

2014

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## Recommended Citation

Elliott, Kristyn N., "Social interaction of preschool children with developmental delays when playing with higher functioning peers" (2014). *Master's and Doctoral Projects*. 601.  
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Social Interaction of Preschool Children with Developmental  
Delays when Playing with Higher Functioning Peers

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May 2014

This scholarly project reflects individualized, original research conducted in partial fulfillment of the requirements for the Occupational Therapy Doctoral Program, The University of Toledo.

**Abstract**

For individuals with delays, social interaction has been found to be a crucial component to enhancing development. The current study utilized playgroups as a setting for socialization. We introduced trained, higher functioning playmates alone and in combination with reducing sensory stimulation to determine the effects on social interaction. The participants consisted of 14 children with developmental disabilities including intellectual disability, developmental delay, and autism. Participants ranged from the age of three to six-and-a-half with a mean play age of 5.23 years of age. Play age was determined through parent completion of the Takata Play History (Takata, 1974). Social behaviors during playgroup sessions were determined quantifying the occurrence of both desirable and undesirable behaviors. There were no statistically significant differences. Findings from this study suggest that the introduction of higher functioning playmates alone or in conjunction with reduced sensory stimulation does not have an effect on social behavior. As a result of the inconsistency with the published research, further research is warranted.

### **Social Interaction of Preschool Children with Developmental Delays when Playing with Higher Functioning Peers**

Interaction with peers provides several benefits for children. It enhances knowledge about social norms and provides an opportunity for children to experience a variety of roles, such as a follower, leader, or organizer (Missiuna & Pollock, 1991). A successful interaction includes initiation by one social partner and response to initiation by another (Tanta, Deitz, White & Billingsley, 2005). One of the most common situations in which children interact with their peers is in play, the primary occupation of children (Missiuna & Pollock, 1991) where occupation is defined as an interaction between a person's performance and his/her outside environment (Nelson, 1988). Supporting social interaction during play is essential for children with developmental disabilities, including autism and intellectual disability, to enhance success (Cosbey, Johnston, & Dunn, 2010).

According to the *Diagnostic and Statistical Manual of Mental Disorders, 5<sup>th</sup> Edition* (DSM), Autism Spectrum Disorder (ASD) is a broad term that encompasses many different disorders (America Psychiatric Association, 2013; Heward, 2009; Howard, 2014). The disorder consists of Asperger's syndrome, pervasive developmental disorders not otherwise specified, pervasive developmental disorders of autistic disorder, and childhood disintegrative disorder (Howard, 2014). Autism is continually on the rise and has become as prevalent as 1 in 68 children being diagnosed (Moisse, 2014). Autism is typically present before three years of age (Centers for Disease Control and Prevention [CDC], 2012). Autism is five times more prevalent in males than in females (CDC, 2012).

ASD consists of two primary features for the child to receive a diagnosis. The first core feature is deficits in interaction and social communication, which include limited eye contact,

decreased interest in communication with peers, and poor use of practical language (Howard, 2014). Howard (2014) describes the second criterion as being limited, repetitive behaviors or interests. This includes hypo- or hyper-responsiveness to sensory aspects, inflexible routines, repetitive speech or motor movements (such as flapping of hands or echolalia), and highly fixed interests (such as obsessions with objects). The level of impairment is determined by the amount of support the individual requires (Howard, 2014). Some examples of the signs and symptoms of autism include social isolation, delayed communication abilities, repetition of words, hand flapping, a lack of response to one's own name, and sensory processing deficits (CDC, 2012). Children with autism between the ages of three and five frequently have many deficits in their language development (Case-Smith & Arbesman, 2008). They often have limited language development or utilize language that lacks meaning (Case-Smith & Arbesman, 2008). Children with autism are reported to ignore language from others and display a lack of focus when background noise is present, which could result from deficits in auditory processing (Tomchek & Dunn, 2007). Young children with autism have difficulty with eye contact and the concept of relating to other individuals (Case-Smith & Arbesman, 2008). They may imitate behavior and movement of others without necessarily having insight to the intended meaning. They may struggle with any changes to routine and unfamiliar surroundings (National Institute of Neurological Disorders and Stroke, 2012). Heward (2009) explained that individuals with autism tend to have difficulty analyzing the emotional state of their peers and regulating their own emotions. In 1994, Restall and Magill-Evans found that social play was less prevalent in children with autism than in children who were typically developing. Smith and Bryan (1999) described difficulty in participating in mutual communication in children with autism. Together, these difficulties create barriers to forming relationships.

