

AUTISM, PLAY, AND LANGUAGE OUTPUT

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A Thesis submitted to the faculty of  
San Francisco State University  
In partial fulfillment of  
the requirements for  
the Degree

Master of Science

In

Communicative Disorders

by

Sylvia Elizabeth Soule

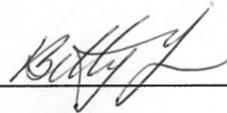
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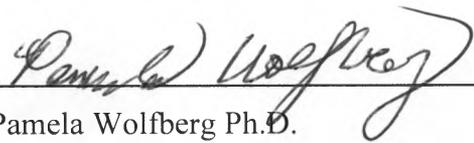
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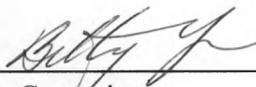
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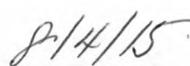
# AUTISM, PLAY, AND LANGUAGE OUTPUT

Sylvia Elizabeth Soule  
San Francisco, California  
2015

This thesis explores the role of play in the language development of children with autism spectrum disorders. Seven elementary-school aged children with autism spectrum disorders were observed in unsupported play sessions with unfamiliar typically developing children in which ball play, constructive play and sociodramatic play occurred, both before and after participation in an Integrated Play Groups intervention. Preliminary support was found for the hypothesis that children with autism produce higher rates of language output in the context of sociodramatic play when compared to the context of ball play. In some conditions, preliminary support was also found for children with autism producing higher rates of language output after having participated in an Integrated Play Groups intervention.

I certify that the Abstract is a correct representation of the content of this thesis.

  
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## INTRODUCTION

Speech-language pathologists are often looking for ways to help their clients who are diagnosed with autism spectrum disorders increase their verbal output. Part of the diagnostic criteria for autism spectrum disorder includes “persistent difficulties in the social use of verbal and nonverbal communication” (American Psychiatric Association, 2013). Children with autism often develop spoken language later than their typically developing peers (Charman, Drew, Baird, & Baird, 2003) and many continue to have relatively low levels of verbal output throughout development. Some research suggests that participating in play experiences might have connections to positive development, including development of language skills, in both typically developing children and children with autism.

This thesis explores aspects of the connection between autism, language, and play; specifically, the study looks at children with autism in play settings and analyzes whether the type of play activity that is occurring has an effect on the rate of utterances the child with autism produces. It also explores whether children with autism produce more frequent utterances during play after having participated in an Integrated Play Groups intervention (Wolfberg et al., 2015). Seven elementary-school aged children with autism spectrum disorders were observed in unsupported play sessions with unfamiliar typically developing children in which ball play, constructive play and sociodramatic play occurred, both before and after participation in an Integrated Play Groups intervention. Preliminary support was found for the hypothesis that children with autism produce higher rates of language output in the context of sociodramatic play when compared to the context of ball play. In some conditions,

preliminary support was also found for children with autism producing higher rates of language output after having participated in an Integrated Play Groups intervention.

## REVIEW OF THE LITERATURE

### What Is Play?

In order to understand the relationship between language and play in children, it's necessary to discuss what is meant by the word "play." Unfortunately, providing a meaning for this term is not as straightforward as one might think, as there is no clear agreement on the definition of play. Throughout the history of the study of child development, researchers have been challenged by the task of defining the nature of play and understanding its role in development. Just before the turn of the 20<sup>th</sup> century, William T. Preyer, one of the founders of child psychology, wrote, "A satisfactory theory of play is still wanting, and yet a man does not learn through any kind of instruction or study in later life anything like so much as the child learns in the first four years of his careless existence, through the perceptions and ideas acquired in his play" (Preyer, 1893: 42). Over one hundred years later, developmental psychologist Thomas Power wrote, "Given its elusive nature, it is unlikely that researchers will ever come up with a satisfactory definition of play" (Power, 1999: 391). Spanning more than a century, these two scholars commented on the inability of scientists to capture the nature and function of play in their research.

It's difficult to understand the purpose and importance of a behavior when simply defining the behavior itself is a challenge. Researchers have yet to come to a consensus about what counts as play and what does not. Possible definitions abound; Fagen's (1981) book *Animal Play Behavior* contains a five-page list of definitions of play. Bekoff & Byers (1981) gave a fairly broad definition of play that is now widely cited: "Play is all motor activity performed postnatally that appears to be purposeless, in which motor patterns from other contexts may often be used in modified forms and altered

temporal sequencing” (300). Bekoff (1984) continued: “If the activity is directed toward another living individual, it is called social play; if it is directed toward an inanimate object(s), it is called object play; if the activity carries the individual in a seemingly frantic flight about its environment, it is called locomotor play” (229). Put shortly, by this definition, play is any activity that doesn’t seem to have an immediate purpose. It’s no wonder then that researchers have had such difficulty in determining what its developmental purpose truly is.

