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Joint Attention in the Child with Autism: An Appropriate Play Intervention for Children with Autism Spectrum Disorder

Taylor P. Basso
Claremont McKenna College

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CLAREMONT McKENNA COLLEGE

**JOINT ATTENTION IN THE CHILD WITH AUTISM:
AN APPROPRIATE PLAY INTERVENTION FOR CHILDREN WITH AUTISM
SPECTRUM DISORDER**

SUBMITTED TO

PROFESSOR MARJORIE CHARLOP

AND

DEAN NICHOLAS WARNER

BY

TAYLOR P. BASSO

FOR

SENIOR THESIS

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Abstract

The effects of an Appropriate Play Intervention program, given to three children diagnosed with Autism Spectrum Disorder, were evaluated through a multiple-baseline design across subjects. The research targeted two main skills, appropriate play and joint attention engagement, through the use of an Appropriate Play Intervention program. Children were taught the appropriate use of toys in play behavior with another individual, and measurements collected pre- and post-treatment were used to assess their progress. Upon introduction to the intervention, children showed a rapid increase in their acquisition of appropriate play skills and joint attention engagements, revealing a new perspective from which researchers can approach the deficiencies of joint attention skills in children with low-functioning Autism Spectrum Disorder.

Joint Attention in the Child with Autism:
An Appropriate Play Intervention for Children with
Autism Spectrum Disorder

It may seem as though the sole purpose of play is for the entertainment and enjoyment of children, however recent research has revealed that many integral aspects of early childhood development are acquired through play (Boutot, Guenther & Crozier, 2005). These gains include, but are not limited to, social and language skills, appropriate behavior, problem solving, and an array of other important cognitive skills (Bredenkamp & Copple, 1997; Gitlin-Weiner, Sandgrund & Schaefer, 2000; Saracho & Spodek, 1998). However, children dealing with Autism Spectrum Disorder (A.S.D.) have typically shown deficits in the development of critical play skills, and as a result are limited or lacking in the ancillary gains associated with appropriate play skills (Scheurmann & Webber, 2002). In fact, a lack of pretend and imaginative play is considered one of the defining characteristics of A.S.D. (American Psychiatric Association, 1994). Another area of development which is consistently seen as a key deficit in children with Autism Spectrum Disorder is underdeveloped joint attention skills, a deficiency which has been shown to lead to poor theory of mind, communication, and self-regulation skills (Mundy et al, 1986; Baron-Cohen, 1993; Tomasello & Farrar, 1986; Adamson & Russell, 1999). In attempt to combat these deficiencies, and improve joint attention and appropriate play in children with Autism Spectrum Disorder, recent research has placed an emphasis on a number of intervention programs to aid in the development of these skills. Some of these interventions have explored the benefits of play interventions, joint attention interventions, and the effects of both play and joint attention interventions together on the deficient elements of development for children with Autism Spectrum Disorder.

Research on Play

Researchers have measured play in various forms in regards to facilitating the development of these critical skills in children with A.S.D. One study looked at teaching play skills, measuring whether an intervention can effectively teach children with A.S.D. how to play. Results of this study revealed that the lack of typically developing play skills found in children with A.S.D. sets them apart from their peers. This element prevents them from experiencing the ancillary gains of play, including improvements in a variety of language, social, cognitive, and motor skills (Boutot, Guenther & Crozier, 2005). Essentially, this study confirmed that there is a lack of appropriate play skills in children with A.S.D., but showed that these play skills can be effectively taught to children with A.S.D. given the right intervention program. Moving forward from this research, it's important to explore whether improving their play skills actually has positive effects on the development of language, motor, social, and cognitive skills in the children with Autism Spectrum Disorder.

When dealing with interventions for children, it is important to consider the various locations and environments in which children learn. One study revealed that parents have the power to improve their children's level of joint engagement if they focus on adjusting three aspects of play: 1) Offering less commands and suggestions in play activities, allowing the child to lead play sessions, thus increasing their interest in the activity, 2) Playing at, or just above their child's mastered level of play, and 3) Imitating the child's actions during play as opposed to simply responding to them (Freeman & Kasari, 2013). According to the data, these adjustments in parent-child play behavior yielded positive results for both joint engagement frequency and duration, a skill which has previously been linked to the improvement of language and social skills in children with A.S.D. (Kasari et al., 2010). This study is especially relevant in that it

shows how children with A.S.D. can be taught how to play appropriately, hinting at an important connection between improving play skills and increasing joint engagement in children on the Autism spectrum.

Although in-home interventions and parent training serve a significant purpose in the development of the child's language and social skills, a large portion of a child's day is spent out of the home and in the classroom. Additional research has found that in-class, teacher-implemented intervention programs yield a significant increase in joint attention and symbolic play skills within the classroom. Compared to children with other developmental delays, children with A.S.D. spent more time unengaged in the classroom, and less time engaging in symbolic play and joint attention behaviors. Results also indicated that teachers of children with A.S.D. rarely focused on directly teaching symbolic play and joint attention skills within their classroom, and that implementing symbolic play and joint attention interventions in the classroom significantly improved the level of joint engagement in children with A.S.D. (Wong & Kasari, 2012; Wong, 2013) Results from these studies emphasize a need for teacher-implemented interventions in the classroom targeting joint attention and symbolic play skills in the curriculum for young children with A.S.D., and the importance of educating teachers on the benefits associated with teaching appropriate play skills to children with Autism Spectrum Disorder.