Another condition that can result in delayed social skills is intellectual disability, formerly known as mental retardation (Heward, 2009). Intellectual disability (intellectual developmental disorder) involves limitations of mental abilities that impair one's functioning with conceptual, social, and practical tasks (American Psychiatric Publishing, 2014). Practical tasks include self-management, social tasks consist of communication, judgment, and empathy, and conceptual tasks include reasoning, language, memory, and knowledge (American Psychiatric Publishing, 2014). The diagnosis of an intellectual disability tends to be given at a young age, before adulthood (Heward, 2009). Without social interaction skills, children with intellectual disabilities may fall behind developmentally compared to typically developing children.

Children who lack the ability to play may experience secondary disabilities including psychological, social, and emotional disabilities. (Missiuna & Pollock, 1991). Social interaction among children with delays has been a continual area of concern within health care and education. It is important that children with delays express reciprocal communication to enhance their development (Smith & Bryan, 1999). Previous research has explored several ways to enhance social play in children with developmental disabilities. One technique that has been explored is manipulation of the sensory environment. Children with autism frequently have sensory modulation problems, making it difficult to engage within their environments (Smith & Bryan, 1999). Tomchek and Dunn (2007) stated that individuals with autism react to sensory experiences in a very different manner than their peers who are typically developing. They may have impairments in sensory modulation which cause them to experience a disconnection between their internal characteristics and the external requirements of their environment (Tomchek & Dunn, 2007). Dunn (2007) described sensory modulation as how the individual's

brain regulates and accepts the sensory environment surrounding him/her. This may result in children addressing their own sensory needs by shaking their hands or rocking back and forth, thus reducing opportunities for interaction with others (Smith & Bryan, 1999). Unfortunately, this could evolve into a pattern of constant social isolation. Smith and Bryan (1999) mentioned that without suitable attention, stimulation, and orientation, the child will not be able to interact with the environment, including peers, according to social norms. When children are able to appropriately interpret all aspects of the environment while maintaining homeostasis within their bodies, they will be at an advantage of behaving appropriately and thereby enhancing their developmental (Smith & Bryan, 1999). It has been demonstrated that adapting the environment to comply with a child's sensorimotor, emotional, social, developmental, and behavioral needs can potentially enhance the child's overall play (Kahle, 2011).

Multisensory environments (MSE) can serve as an alternative tool to meet children's sensory needs as opposed to self-stimulating behaviors. An MSE is a designated area where all aspects of the room are controlled (Caliste, 2012). For example, the temperature, lighting, space, and sound are all regulated to meet the sensory requirements of the individuals (Caliste, 2012). In an MSE, there are several recommended items to be used to promote sensory modulation. Some items which can be found in an MSE include therapy balls, bouncing equipment, bean bags, ball pits, vibrating toys, and LED light strings (Schaaf, Schoen, Smith Roley, Lane, et al., 2009). Caliste (2012) stated that the overall purpose of an MSE is to promote pleasurable feelings, choice, and interaction that will help increase the possibility of learning and decrease the child's pain, anxiety, and stress. MSEs act as one of many ways that may increase the socialization amongst children with developmental delays (Hidden Angel Foundation, n.d.).

