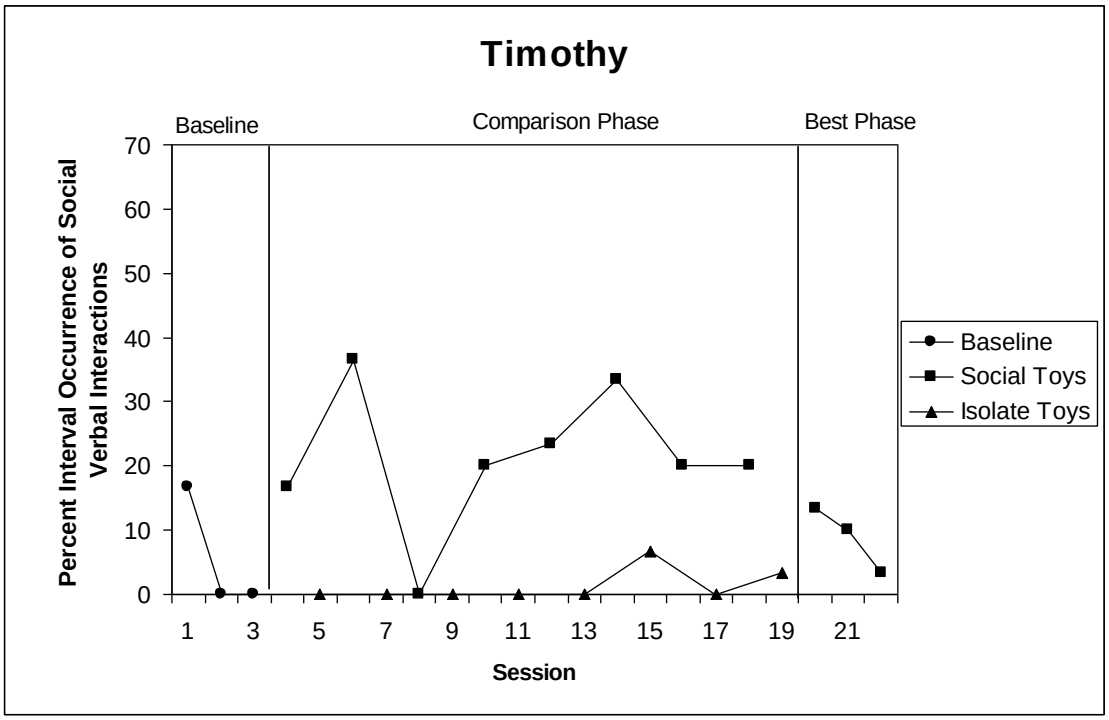

Figure 3

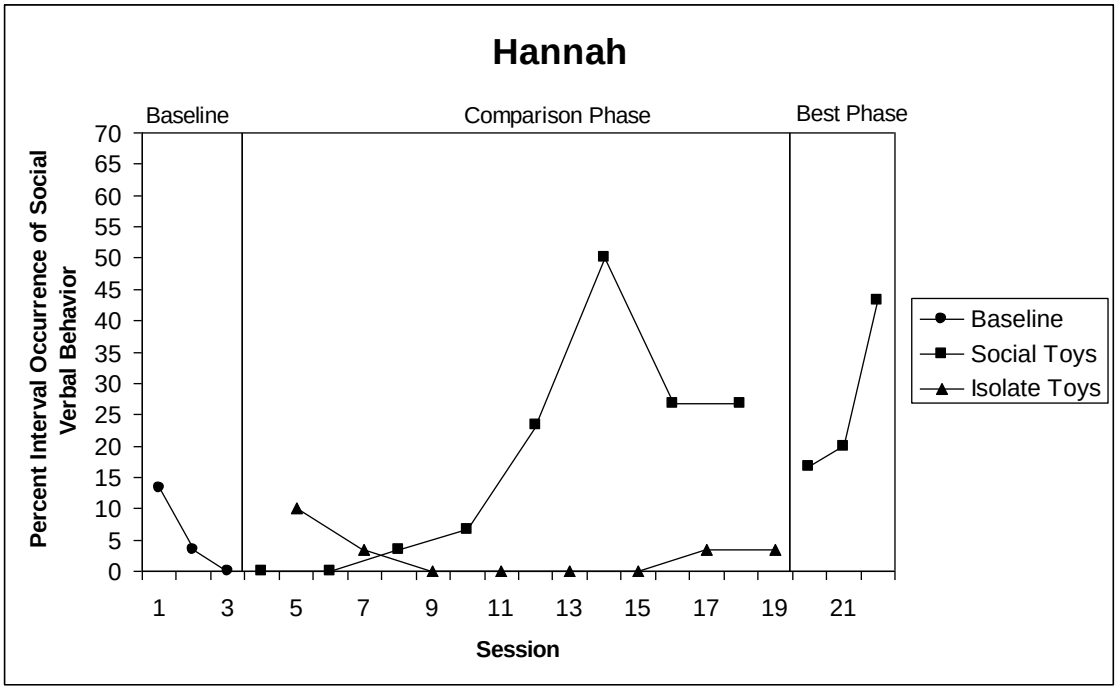

Figure 4

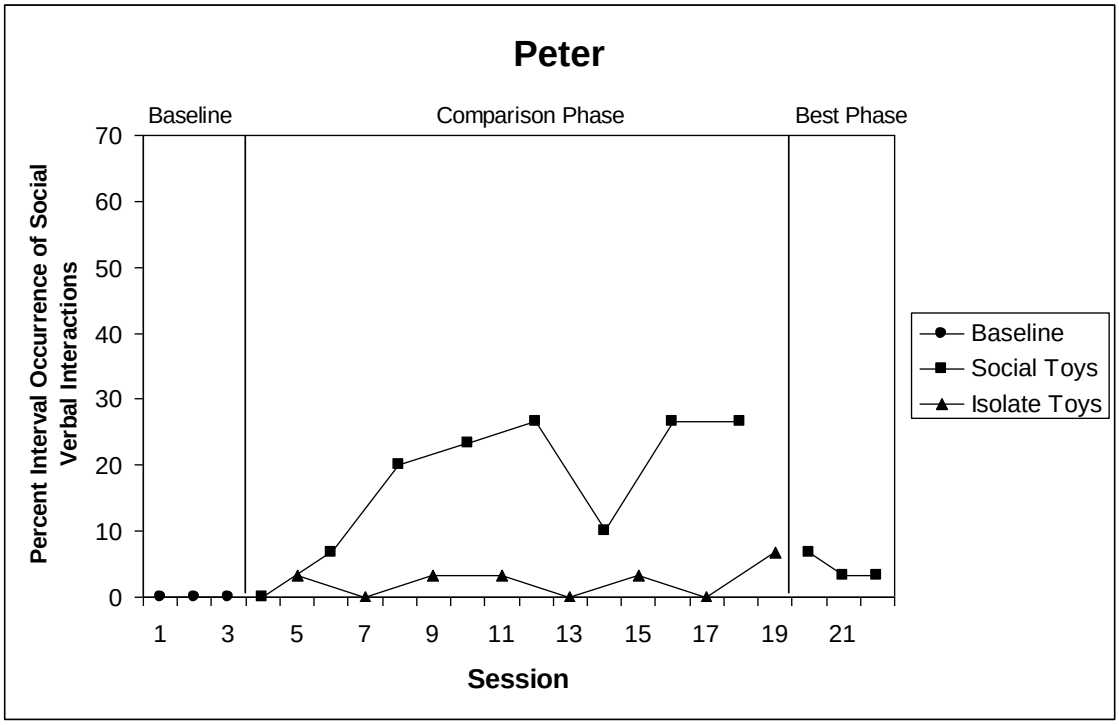

Table 3

Mean, Median, and Range of Percent Interval Occurrence of Social Verbal Interactions Made by Each Student per Condition

	Baseline	Social Toys	Isolate Toys
John			
Mean	14.45	39.17	3.25
Median	10	35	10
Range	6.67 to 26.67	16.67 to 63.33	3.33 to 23.33
Timothy			
Mean	5.56	6.38	1.25
Median	0	20	0
Range	0 to 16.67	0 to 36.67	0 to 6.67
Hannah			
Mean	5.55	17.08	2.5
Median	3.33	15	1.67
Range	0 to 13.33	0 to 26.67	0 to 10
Peter			
Mean	0	17.5	2.5
Median	0	21.67	3.33
Range	0	0 to 26.67	0 to 6.67