A 2010 study conducted by Kasari et al. also had significant results indicating that the limited and unusual play skills and person-object engagement in children with A.S.D. holds them back from fully developing appropriate play skills. As a result, she emphasized the importance of increasing joint engagement skills in children with A.S.D. in order to further aid the development of their language and social skills (Adamson et al. '04; Kasari et al. '08). Additionally, Kasari

noticed an important link between limited play skills and poor joint attention engagement. So by increasing the children's ability to engage in joint attention, she was able to demonstrate improvements in their level of appropriate play. However, it would be interesting to look at whether similar effects are seen in an inverse situation. If perhaps an intervention targeting appropriate play skills, as opposed to a joint attention intervention, would have any success in improving joint attention skills as well as social and communication skills in children with A.S.D.

Joint Attention Interventions

Joint attention has received a great deal of attention in recent research due to the benefits it has shown to have on the establishment of children's theory of mind, communication skills, and the ability to self-regulate emotions, among other things (Baron-Cohen, 1993; Tomasello & Farrar, 1986; Adamson & Russell, 1999). It is considered a critical social communication skill which emerges in neurotypical children during early childhood (Mundy et al., 2003), but has shown to be a core deficit in children with A.S.D. (Mundy et al. 1986). Joint attention deficiencies in children with A.S.D. have been previously linked to serious impairments in various aspects of emotional regulation and communication skills (Bredekamp & Copple, 1997; Adamson & Russell, 1999), creating a need for joint attention intervention programs to encourage the development of this seriously lacking skill and to bridge the gap between children on the Autism spectrum and their typically developing peers.

One specific joint attention intervention program which yielded compelling results was the Joint Attention Mediated Learning Program, or JAML (Schertz et al., 2011). This intervention program aimed to encourage the engagement of "learning how to learn" social cues and communication skills through the use of turn taking and encouraging the acknowledgement

of others shared interests. Results of this study indicated a positive effect for the JAML, using parents as the interventionists to encourage the development of preverbal social skills and communication. The success of the JAML program in eliciting improvements in social cues and communication skills could lie in its incorporation of the child's natural environment in a way which reinforces its generalizability, and in the way it encourages conceptual learning as opposed to structured learning through simple, everyday experiences. The study focuses on the importance of the early detection of A.S.D. in young children, so that early intervention can begin taking effect as early as possible. This concept of earlier detection, however, brings to light a critical need to develop age-appropriate, effective intervention programs for children of all ages on the Autism spectrum.

Results from recent studies have uncovered several interesting concepts regarding joint attention intervention. One such study looked at the benefit of using the older, typically developing siblings of children with A.S.D. as the interventionists in order to target complex social skills. It is believed that the use of a more natural, and generalizable environment and interventionist increased the children's motivation to learn and their ability to apply that knowledge to their daily lives (Ferraioli & Harris, 2011). Other research has shown links between complex or simple music patterns and improved joint attention engagement in children with A.S.D. (Kalas, 2012). This research found that complex music patterns were more effective in improving joint attention for children with mild A.S.D., while simple music patterns were more effective for children with severe A.S.D. in eliciting responses to joint attention bids. And finally, adults imitating preschoolers with A.S.D. elicited joint attention behaviors in the children, highlighting the potential benefit of imitation in play as a potential tool for intervention in children with Autism Spectrum Disorder (Ezell et al., 2012).

Play and Joint Attention Interventions

While the effects of play and joint attention have been studied separately, looking at their effects on developing social and communication skills, the present study is especially interested in studies that have compared these two skills side by side. One such study considered the benefits of improving joint attention and play skills, showing how both are significantly associated with gains in language outcomes (Kasari et al., 2012). Results indicated that focusing on these early developmental skills can be used as a tool for improving language outcomes in children with A.S.D. This is further enforced through the follow-up study, which revealed the long-standing treatment effects of this particular intervention (Kasari, Freeman & Paparella, 2006). Results demonstrated the long-term effectiveness of an intervention focused on early core deficits in Autism, emphasizing a need for early intervention programs that incorporate these targets into their curriculum in order to have a long-term and meaningful effect on the improved language outcomes.

Recent research on the subject has shown an interest in uncovering the reason why imitation skills, play skills, and joint attention skills are important areas of development to focus interventions towards for children with A.S.D., and to what extent these skills serve as early predictors of later intellectual functioning of the children. Results of this research show that the development of early language and social communicative behaviors plays a pivotal role in the later development of communication and intellectual functioning in children, revealing a need for intervention as early as possible for children with A.S.D. in order to prevent them from falling even further behind from their peers (Poon et al., 2011). This knowledge leaves room for further research to expand and determine what exactly the most efficient and effective

intervention programs would be in terms of improving language and social communication development through joint attention.

Lastly, Lawton and Kasari, (2012) studied the longitudinal improvements of joint attention skills in preschoolers with A.S.D., looking at three different groups of children; Children with A.S.D. exposed to a Joint Attention Intervention program, children with A.S.D. exposed to a Play Intervention program, and children with A.S.D. assigned to a no treatment group. Results for this study are worth noting as they show that both in the short and long run, joint attention quality and quantity improved for both the joint attention and symbolic play intervention groups, while the control group remained constant. This reaffirms the idea that intervention focused on improving play skills can improve a child's level of joint attention engagement as effectively as an intervention targeting joint attention specifically. With this in mind, it is important to begin considering the benefits children on the Autism spectrum could experience simply by being taught how appropriate play.