Another technique explored for enhancing play is the introduction of typically developing peers. Tanta, Deitz, White, and Billingsley (2005) measured social interaction of children with developmental delays when playing with peers of varying developmental levels. This study had five participants. For each participant, there were two peers one of which was classified as having higher developmental play skills and one of which was classified as having lower developmental play skills (Tanta et al., 2005). Each participant was engaged in play with each peer, in random order for five to six consecutive days (Tanta et al., 2005). The researchers reported that when children with developmental delays were paired with higher functioning peers, the frequency of initiation and response to initiation was higher than when paired with lower functioning peers (Tanta et al., 2005).

Due to the importance of social play, researchers should not only conduct replication studies, but also to explore the best combination of intervention techniques. Therefore, the following research question was the focus of this study: Will children with developmental disabilities demonstrate more social interactions during playgroups using the technique of providing higher functioning playmates alone and in combination with reducing sensory stimulation by way of a MSE. We tested the following hypotheses: The first hypothesis was that the introduction of higher functioning playmates to playgroups will result in increased play and social behaviors and decreased undesired behaviors. The second hypothesis was that after reducing sensory stimulation, subsequent incremental introduction of higher functioning playmates to playgroups will result in increased play and social behaviors and decreased undesired behaviors.



## **Method**

### **Study Design**

This study employed a counterbalanced experimental design to introduce higher functioning playmates alone and in combination with reducing sensory stimulation. There were two possible orders of session conditions (conditions are described below). Three sessions were being held at each stage. Both sequences began with a baseline condition. In one sequence, higher functioning peers were introduced in sessions following baseline and then subsequent sessions included incremental reduction of sensory stimulation. In the other sequence, reduction of sensory stimulation was introduced in sessions following baseline and then subsequent sessions included incremental addition of higher functioning peers. As they enrolled, participants were assigned to playgroups of three to four members.

### **Participants**

We enrolled participants who were recruited from the community. We sought preschool-aged children with developmental disabilities including diagnoses of autism, intellectual disability, and developmental delay. Participants were at least three years old and as old as six and a half years of age, providing they have not yet begun kindergarten. Exclusion criteria include diagnoses of cerebral palsy and Down syndrome.

### **MSE**

The MSE was designed to provide stimulation appropriate for any individual's varying areas of development, such as: tactile, auditory, visual, and olfactory. The MSE room was approximately 20 x 30 feet and had high ceilings. Within the MSE there were fiber optics, a ball pit, a loft, vibromusic platforms, bubble tubes, a projector displaying various artworks, a marble panel, and several other objects, all of which provided auditory, visual, and tactile simulation.

The MSE also contained toys appropriate for preschoolers including building blocks and other connector toys, books, action figures, plastic food, and magnetic letters. The toys were located in bins in the center of the room. Each bin had a label and picture on the exterior of the container.

### **Conditions**

**Baseline.** In the baseline condition, only research participants (not higher functioning playmates) attended sessions. The baseline sessions occurred in the MSE. During this condition, all MSE objects were activated.

**Higher functioning playmates.** In addition to the participants we recruited eight typically developed peers aged three to seven. In advance of study sessions, the peers attended orientation sessions in which they were provided with hands-on instruction and practice in initiating play and responding to initiations to play with others (see below). During sessions in the *higher functioning playmates* condition, at least one of these peers attended. They were cued to initiate play with participants and reminded to respond to attempts to initiate play made by participants through the use of verbal and nonverbal signals. Higher functioning peers were cued to initiate play with participants if they were not engaged in play with others for at least five minutes.

**Reduced sensory stimulation.** The MSE equipment and toys were the same as in the baseline condition; however, when the participants entered the room all MSE equipment was turned off. Again, the toys were stored in bins in the center of the room. Each toy bin was labeled with a picture on the exterior of the container. All equipment and toys were available to participants and peers by request, assistance, or independent access.