During baseline John had 3 observations with a mean of 14.45, median 10 and a range of 6.67 to 26.67. After baseline, there were 8 observation sessions for each toy condition. The mean percent interval occurrence of social verbal interactions for the social toy condition was 39.17, median 35, and range 16.67 to 63.33. The mean percent interval occurrence of social verbal interactions for the isolate toy condition was 3.25, median 10, and a range of 3.33 to 23.33. A visual analysis of the graph shows that there is minimal percent overlap between the social and isolate toy sets. The best phase had a mean of 11.67, median of 11.67, and range of 10 to 13.33.

During baseline Timothy had 3 observations with a mean of 5.56, median 0 and a range of 0 to 16.67. After baseline, there were 8 observation sessions for each toy condition. The mean percent interval occurrence of social verbal interactions for the social toy condition was 6.38, median 20, and range of 0 to 36.67. The mean percent interval occurrence of social verbal interactions for the isolate toy condition was 1.25, median 0, and a range of 0 to 6.67. A visual analysis of the graph shows that there is minimal percent overlap between the social and isolate toy sets. The best phase had a mean of 8.89, median of 10, and range of 3.33 to 13.33.

During baseline Hannah had 3 observations with a mean rate of 5.55, median 3.33 and a range of 0 to 13.33. After baseline, there were 8 observation sessions for each toy condition. The mean percent interval occurrence of social verbal interactions for the social toy condition was 17.08, median 15, and range of 0 to 26.67. The mean percent interval occurrence of social verbal interactions for the isolate toy condition was 2.5, median 1.67, and a range of 0 to 10. A visual analysis of the graph shows that there is minimal percent overlap between the social and isolate toy sets. The best phase had a mean of 26.67, median of 20, and range of 16.67 to 43.33.

During baseline Peter had 3 observations with 0 social verbal interactions. After baseline, there were 8 observation sessions for each toy condition. The mean percent interval occurrence

of social verbal interactions for the social toy condition was 17.5, median 21.67, and range of 0 to 26.67. The mean percent interval occurrence of social verbal interactions for the isolate toy condition was 2.5, median 3.33, and a range of 0 to 6.67. A visual analysis of the graph shows that there is minimal percent overlap between the social and isolate toy sets. The best phase had a mean of 4.44, median of 3.33, and range of 3.33 to 6.67.

All of the parents and teachers filled out and returned the social validity questionnaire. The responses were positive for both teachers and parents, which provides social validity that is crucial in the validity and success of this study. Using a Likert scale with 1 meaning strongly disagree, 2 disagree, 3 neutral, 4 agree, 5 strongly agree, teachers answered seven questions and parents answered five. The responses from the teachers ranged from 4 to 5 for all questions. Two teachers responded with a 4 and two with a 5 when asked if the intervention was easy to implement in the classroom. The same response was given when the teachers were asked if they would continue to implement the procedure in their classroom. When asked if they believe that the parents of their students would feel comfortable with the intervention two responded with a 4 and two responded with a 5. All of the teachers responded with a 5 in response to if the intervention was developmentally appropriate for their students. Two teachers responded with a 4 and two responded with a 5 when asked if the intervention aligned with their philosophy on education as well as if the goals and results were important to them as educators.

The responses from the parents ranged from 3 to 5 for all questions. When asked if they felt their child benefited from participating in the study one parent responded with a 3 two responded with a 4 and two responded with a 5. Three of the parents responded with a 4 when asked if they would feel comfortable with their child's teacher continuing to use the intervention in the classroom and two responded with a 5. When asked if the intervention aligned with their

personal philosophy on education one parent responded with a 3, two parents with 4 and two parents with a 5. Two parents responded with a 4 and three parents responded with a 5 when asked if the goal of the intervention was important to them. One responded with a 3, two responded with a 4 and two responded with a 5 when asked if the results of the research were important to them as parents.

Chapter 4

Discussion

Based on the results of this study it can be concluded that social toy sets in isolation elicit higher numbers of verbal interactions in preschool aged children with special needs than isolate toy sets in isolation when compared during alternating treatments. However these results did not hold during the best phase social toy condition.