The Present Study

The goal of this type of research is to find the most effective and efficient method of intervention for improving language and communication skills in children with Autism Spectrum Disorder. Because increasing joint attention skills in children with A.S.D. has been linked to improvements in their language and social communication skills (Tomasello & Farrar, 1986), it is a popular area of focus for researchers in the field. Based on data from previous research, it seems clear that appropriate play interventions are the next step in research for improving social and communication skills in children with A.S.D. As mentioned previously, the study by Boutot, Guenther & Crozier (2005) confirmed that a lack of play skills in children with A.S.D. prevents

them from developing a variety of language, social, cognitive, and motor skills, and that you can effectively teach play skills to children with A.S.D. So from here, it is important to further explore potential interventions targeting joint attention engagement through the teaching of appropriate play skills to children with A.S.D.

The theory behind the present study is essentially that, if both joint attention and play have been shown to similarly improve the development of social and language skills in children with A.S.D. (Lawton & Kasari, 2012), it should theoretically be easier and therefore more effective to teach young children play skills than it would be to teach them joint attention skills. This theory is based on the idea that children learn information far more successfully when they are motivated to learn (Koegel, Koegel, & Smith, 1997), and play would be considered a more intrinsically motivating factor to children than joint attention intervention programs.

The purpose of this study was to examine the effects of an Appropriate Play Intervention program on the number of joint attention engagements in children with A.S.D. during a recorded play period. This study had two aims. First, we were interested in whether our Appropriate Play Intervention would improve children with Autism Spectrum disorders level of appropriate play with another individual. Second, we were curious as to whether improvements in joint attention would be seen in conjunction with improved appropriate play skills. We hypothesized that, upon exposure to the Appropriate Play Intervention, children would show an increase in their appropriate play skills. Additionally, it was hypothesized that as appropriate play skills were improved, children's number of joint attention engagements would increase when compared to their scores collected during baseline. The following pages address these research questions in detail.

Method

Participants

Participants were three boys attending weekly after-school behavioral therapy programs through the Claremont Autism Center. All three children received individual diagnoses of low-functioning Autism Spectrum Disorder from two separate specialists according to the *Diagnostic and Statistical Manual of Mental Disorders IV-TR* criteria (American Psychiatric Association, 2013), attended elementary school or participated in a specialized education program, and demonstrated limited verbal communication skills and joint attention engagements. The three children ranged in age from 6.8 to 7.6 years old with a mean age of 7.1 years when the study was initiated. They were recruited to participate in the present study based on their diagnosis of Autism Spectrum Disorder, their level of functioning, and their deficits in joint attention engagements and appropriate play skills.

At the start of the study, the youngest participant, Kevin, was 6.8 years old, followed by Jordan, who was 6.9 years, and finally the oldest boy was Brandon who was 7.7 years old at the start of the study.

Setting

The baseline assessments, intervention treatment programs, and post-treatment probe sessions were administered to the children in a work room (2.9 x 2.9 m) at the location of their after-school program. The generalization probes were conducted by a therapist other than the interventionist in room different from the baseline and treatment room, also within the clinic (2.5 x 4 m). Both rooms contained one small table and three chairs, a video recording station, a lap board, a motivating reward for the child to receive in the event of correct responses, and the predetermined box of toys used only for the purpose of the present study. Two of the chairs sat

facing one another, one for the research and the other for the participant. The third chair was positioned behind the research, in the direction of the participant, for the person recording the session to sit and capture the direction of gaze of the participant.

Materials

A group of predetermined toys, chosen based on predicted motivating factors for each of the children, were selected and used throughout the duration of the study. These twenty toys were kept away from the children at all times with the exception of intervention and probe phases in order to prevent bias and ensure that each child was equally exposed to the materials relating to the study.

An operationalized definition of the term ‘joint attention’ was created in order to accurately measure and quantify the frequency of joint attention engagements during each of the probe and treatment sessions. For the purpose of the study, joint attention was defined specifically as the occasion in which the child engages in eye contact with the researcher, gazes at the object of interest, and regains eye contact with researcher within a reasonable window of time. This time frame generally allowed for ten seconds of gazing at the toy before returning their gaze to the researcher. However, the researcher used practical discretion to determine whether joint attention was achieved during longer periods of time, or whether the second gaze during a longer window of time was coincidental. Originally, the operationalized definition of joint attention included a second element, which referred to a child gazing at the object of interest, making eye contact with the researcher, and returning their gaze to the object. However, after recording and rewatching the first baseline session with the first participant, it became clear that this would not provide an accurate measure of the child’s joint attention skills. It was too easy for the child to look from the toy to the researcher and back without actually being engaged

in both the toy and the researcher. For this reason, the second element of the definition of joint attention was dropped from the study for the purpose of coding the children's responses. During the coding of these probe sessions, such events were coded for how frequently the child engaged in joint attention behavior with the researcher out of a given eight opportunities.

Finally, for the purpose of coding the child's level of appropriate play, an operationalized definition of the term 'appropriate play' was created. The term was defined by an event in which the child either a) appropriately imitates the appropriate play skill modeled with toys by the interventionist, or b) uses the toys to perform actions different from those modeled to them by the interventionist, but still considered an appropriate use for the object. For example, if a child is shown to roll a ball, they may roll the ball or bounce the ball and still receive credit for appropriate play, but if they attempt to put the ball in their mouth it is not counted towards their appropriate play score.