### **Measures**

**Takata Play History (TPH).** The TPH, (Takata, 1974) is a parent interview which gives a picture of a child's past play experiences and overall developmental play level. The TPH is used to gather information about a child's quantity and quality of play with regards to recreation, games, complex and dramatic construction, simple and symbolic construction, and sensorimotor (Bryze, 2008). Takata, 1974 categorizes labels scores between zero and two years old as "Sensorimotor Play," two to four years old as "Symbolic and Simple Constructive Play," seven to 12 years old as "Play Including Games," and 12-16 years old as "Recreation." The eight peers yielded an average play age of 9.4 years old, which is categorized by Takata (1974) as "Play Including Games". The format for the TPH consists of semi structured and opened-ended questions (Takata, 1974). The TPH has an interrater reliability coefficient of at or above .80 (Behnke & Fetkovich, 1984). The test-retest reliability ranged between .410 and .775 (Behnke & Fetkovich, 1984). The TPH had validity of .966 for those without handicaps and .704 for individuals with disabilities (Behnke & Fetkovich, 1984). The TPH was used to describe the play skills of both participants and playmates.

**Playgroup behavior observation.** To capture a description of participants' play and social behaviors during playgroups, we have compiled a set of dependent variables with operational definitions (See Appendix A). Compilation of this set of behaviors was influenced by a review of the literature (Kahle, 2011; Tanta et al., 2005). To allow a range of outcomes, we have included both desirable and undesirable behaviors. The first draft of the behavior observation tool was critiqued by 10 specialists (occupational therapists, a physical therapist, a special education professor, and an early childhood education professor). After reviewing the feedback from the specialists, the behaviors and definitions were adjusted accordingly. We then assessed the utility of the set of behaviors by using it to play and social interaction in a

videotaped playgroup session. As finalized, this measurement tool was used to quantify occurrence of desired and undesired social behaviors during sessions.

### **Procedure**

**Participants.** Parents/legal guardians were asked to provide informed consent for each participant. Participants were asked for verbal assent at the beginning of each session, which was documented by a researcher. Each participant and his/her legal guardian attended an initial individual session. In this session, demographic data was collected, assessments were conducted, and the participants and their caregivers were oriented to the study facility and the study protocol.

**Higher functioning playmates.** Parents/legal guardians were asked to provide informed consent for each playmate. Playmates were asked for verbal assent at the beginning of each session, which was documented by a researcher. Playmates attended a training session, individually or in groups of two. In this session, their caregivers were oriented to the study facility and the higher functioning playmate protocol. The playmates were allowed to explore the play environment in free play for 20-30 minutes while their caregivers completed the TPH interviews. Then the playmates were gathered for hands-on instruction. This instruction was led by a researcher and included reading a storybook about children who are differently abled, discussing the importance of making friends and “being nice”, and practicing inviting others to play and responding to invitations from others to play.

**Playgroup sessions.** When a playgroup was full, researchers worked with families of participants and playmates to schedule sessions via email. Two researchers were present for each session. There were nine sessions for each group, three in each condition. Caregivers were asked not to bring their children to playgroup feeling hungry. Each session began with a 10-

minute portion in which the participants (and playmates, when relevant) arrived, dropped off personal belongings (such as coats), used the restroom under their caregivers' guidance as needed, entered the play room, and separated from their caregivers. Subsequently, the participants (and playmates, when relevant) engaged in free play for a period of 35 minutes. Participants were allowed to engage as they wish within the environment, provided they maintain their safety and the integrity of materials in the environment. Researchers provided redirection (suggesting alternative play opportunities) when children engaged in behaviors that could result in injury to themselves or others. Researchers responded to any initiation attempts on the part of the participants and attempted to invite playmates into the interaction. Five minutes before the end of the free play portion, one researcher announced that the children had five minutes left. At the conclusion of the free play portion, the MSE equipment was turned off and the children assisted in cleaning up the room. Children were then released to their caregivers. In total, sessions lasted 45-50 minutes. Caregivers were able to observe playgroup sessions through a closed-circuit television, as they desired. Playgroup sessions were videotaped from multiple locations in the room to allow for maintenance of fidelity and subsequent offline data analysis.