These findings are important for practice because this is a technique that would be considered non intrusive, improve the ease in which educators can increase the social interactions of children with special needs. As discussed previously, social verbal interactions play a vital role in development; this implies increasing social interactions could aid a child's progress in the developmental domains. Using toys as instructional tool is a staple in preschool curriculums, which results in ease of implementation and positive outcomes. It is also important to note that even though social toys are more effective at eliciting social interactions, isolate toys still serve a useful and necessary purpose in the classroom and some instances of social interactions were observed within the isolate toy sets. Since both procedural reliability and interobserver agreement were above 90% for all sessions and phases it can be concluded that the data are reliable and valid.

The results of this study extend the knowledge that was gathered from other similar studies regarding the influence of toys on social verbal interactions including Ivory & McCollum (1999) as well as Kallam & Rettig (1992). Both found that more social interactions were observed during the social toy condition than during the isolate toy condition. Other research that is consistent with the findings in this study include Beckman & Kohl (1984) and Martin et. al. (1991). Unlike Hughes & Carter (2002) who observed no significant difference in social

interactions between social and isolate toy conditions, this study observed an increase in social verbal interactions during the social toy set for all participants.

During the intervention sessions, the primary researcher made several anecdotal observations about the interactions that occurred between the students with disabilities and their typically developing peers. The social verbal interactions that were observed during the sessions were most frequently the result of a typically developing peer's initiation and then the participant responded. The participants in the study would occasionally initiate a social verbal interaction but the majority were responses to others initiations. This is an important fact to note and further research should be done to explore if manipulating toys sets increased the typically developing children's social verbal interactions and initiations which in turn affected the social verbal interactions of the children with disabilities. The participants interacted with both their typically developing peers as well as the other participants though this varied by participant. Hannah and Timothy most frequently interacted with each other while John most frequently interacted with one typically developing peer. Peter was observed interacting with different peers throughout the sessions.

The results of this study should be interpreted with caution given the numerous confounding variables that may have impacted the social verbal interactions of the participants. Potential confounding variables include the number of students present during baseline versus the isolate and social toy conditions as well as during best phase, the slight change in physical space, and the number of toys available between baseline and the alternation of toy sets. Another limitation in this study includes the participants adjusting to the primary researcher, who was also their teacher, not being available during center time. Many approached the researcher during observation sessions and tried to engage with her or would simply sit by the researcher's chair.

Hannah, for example, was very distracted by the researcher and would stop and stare, especially during intervals that she was being observed. Some of the other students would also try to bring toys to the primary researcher and attempt to initiate interactions. Many of the students would also become agitated when certain toys were not available. Timothy had an especially difficult time when the cars in the social toy set were not available and would frequently refuse to play during the beginning of the isolate toy session. On some occasions, the students became upset when their classmates were removed to another activity or left the room prior to beginning the session. This may have resulted in a decreased number of verbal interactions at the beginning of sessions. All of these factors may have contributed to the amount of social verbal interactions seen during each session.

An unexpected finding was the decrease in social verbal interactions seen during the best phase. Hannah's data appears consistent with what was seen during the social toy phase while the other three student's data are not. John was out of school for the first two days of the week in which best phase data were taken. He returned to school during the second session of best phase data but he was still not feeling well. This may have contributed to the decreased amount of social verbal interactions observed during the best phase for John. The week that best phase data were taken was the second to last week of school. At this time during the year, the Head Start facility was under review by their corporate office and several different and unknown individuals were frequently entering the classroom before, during, and after the start of the first session. These individuals remained in the facility through the week. A birthday party was held in the afternoon on the day of the second session during the best phase. This change in schedule and routine may have also contributed to the decrease in social verbal interactions during best phase.

Several questions emerge from the results of this study that can guide future research. Are specific social toys within the toy set more effective at eliciting social interactions when compared to other social toys? Are students with special needs more likely to have an increased number of social interactions with other children with special needs or with their typically developing peers? Does the amount of toys available in the classroom centers have an effect on social interactions? What levels of play are the children participating in for each toy set?