Design and Procedure

A multiple baseline design across participants was used to assess the effects of the Appropriate Play Intervention on the target skills. This design has been validated as a beneficial experimental design used in the research of children with developmental disorders (Nock, 2002). All sessions were conducted independently for each participant. During baseline, participants were given eight opportunities to engage in joint attention with the interventionist and to display appropriate play through the use of toys provided. Following baseline, the Appropriate Play Intervention was introduced to each child on a weekly basis, with intervention start times for each participant varying between children as determined by random assignment, so as to meet the requirements of the multiple baseline design used in the study. After each weekly Appropriate Play Intervention, children were observed during a five to ten minute play probe

session with another individual to measure the target skills of appropriate play and joint attention engagement. Children also participated in generalization probes in a different location with a new interventionist randomly throughout baseline and once upon completion of the study to measure the treatments generalizability across interventionists and location. These sessions were later coded for the number of appropriate play behaviors displayed out of a possible eight opportunities, and for the number of joint attention engagements out of a possible eight opportunities.

Baseline. During baseline, each child's level of joint attention engagement and appropriate play levels were assessed during five to ten minute recorded play probe sessions. These play probes were structured so that the interventionist introduced eight different toys from the box of twenty possible toys, one at a time. When introducing each toy, the interventionist appropriately played with each toy twice before giving the child the opportunity to play with the toy. If, at any point during these eight interactions, the child was to engage in joint attention with the interventionist, they were provided with a motivating reward, such as a favorite snack or juice, and received praise which sounded like "That was good looking, Kevin. You looked at me, at the toy, and back at me. Good job!" If the child failed to engage in joint attention for a toy, the researcher would suggest a new toy, put the first away and do the same for the next toy until they used a total of eight toys. During these sessions, the child is not prompted to engage in joint attention, but is placed in an environment where he is given the opportunity to do so, and reinforced if the behavior does occur.

Treatment. Following baseline, the Appropriate Play Intervention was introduced during ten minute weekly recorded sessions. During the intervention phase, the researcher would model appropriate play to the child using eight randomly selected toys from the predetermined toy box.

The treatment session was structured to serve as relatively close model of a typical dyad play period, using phrases such as “Your turn” and “My turn” to establish the treatment session as a paired play session as opposed to an individual play session. The researcher would first introduce the toy, holding it still on the lap board giving the child the opportunity to engage in joint attention. The researcher would then model appropriate play with the toy, repeating the action three times, before repeating the process. The child was then given the opportunity to practice the modeled skills, prompted by the researcher saying things such as “Do this with the toy” or “Can you make the dinosaur stomp?” If, at any point during this interaction, the child engages in joint attention with the researcher, they are immediately provided with reinforcement in the form of a motivating snack and verbal praise, and allowed thirty or so additional seconds to play with the toy. Should they fail to engage in joint attention within a reasonable period (typically lasting around one minute), the researcher would move on to the next toy.

Each fifteen minute intervention phase was followed shortly after by a five to ten minute recorded play probe session identical to the ones used during baseline. These sessions were later coded for joint attention engagement frequency and their level of appropriate play following treatment. A criterion for completion of the study was set at 87.5%, or seven correct joint attention responses out of eight opportunities. A child was considered to have mastered the target skills of the study when he had reached the criterion of 87.5% or higher on joint attention engagements during two consecutive post-treatment probes, and at that point had concluded his participation in the study.

Generalization Probes. In order to measure the generalizability of the skills acquired throughout the duration of the study, generalization probes were collected and coded. These probes were structure exactly like the baseline and play probes, but were conducted in a new

room and by a different interventionist. Generalization probes were collected randomly throughout the baseline sessions and again once the child had met criterion to show that improvements could be generalized to other locations and interventionists.

Data Collection and Inter-rater Reliability

Upon completion of the study, two blind, trained raters were asked to code one third of all the sessions, including baseline probes, generalization probes, play probe sessions, and the intervention phase. Raters were first trained to code the videos by learning the definitions of appropriate play and joint attention, and were given instruction on how to properly use the coding sheet during the coding process (Appendix A). The researcher then watched a video, not of the 33% indicated for the raters to code, and gave examples of how to determine joint attention from other forms of gazing, specifying what types of play were considered appropriate and what actions were not. They were given a coding sheet which included the operationalized definitions of joint attention and appropriate play as a reminder. There were also two sets of eight lines on the page, one titled joint attention engagements and the other appropriate play responses. Check marks were used to record on the corresponding line and in the appropriate set of lines if the child engaged in joint attention behavior or demonstrated appropriate play with the object of interest. X's were used to record if the child failed to engage in joint attention with a toy, or failed to play appropriate with that toy. Raters then recorded how many total correct responses the children had out of a possible eight opportunities. After they had each completed coding the assigned videos, they were checked for internal consistency showing similar scores for each session within relative consistency. There were no instances of disagreement by more than one mark, and differences were settled by re-watching the video of interest, and discussing

their conclusions. Inter-observer reliability averaged across all three children at 97% for joint attention engagements, and 87% for appropriate play responses.