### **Data Analysis**

In order to be included in data analysis, the participants missed no more than three playgroup sessions. Videotaped social and play behaviors during playgroups were quantified for each participant using the observation sheet in Appendix A. The first five minutes of the free play periods were not used for data collection but rather as acclimation time for the participants. Each participant's behavior was observed for each of the remaining minutes of the 30-minute playgroup session. For each minute, raters marked any behavior observed from the set of behaviors defined on the observation sheet. The numbers of marked instances of desired and

undesired behaviors were totaled. As there were ten desired behaviors, the maximum score was 300; and with six undesired behaviors, the maximum score was 180.

Scores for the first session in each condition were considered acclimation scores and were not entered into data analysis. Scores for the second and third session in each condition were averaged to represent participants' social and play behavior in that condition. This allowed for individual variability in children's behavior from day to day.

Data was tested for normalcy and parametric tests of significance were employed. To test the first hypothesis, mean scores for desired and undesired behaviors from Baseline sessions and Higher Functioning Playmate sessions were compared using paired t-tests. To test the second hypothesis, scores for desired and undesired behaviors from Reduced Sensory Stimulation sessions and Reduced Sensory Stimulation plus Higher Functioning Playmate sessions were compared using paired t-tests. To adjust for performing four t-tests, significance was adjusted from an alpha of 0.05 to 0.0125.

We assessed the inter-rater reliability of the behavior observations. Inter-rater was instructed in the definition of behaviors and shown examples from video. She then rated videos until demonstrating 90% agreement with the researcher. Finally, she independently rated a random 10% of the research video. Inter-rater reliability is reported as the linearly weighted Kappa statistic. The linearly weighted Cohen's Kappa statistic for desired behaviors was 0.98 (excellent agreement) and 0.99 (excellent agreement) for undesired behaviors.

## **Results**

Initially, the study had 16 participants; however, two participants did not attend the minimum number of sessions ( $n=14$ ). The participants ranged in age between three and six and a half years old ( $M = 4.18$ ). The participants consisted of 11 males and three females.

Approximately 57.14% of the participants were of middle socioeconomic status and 71.43% were Caucasian. The participants had an average of 1.57 siblings. A table of the participant's diagnoses can be found in Table I.

A summary of The Takata Play History (Takata, 1974) scores for the participants can be found in Table II. While the participants' average age was 4.18 years, the mean play age was 5.23 years old, which was categorized as "Dramatic and Complex Constructive Play" (Takata, 1974). A summary of the peers' scores can be found in Table III.

After observing the sessions and reviewing the video recordings, the children's actions were scored using the playgroup behavior observation. Hypothesis one stated that the introduction of higher functioning playmates to playgroups will result in increased play and social behaviors and decreased undesired behaviors. There was no statistically significant difference in the number of desired behaviors from the baseline condition ( $M = 20.9$ ;  $SD = 8.7$ ) to the higher functioning peers condition ( $M = 22$ ;  $SD = 13.5$ ,  $n=14$ ,  $p= 0.7$ ). The comparison of the number of undesired behaviors lacked statistical significance from baseline ( $M = 1.1$ ;  $SD = 1.7$ ) to the higher functioning peer condition ( $M = 1.3$ ;  $SD = 2.1$ ,  $n = 14$ ,  $p = 0.8$ ). The average occurrences of desired and undesired behaviors during baseline and with the introduction of higher functioning playmates can be seen, marked  $\alpha$ , in Figure 1 and in Figure 2.