This research suggests that manipulating toys sets correlates with a change in the amount of social verbal interactions in children with disabilities. More research should be done to address the previously stated limitations and questions but the results of this study and others provide a base for educators to begin using different toy sets as a means to increase verbal interactions between their students. With the increase in inclusive settings manipulating toys sets could become a powerful tool to increase verbal interactions between young children with disabilities and their typically developing peers in an easy and nonintrusive means.

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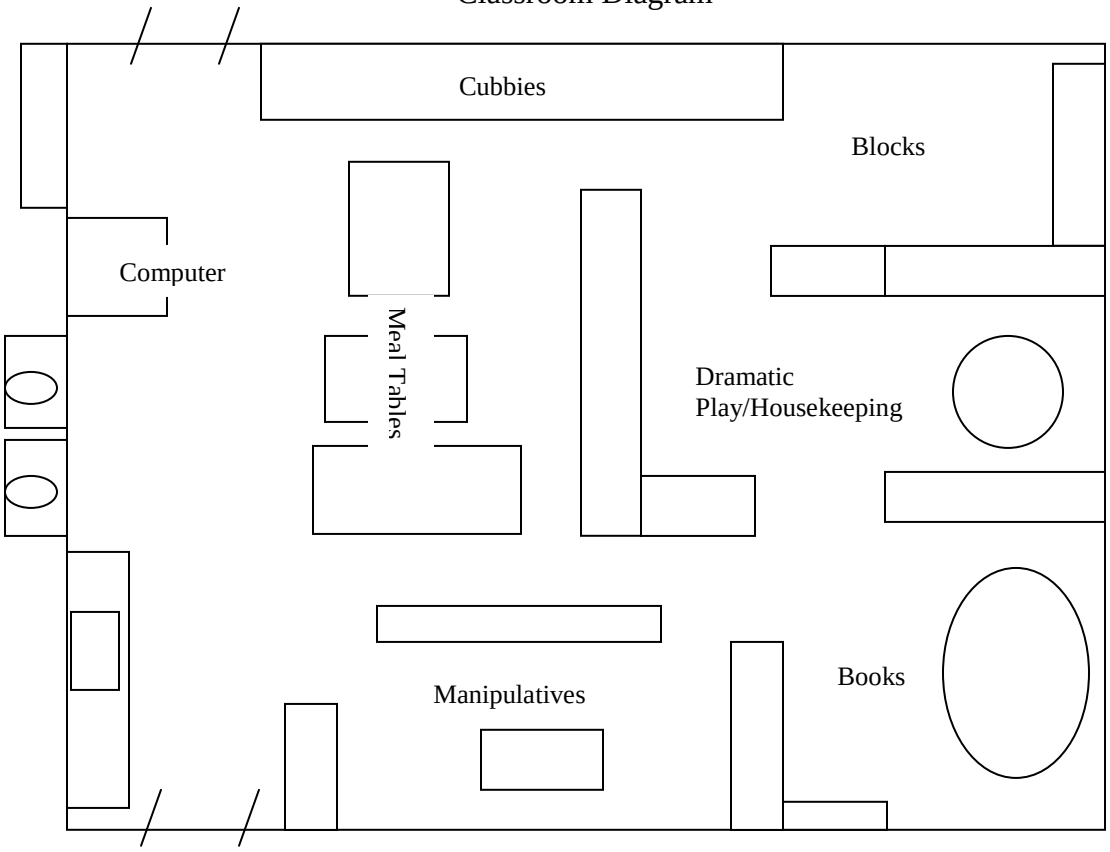
Appendix A

Classroom Diagram



Appendix B

Interval Recording Data Sheet

Student: ___________________________ Date: ________________________

Observer: __________________________ Condition: ___________________

Key: Occurrence +; Nonoccurrence –

Directions: Place a + in the box of each interval if social interaction occurs at least one time and at any point during the 15s interval. Place a – in the box if there is no occurrence of social interaction during the 15s interval.