Results

Figure 1 shows a significant increase in the children's level of appropriate play between baseline probes and treatment session probes. In addition, Figure 1 shows a relatively consistent pattern of appropriate play levels before introduction to the treatment phase, and a relatively smooth increase in appropriate play level upon further exposure to the treatment. When compared alongside Figure 2, it can be seen that overall, participants level of appropriate play was higher than their level of joint attention engagements. It can also be observed that as levels of appropriate play increase upon exposure to the treatment, joint attention engagements shortly follow. This hints towards the idea that as the level of appropriate play is increased in the children, their amount of joint attention engagements can also be expected to improve. Similarly to Figure 1, Figure 2 shows rather consistent baseline scores for each child, and a relatively smooth increase in joint attention engagements following introduction to the treatment phase, with the exception of one child who was somewhat less consistent. In both figures, generalization probes can also be seen at consistent levels throughout the data, appropriately reflecting data from probe and treatment periods. For all three children in both figures, scores tended to be higher during the probe sessions than during treatment sessions.

Kevin was exposed to four baseline sessions and one generalization probe before being exposed to the Appropriate Play Intervention phase. During these sessions, he varied consistently between three to four appropriate play responses out of a possible eight, and one to two joint attention engagements out of a possible eight. Kevin was exposed to seven treatment phases in total before reaching criterion at two consecutive probes with scores of seven out of eight and

eight out of eight joint attention engagements respectively. Upon introduction the Appropriate Play Intervention phase, Kevin's levels rose steadily from five out of eight appropriate play responses to eight out of eight correct responses by the fifth treatment session. His joint attention engagements, however, were somewhat less consistent. In his first two exposures to the treatment session, Kevin's scores for joint attention engagements rose to five and six out of eight opportunities respectively. Following that, however, he dipped down to two consecutive sessions scoring four out of eight on joint attention engagements, which were consistent with his overall lack of focus throughout those entire days at the after school program. In following visits, he showed dramatic improvements in his level of joint attention engagements, scoring in the seven and eight out of eight range for the remainder of his sessions. Each of Kevin's generalization probes were consistent with the levels he had shown during baseline, treatment, and assessment probes.

Jordan's initial levels of joint attention and appropriate play were assessed during six baseline sessions and one generalization probe. His levels for both measures fluctuated between two and four out of eight opportunities during baseline, with consistent generalization probes. Jordan had the shortest treatment phase of the three participants, as he was able to meet criterion in only two exposures to the treatment phase. Upon exposure to the treatment phase, Jordan's level of appropriate play rose from four out of eight correct responses during baseline, to seven and eight out of eight respectively during the treatment phase and following probes, with a consistent generalization probe. Similar results were seen in his joint attention engagements, jumping from a high of four out of eight during baseline to a seven and eight out of eight joint attention engagements in the probes collected following each treatment session, with a consistent generalization probe.

Finally, Brandon was exposed to eight baseline probes and two generalization probes before being introduced to the treatment phase. In baseline, Brandon's level of appropriate play varied consistently between zero and two appropriate play responses, with the exception of the eighth probe, in which he spiked to five correct responses out of a possible eight. During baseline, his level of joint attention engagements were consistently scored between one and two correct responses, with consistent generalization probes. Brandon was exposed to six treatment sessions and assessment probes before reaching criterion. Upon introduction to the treatment phase, Brandon showed increases in both his level of appropriate play and in his number of joint attention engagements. With the exception of one minor deviation seen during the fourth treatment session, Brandon's level appropriate play improved from six to eight out of eight correct responses after receiving the Appropriate Play Intervention. His level of joint attention engagements improved more steadily, jumping from a high of one out of eight correct responses during baseline, to four out of eight responses after the first treatment session, and rising as high as eight and seven out of eight joint attention engagements respectively by the end of the treatment period. His generalization probe post-treatment was consistent with scores from his treatment and assessment probes.