It was also hypothesized that after reducing sensory stimulation, subsequent incremental introduction of higher functioning playmates to playgroups will result in increased play and social behaviors and decreased undesired behaviors. Desired behaviors did not significantly change from the reduced sensory stimulation condition ( $M = 47.9$ ;  $SD = 11.9$ ) to the subsequent incremental introduction of higher functioning playmates ( $M = 42.4$ ;  $SD = 12.7$ ,  $n= 14$ ,  $p = 0.3$ ). There was no statistical significance when comparing undesired behaviors from reduced sensory

stimulation ( $M = 2.6$ ;  $SD = 2.8$ ) to the subsequent introduction of higher functioning playmates ( $M = 3.6$ ;  $SD = 3.2$ ,  $n = 14$ ,  $p = 0.2$ ). The amount of desired and undesired behaviors during reduced sensory stimulation and subsequent incremental introduction of higher functioning playmates to the playgroups can be seen, marked as  $\beta$ , in Figure 1 and Figure 2.

### Discussion

This study explored whether the introduction of higher functioning playmates to playgroups results in increased play and social behaviors and decreased undesired behaviors on its own and in combination with reducing sensory stimulation. The data do not support either hypothesis, suggesting that the introduction of higher functioning playmates alone or in conjunction with reduced sensory stimulation does not have an effect on social behavior. The participants' social initiation, response, communication, imitation, cooperation level, and aggression did not significantly increase or decrease as the result of the conditions. While Tanta and colleagues (2005) found a positive correlation between the introduction of higher functioning playmates and social interaction, the results of the present study are not consistent. There are several potential factors that could have resulted in the lack of significance. The participants did not present with severely delayed play skills, as measured by the Takata Play History (Takata, 1974). Only one third of participants had any delay, with two having a delay of one year and the remaining with a delay of half a year or less. Since play skills were more mature than the participants' average age, it was unlikely that their skills would increase with any intervention. Although the peers attended a training session, there is a chance that their top priority when in the room was playing, rather than attempting to socially interact with the participants. Perhaps, if there were structure within the sessions, such as routine, coordinated activities, facilitation, direction, and instruction, the presence of peer models may have enhanced



social behavior in participants. Had the playgroup experiences been tailored to the participant's play ages or diagnoses, there may have been a different outcome regarding social interaction.

### **Implications**

The findings of this study suggest that the introduction of trained higher functioning peers to a playgroup with children with developmental disabilities has no measurable effect with regards to socialization. While the current study lacks statistically significant results, Tanta et al. (2005) found that socialization can be increased through the use of interaction with higher functioning peers. Due to the results of the previous studies, occupational therapy practitioners may continue to utilize the strategy of interaction between individuals and their higher functioning peers to enhance social interaction at their own clinical judgment.

### **Limitations**

The small sample size acted as a limitation during this study. Before higher functioning peers were introduced, there were still participants who were higher functioning than others in their group. Therefore, it was possible that there was an effect from higher functioning peers during all sessions. This limitation could have been eliminated by using smaller groups and pairing participants and peers based on their developmental and play ages. Several of the participants' behaviors may have been unaccounted for throughout the duration of the study as a result of a camera malfunction. There is a strong possibility that there were no changes in play behaviors with the introduction of higher functioning peers because of a ceiling effect resulting from an overall lack of delay in play skills in participants.

### **Future Research and Conclusion**

Due to the inconsistency of results among various studies, this topic should be investigated further. It would be beneficial to replicate this study using smaller groups who are

matched based on their developmental and play ages. A wider range of play and developmental ages between participants and peers can also be used as a future research concept. Using peers who have older play and developmental ages can act to enhance socialization more so than the range used for the current study.

### **Acknowledgements**

I would like to thank all of the participants, peers, and parents associated with my study. I would like to express my appreciation to the Auto Dealers United for Kids for their generous support to construct the multisensory environment as well as for funding my study. Thank you to my research advisor, Dr. Alexia Metz, for her knowledge and guidance throughout the program. I would especially like to thank my family and fiancé for their unconditional love and support. Finally, I would like to thank The University of Toledo's Occupational Therapy Class of 2014 for their support.