Start Time: _____________ Stop Time: ____________

1	2	3	4	5	6	7	8	9	10
15s	15s	15s	15s	15s	15s	15s	15s	15s	15s

Start Time: _____________ Stop Time: ____________

1	2	3	4	5	6	7	8	9	10
15s	15s	15s	15s	15s	15s	15s	15s	15s	15s

Start Time: _____________ Stop Time: ____________

1	2	3	4	5	6	7	8	9	10
15s	15s	15s	15s	15s	15s	15s	15s	15s	15s

Summary:

Number of Occurrences: ___ Percentage of Occurrences: ___

Number of Nonoccurrences: ___ Percentage of Nonoccurrences: ___

Appendix C

Interobserver Reliability

Date: __________ **Primary Observer: __________________________**
Session: ___________ **Secondary Observer: ________________________**

Point by Point Agreement

_____# of agreements______ = _____________ x 100 = %
agreements + disagreements

Occurrence Agreement

# of agreements = ____________ x 100 = %
# of occurrences

Date: __________ **Primary Observer: __________________________**
Session: ___________ **Secondary Observer: ________________________**

Point by Point Agreement

_____# of agreements______ = _____________ x 100 = %
agreements + disagreements

Occurrence Agreement

# of agreements = ____________ x 100 = %
# of occurrences

Date: __________ **Primary Observer: __________________________**
Session: ___________ **Secondary Observer: ________________________**

Point by Point Agreement

_____# of agreements______ = _____________ x 100 = %
agreements + disagreements

Occurrence Agreement

# of agreements = ____________ x 100 = %
# of occurrences

Date: __________ **Primary Observer: __________________________**
Session: ___________ **Secondary Observer: ________________________**

Point by Point Agreement

$$\frac{\text{\# of agreements}}{\text{agreements + disagreements}} = \_\_\_\_\_ \times 100 = \%$$

Occurrence Agreement

$$\frac{\text{\# of agreements}}{\text{\# of occurrences}} = \_\_\_\_\_ \times 100 = \%$$

Appendix D
Procedural Reliability

Teacher Behaviors

Observer: _____ Participants:_____

Directions: When there is an occurrence of redirection place a check in the appropriate column and mark if the direction was to play with their peers or to initiate a social interaction in the appropriate column.

Key: + = redirection included direction to play with peer or initiate social interaction
- = redirection did not include direction to play with peer or initiate social interaction

Date: _____	Redirection	Occurrence	Date: _____	Redirection	Occurrence

Procedural Reliability = # of (-) nonoccurrences x 100 =
# of opportunities

Procedural Reliability

Toy Availability

Observer: _____

Directions: Prior to start of session mark if any toys available and uncovered are from a differing toy set than marked.

Key: + = all toys available are from appropriate toy set
- = one or more toys available are not from appropriate set

Date	Session			Toy Availability
	Social	Isolate	Best	
	Social	Isolate	Best	
	Social	Isolate	Best	
	Social	Isolate	Best	
	Social	Isolate	Best	
	Social	Isolate	Best	
	Social	Isolate	Best	
	Social	Isolate	Best	
	Social	Isolate	Best	
	Social	Isolate	Best	
	Social	Isolate	Best	
	Social	Isolate	Best	
	Social	Isolate	Best	
	Social	Isolate	Best	
	Social	Isolate	Best	
	Social	Isolate	Best	
	Social	Isolate	Best	
	Social	Isolate	Best	
	Social	Isolate	Best	

Procedural Reliability = # of (+) occurrences x 100 =
# of opportunities

Appendix E

Teacher Social Validity Questionnaire

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. The intervention was easy to implement in my classroom.	1	2	3	4	5
2. I will continue to implement the intervention after the completion of the study.	1	2	3	4	5
3. I believe that the parents of my students would feel comfortable if I used this intervention in my classroom.	1	2	3	4	5
4. I feel that the intervention is developmentally appropriate for my students.	1	2	3	4	5
5. The intervention aligns with my teaching philosophy.	1	2	3	4	5
6. The goals of the intervention are important to me as an educator.	1	2	3	4	5
7. The results of the intervention are important to me as an educator.	1	2	3	4	5

Parent Social Validity Questionnaire

1. I feel my child benefited from participating in the study.	1	2	3	4	5
2. I would feel comfortable if my child's teacher continued to implement this intervention in his/her classroom.	1	2	3	4	5
3. The intervention aligns with my personal philosophy on education.	1	2	3	4	5
4. The goal of the intervention is	1	2	3	4	5

important to me as a parent.

5. The results of the intervention are important to me as a parent.	1	2	3	4	5