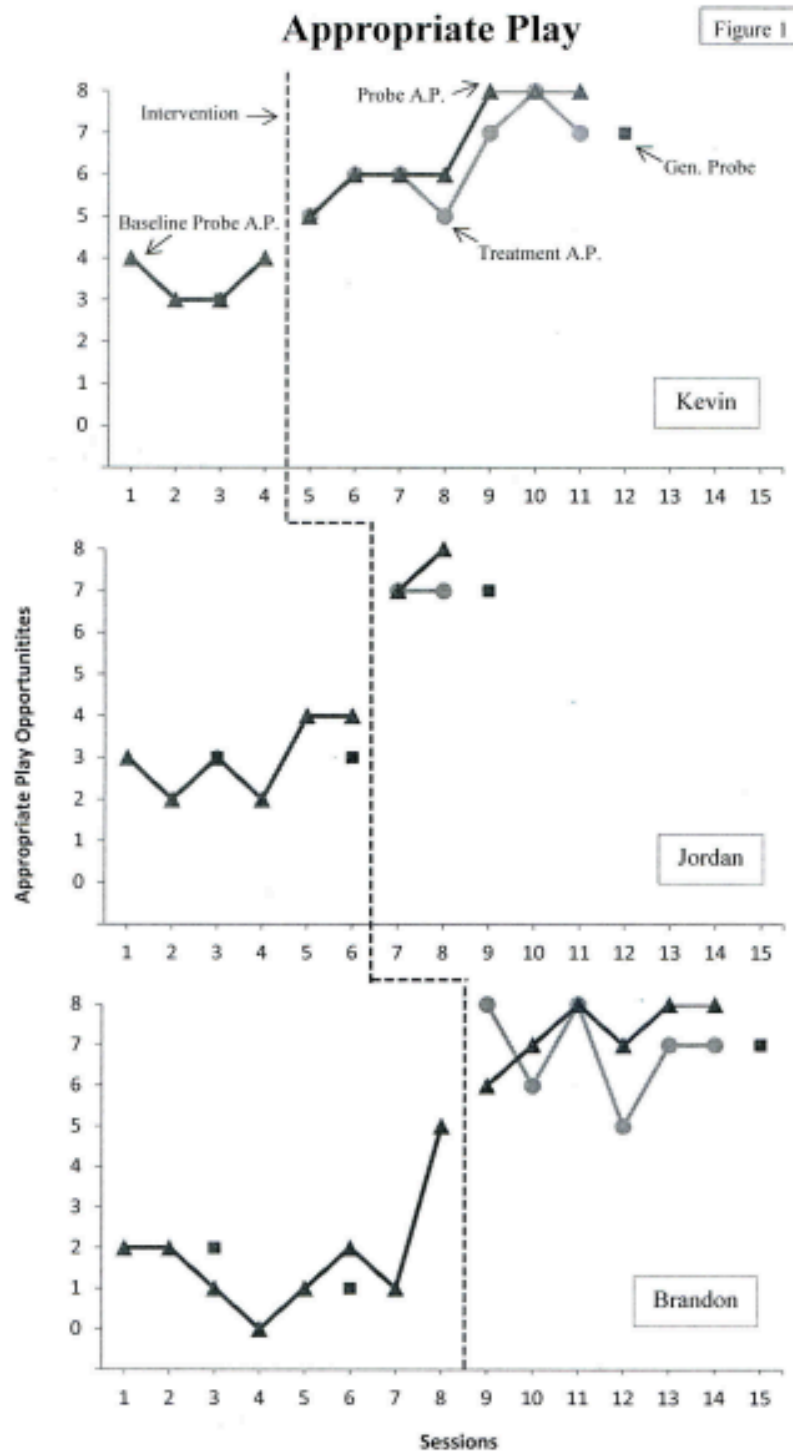


Figure 1. Multiple-Baseline Across Participants Analysis for Level of Appropriate Play

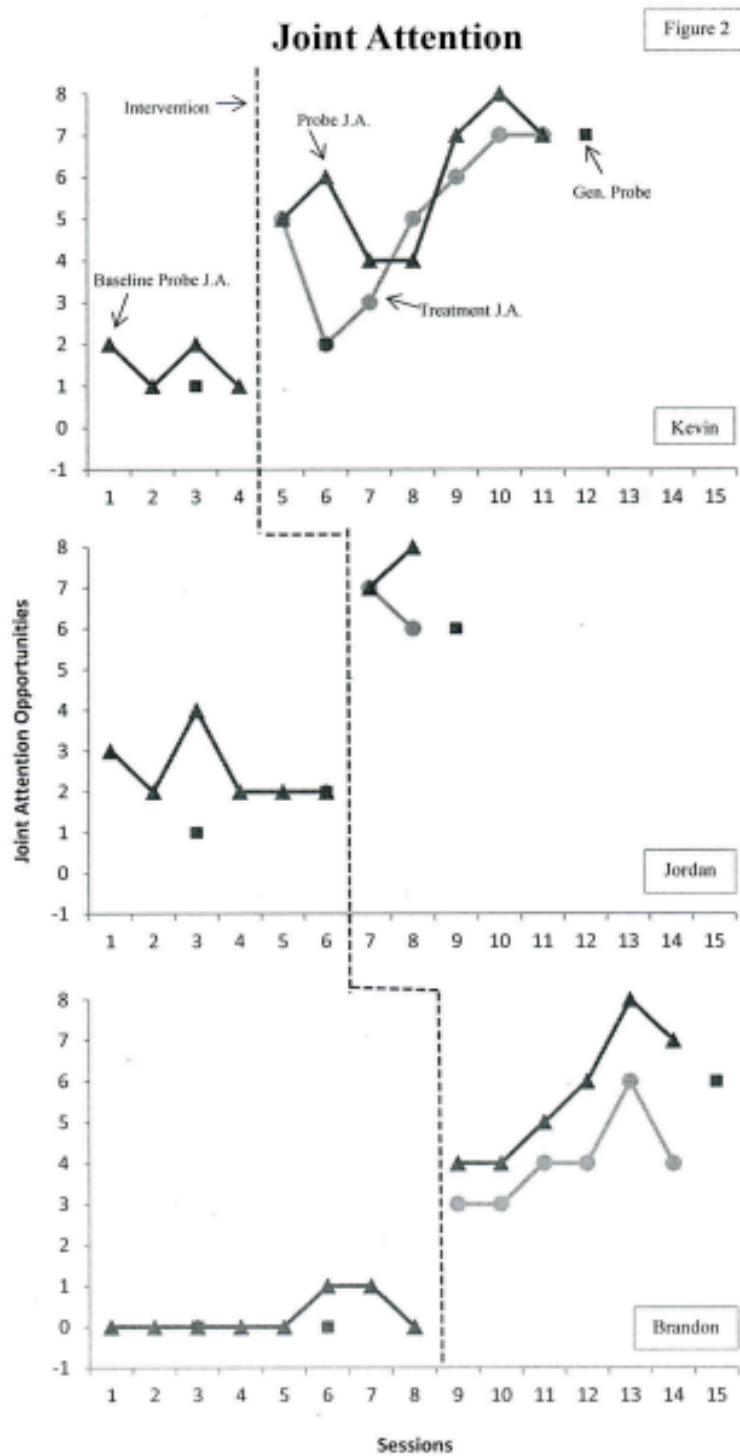


Figure 2. Multiple-Baseline Across Participants Analysis for Number of Joint Attention Engagements