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Table I

*Participant Diagnostic Information*

Participant	Diagnosis
1	Sensory Integration Disorder
2	Autism Spectrum Disorder - NOS
3	Apraxia
4	Autism Spectrum Disorder
5	Speech Delay
6	Sensory Processing Disorder, Developmental Delay
7	Anxiety, Sensory Processing Disorder, Developmental Delays
8	PDD-NOS, Attention Deficit Hyperactivity Disorder, Obsessive Compulsive Disorder
9	Sensory Processing Disorder, Anxiety
10	Autism Spectrum Disorder/Non-Verbal, Apraxia, Sensory Integration Disorder
12	Sensorineural Hearing Loss Bilaterally and Childhood Apraxia of Speech and Limb
13	Developmental Delay
14	Goldenhar's Syndrome, Sensory Processing Disorder, Autistic Traits
15	Cleft Lip and Lip Pits

Table II

*Participants' Scores on The Play History*

Participant Number	Age	Emphasis	Materials	Action	People	Setting	Play Age
1	4.5	2-4	2-4	2-4	2-4	4-7	3.5
2	3	0-2	2-4	2-4	0-2	4-7	2.7
3	4.5	4-7	4-7	4-7	4-7	12-16	7.2
4	3.5	2-4	4-7	4-7	4-7	12-16	6.7
5	3.5	2-4	2-4	2-4	2-4	4-7	3.5
6	4	4-7	2-4	2-4	4-7	4-7	4.5
7	4	4-7	2-4	2-4	7-12	4-7	5.3
8	6.5	4-7	4-7	4-7	7-12	4-7	6.3
9	4.5	4-7	4-7	2-4	2-4	4-7	4.5
10	5	2-4	2-4	2-4	4-7	4-7	4
12	4.5	2-4	2-4	2-4	12-16	12-16	7.4
13	4	2-4	2-4	2-4	4-7	2-4	3.5
14	4	2-4	4-7	2-4	12-16	12-16	7.9
15	3	2-4	4-7	2-4	4-7	12-16	6.2
Average	4.18	3.75	4.07	3.54	6.43	8.36	5.23

Note. Play Age was determined based on the average of the Emphasis, Materials, Action, People, and Setting scores.



Table III

*Peers' Scores on The Play History*

Peer number	Emphasis	Materials	Action	People	Setting	Play Age
1	4-7	12-16	4-7	7-12	2-4	7.5
2	12-16	4-7	7-12	7-12	7-12	9.6
3	12-16	7-12	7-12	7-12	12-16	11.3
4	4-7	12-16	4-7	12-16	2-4	8.4
5	12-16	12-16	7-12	12-16	7-12	12.2
6	4-7	12-16	4-7	12-16	12-16	10.6
7	4-7	2-4	4-7	12-16	7-12	7.5
8	4-7	4-7	4-7	12-16	7-12	8
Average	8.69	9.94	7	12.31	9	9.4

Note. The Play Age was determined based off the average of the Emphasis, Materials, Action, People, and Setting scores.