Discussion

The purpose of the present study was to test an alternative method of improving joint attention in children with low-functioning Autism Spectrum Disorder through the use of an Appropriate Play Intervention program. In the past, joint attention deficits have been targeted directly through a joint attention intervention program, teaching the fundamental skills of joint attention in order to improve children's level of appropriate play (Ezell et al., 2012; Ferraioli & Harris, 2011; Kalas, 2012; Schertz et al., 2011). The present study hypothesized that exposure to an Appropriate Play Intervention program would improve the ability of children with low-functioning Autism Spectrum Disorder to engage in appropriate play behaviors, and in the process would improve their level of joint attention engagements in a dyad play setting. Results from this study support the proposed hypotheses, emphasizing the benefits that an Appropriate Play Intervention can have on improving joint attention skills in children with low-functioning Autism Spectrum Disorder.

It was first hypothesized that exposure to the Appropriate Play Intervention program would increase the target behavior of appropriate play in post-treatment probes when compared to scores collected during baseline. The data supports the hypothesis that appropriate play will increase through the introduction to an Appropriate Play Intervention, which aligns with previous research whose findings suggested the effectiveness of teaching appropriate play to children with Autism Spectrum Disorder (Boutot, Guenther & Crozier, 2005). While this finding is not uncovering any unknown truths about appropriate play in children with A.S.D., it is

important in considering implications this might have in relation to our second hypothesis, and is therefore of vital importance to the findings of the present study.

The second hypothesis of the present study was that there would be a direct positive correlation between appropriate play levels increasing during the treatment phase and the number of joint attention engagements seen in the children post-treatment. Data from this study strongly supports this hypothesis, showing an increase in both the children's level of appropriate play and their number of joint attention engagements in probes collected post-treatment throughout the duration of the study. This finding is of critical importance in that it suggests the possibility of improving a child with low-functioning Autism Spectrum Disorder's ability to engage in joint attention behaviors with another individual simply by teaching them basic fundamental skills required to engage in appropriate play with another person.

While previous research has encouraged the use of joint attention interventions to improve children's joint attention skills, and as a result improve their long term language and communication outcomes, the present study aims to take a different stance on the matter (Ezell et al., 2012; Ferraioli & Harris, 2011; Kalas, 2012; Schertz et al., 2011; Baron-Cohen, 1993). The hypotheses of the present study were based on the idea that children are more likely to learn material which is intrinsically motivating to them, referring to behaviors that appear to have no relation to the gain of an immediate extrinsic goal, such as acquiring food (Mirolli & Baldassarre, 2013). It was predicted that information taught in a play intervention would be more intrinsically motivating for a child to learn than the content of a joint attention intervention might be. Additionally, because the structure of the Appropriate Play Intervention involved learning to play appropriately with another individual, the ability to engage in joint attention behavior seemed to be an obvious ancillary gain of the intervention because one cannot play appropriately

with another person without engaging in eye contact in the process. Results from this research emphasize the idea that, while joint attention interventions are effective in improving the level of joint attention in children with low-functioning Autism Spectrum Disorder, an Appropriate Play Intervention might be a more effective method. This is due to the intrinsically motivating factors of play, which appeal more to the interests of young children, and should therefore be easier for an interventionist to teach while still seeing the outcomes in joint attention improvements.

Strengths and Limitations

There are several limitations to this study which are important to note. First of which includes the number of children who participated in the study. Because of the strict requirements of having low joint attention skills, limited appropriate play skills, and being on the low-functioning end of the Autism Spectrum, and also because of the limited pool of children we had to recruit from at the Claremont Autism Center, only three children met our requirements and were therefore eligible to participate in the study. Because the structure of a multiple baseline design requires a minimum of three participants, this study was right at the cusp of eligibility to use the design, and although the results are still generalizable to other children with low-functioning Autism Spectrum Disorder, it would have been beneficial to have a larger pool of data to compare and draw conclusions from.

Additionally, due to the nature of the coding process, the study was required to use a slightly modified definition of joint attention to ensure the legitimacy of each child's joint attention scores. Typically joint attention can be defined as either 1) the child making eye contact with another individual, gazing at the object of interest, and regaining eye contact with the individual, or 2) the child gazing at the object of interest, making eye contact with the individual,

and returning their gaze to the object (Farroni et al., 2007; Hood et al., 1998). However, for the purpose of this study, the latter element of the definition was omitted to ensure the intentionality of engagements in joint attention behavior. With this in mind, it is possible that there were more joint attention engagements occurring than were actually able to be coded, possibly weakening the results of the study. However, we found this to be a necessary action to be taken in order to maintain the strongest possible accuracy of the data collected.

Because of overlap with other research some of the children were participating in at the time, there was also a limitation placed on the range of toys and play behaviors available to include in the treatment and probe sessions. As a result, we were unable to teach all of the appropriate play skills we would have liked, and were restricted to a smaller variation of toys than we would have preferred. While this may or may not have weakened the results of our study, it is likely that the children would have seen greater benefits from exposure to a wider range of toys and skills, both throughout the duration of the study and when applying their newly developed skills to their daily lives.