Figure 1 Desired Social Behaviors

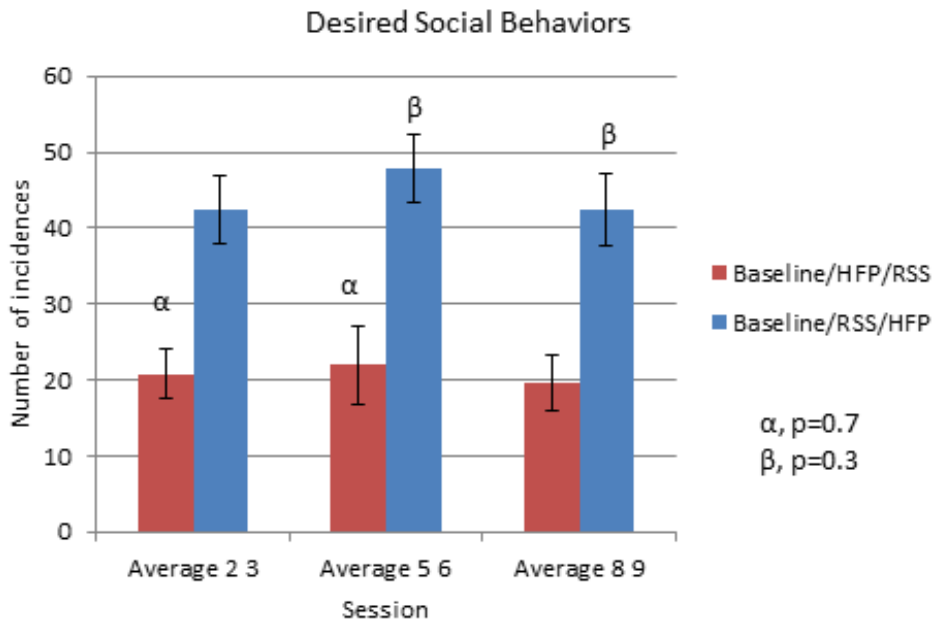


Figure 1. Scores were determined by the averages of the second and third sessions held in each condition: Baseline (Average 2 3); HFP alone and RSS alone (Average 5 6); and HFP with RSS and RSS with HFP (Average 8 9). HFP = High Functioning Playmates, RSS = Reduced Sensory Stimulation

Figure 2 Undesired Social Behaviors

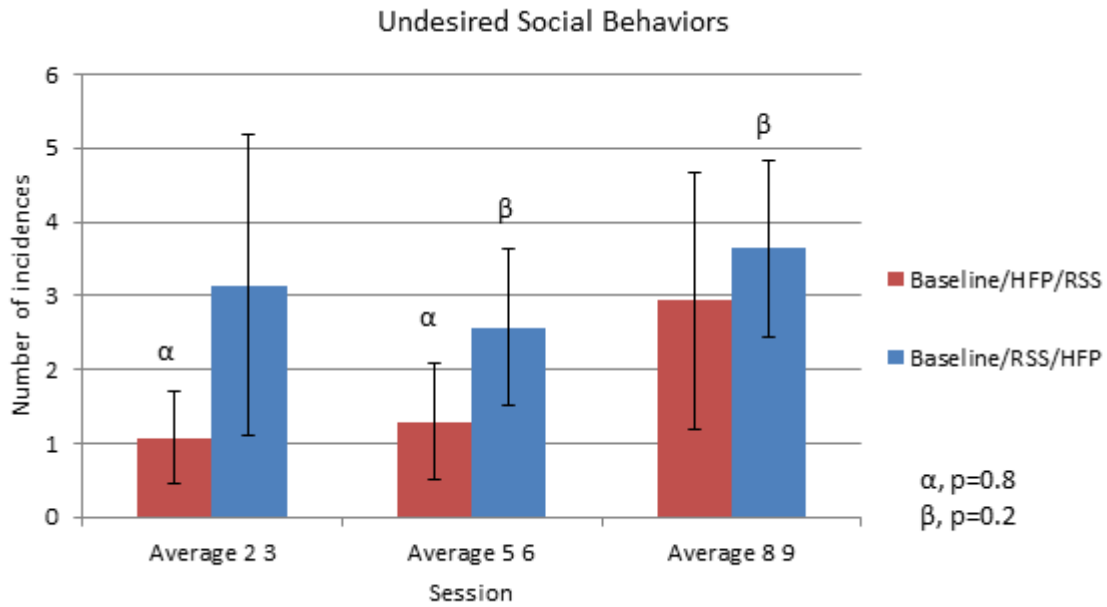


Figure 2. Scores were determined by the averages of the second and third sessions held in each condition: Baseline (Average 2 3); HFP alone and RSS alone (Average 5 6); and HFP with RSS and RSS with HFP(Average 8 9). HFP = High Functioning Playmates, RSS = Reduced Sensory Stimulation