With this in mind, there are also several strengths of the present study that deserve recognition. First, this study takes a unique approach on the topic of joint attention in children with A.S.D., exploring possible solutions that may have otherwise been overlooked. The present study focuses the intervention on improving the fundamental skills of appropriate play in a dyad setting, teaching the child not only how to use toys appropriate, but also how to do so while engaging with another individual. Other interventions which directly target the deficiencies of joint attention in children with A.S.D. tend to overlook some of the more basic deficits the child faces, such as an inability to correctly use toys presented in a play setting, leaving them in a difficult place when it comes time to apply their newly acquired joint attention skills in a real-

world setting. The present study not only provides the child with the fundamental tools needed to successfully play and engage with another child, it also has shown how improving this skill leads to improved joint attention skills as an ancillary gain, preparing the child, not only to further develop their joint attention skills, but also to apply their skills directly to a typical play setting.

Another notable strength of this study is that it tailors its intervention program in a way that it most directly appeals to the interests of its target population. While other interventions targeting improvements in joint attention skills do so through tedious methodology that is not necessarily intrinsically motivating to young children, the Appropriate Play Intervention shows improvements in the target outcomes through the teaching of play, which is widely known as a highly motivating activity for children (Schertz et al., 2011). Because research shows that children are more quick to learn information that is presented to them in a way that is intrinsically motivating to them, it seems that the Appropriate Play Intervention would be the most logical choice for teaching joint attention to children with low-functioning Autism Spectrum Disorder.

The current study also gains strength through the way in which it pioneers an entirely new point of view from which researchers and interventionists can look at the roots of well-developed joint attention skills in children with A.S.D. It is able to shed light on an overlooked gap in the previous research, which has focused directly on improving the deficient social skills, while overlooking seemingly minor fundamental skills which are necessary for the effective application of improved joint attention skills as a whole. The present study does so by placing a greater emphasis on the importance of appropriate play, and as a result is able to highlight the improved outcomes in joint attention engagement for children with Autism Spectrum Disorder.

Overall, the present study is faced with its share of limitations that may have had an effect on the overall scores on joint attention and appropriate play outcomes of our participants. However, there are also many noteworthy strengths, which reinforce the significance of the results and emphasize the importance of the unique direction and focus of the research as a whole.

Future Research

The finding of the present study suggests that an Appropriate Play Intervention can be an effective method for improving joint attention outcomes in children with A.S.D. Because this is only a preliminary study, and one of the first to consider appropriate play as a possible precursor to joint attention development, there is a high need for additional research on the subject. First, it would be beneficial to compare results of children exposed to a Joint Attention Intervention and those exposed to an Appropriate Play Intervention in order to compare and measure the successes of the two programs, testing the theory that appropriate play is more easily and quickly taught to children with A.S.D., while yielding similar outcomes in terms of gains in joint attention engagements.

Additionally, a longitudinal study is needed in order to measure the long term benefits of the gains in joint attention achieved for children exposed to the Appropriate Play Intervention. This can be used to measure the extent to which the joint attention gains will lead to the same predicted language and communication outcomes that are seen in children who are exposed to the direct joint attention intervention (Baron-Cohen, 1993). While it can be assumed that the important elements of joint attention are rooted in the overall acquisition of the skill, and not in the way in which the skill is acquired, such a study is necessary if we are to be able to say with

certainty that joint attention skills gained through an Appropriate Play Intervention lead to the same outcomes as those of a traditional Joint Attention Intervention program.

In conclusion, the present study demonstrated the effectiveness of an Appropriate Play Intervention on improving joint attention skills in low-functioning children with Autism Spectrum Disorder. All three of the participants showed improvements in both their level of appropriate play, and their number of joint attention engagements upon exposure to the intervention when compared to their scores in baseline. The field of social skills research should continue to investigate the benefits of this non-traditional approach to improving joint attention skills., and allow these children to benefit from the untapped medium of joint attention acquisition through the teaching of appropriate play skills to low-functioning children suffering from the deficits of Autism Spectrum Disorder.

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Appendix A

Sample Coding Sheet Front

Coder _____

Baseline or Gen.Probe
(Circle One)

TAYLOR BASSO'S SENIOR THESIS
Assessment Coding Sheet

Joint Attention Definition: Joint Attention is achieved when the child engages in eye contact with the interventionist, glances at object of interest, and regains eye contact with the interventionist.

Appropriate Play Definition: An appropriate play behavior is characterized by the child accurately imitating the play behavior demonstrated by the interventionist, or if they use the toy in a way different from what is modeled, but in a way which is still considered an appropriate use of the object.

Name of Child _____

Date _____

Session 1 2 3 4 5 6 7 8 9 10 11 (Circle One)

Joint Attention Engagements:

Engages in Joint Attention	(or)	
Opportunity 1		
Opportunity 2		
Opportunity 3		
Opportunity 4		
Opportunity 5		
Opportunity 6		
Opportunity 7		
Opportunity 8		
Frequency Total:		%

Sample Coding Sheet Back

Coder _____

Appropriate Play: Duration & Frequency

Engages in Appropriate Play (or)	
Opportunity 1	
Opportunity 2	
Opportunity 3	
Opportunity 4	
Opportunity 5	
Opportunity 6	
Opportunity 7	
Opportunity 8	
	Frequency Total: %