An important component of play that shouldn’t be left out of any account is expressed by Spinka, Newberry, & Bekoff (2001): they state that play is “underlain by neuroendocrinological responses that produce a complex emotional state known as ‘having fun’” (142). Play seems to be pleasurable to those who engage in it. Individuals who are playing are usually intrinsically motivated, and play is relatively stress-free, with more attention paid to means over ends. Bruner (1972) suggests that since players are not concerned with the outcome or usefulness of their behaviors during play, they are free to be creative and experiment with aspects of their behavior. It’s argued that this type of play experience can lead to increased behavioral and cognitive flexibility, facilitating the individual’s ability to generate novel behaviors (Pellegrini, 2009) and respond in creative ways to the unexpected (Spinka et al., 2001).

For the purposes of this thesis, the definition of play in general will be left somewhat open. It is noted that important components of play are an emphasis on the process of the activity rather than any predetermined outcome, and that the actions of play are flexible, pleasurable, and intrinsically motivating. The specific types of play activities used in this experiment (ball play, constructive play and sociodramatic play) are defined in more detail in the methodology section.

## The Primacy of Play

### *Animal Play*

Animal research offers the clearest lens on the primal importance of play, which is necessary to establish in order to understand why we should consider play as an essential factor in development. Play is easier to study in animals than in humans, since we are better able to manipulate the play opportunities that laboratory animals are given during their development. There has been a fair amount of research conducted on animals to determine the importance of play. Play has been observed in virtually all animal species, from monkeys to horses to octopi (Burghardt, 2005). Social play has been the most often studied type of play, and it seems to be especially prevalent in species with higher levels of sociality in general (Byers, 1981) and in species with greater amounts of postnatal brain growth (Montgomery, 2014). Arguably the most effective way to determine the role of play in development has been to deprive individual animals of play experience and observe any differences in their later behavior. If animals that were deprived of play as juveniles later show decreased social skills, for example, this would indicate that play serves to facilitate the development of social skills. Indeed, observable effects of being deprived of social interaction, including play, have been recorded in several species. Following isolation at a young age, monkeys have shown inability to form social or sexual attachments to other monkeys (Harlow & Suomi, 1971; Suomi, Harlow, & Novak, 1974). Dogs that have been isolated for one week after weaning leave the play group, play alone more and show more passive avoidance behavior than dogs that were not isolated (Fox & Stelzner, 1966). However most of the deprivation research has been carried out on rats, and some of this research has been able to specifically target the variable of play deprivation, rather than just social contact in general.

Rats have a period in their development that is characterized by a considerable amount of time spent playing with other rats. Social play in the rat emerges at around 18 days of age, peaks during

weeks 4 and 5, and decreases until sexual maturity (Hol, Van den Berg, Van Ree, & Spruijt, 1999). Rats are considered to be social creatures that require interaction with other rats at critical periods in development in order to develop normally. Researchers have experimented with isolating rats from their peers during weeks 4 and 5 of their life, housing them alone and thus preventing them from engaging in play. The rats that have been isolated during this critical period show behavioral differences later in their development that appear to be permanent; the differences persist even after the isolated rats have been re-introduced into social housing with their peers.

Rats that have been isolated during the critical play period have been shown to display differences in several areas of development. Isolated rats demonstrate less social activity (Hol et al, 1999; Lukkes, Mokin, Scholl, & Forster, 2009) and are more fearful in social situations (Lukkes et al., 2009) when compared to rats who were not isolated. They are more hyperactive (Einson & Morgan, 1978) and have higher basal anxiety levels (Da Silva, Ferreira, De Padua Carobrez, & Morato, 1996). They show increased environmental neophobia, or fear of new environments, under some conditions (Hall, Humby, Wilkinson, & Robbins, 1997) and are slower to habituate (Morgan, 1973). Isolated rats show deficits in spatial memory (Einson, 1980), are slow to reverse a previously learned visual discriminations (Rosenzweig, 1971), and have difficulty inhibiting their responses or switching between different patterns of behavior (Morgan & Einson, 1975). There is also some evidence that isolation may impact mating behaviors (Gruendel & Arnold, 1969) and agonistic (fighting) behaviors (van den Berg et al., 1999).

In short, rats that were isolated during a critical period in their development show differences across several domains, in particular social development, reactions to the environment, and learning abilities. But is it the isolation from social contact in general that affects these rats, or is there something specific about play experience that is necessary for their typical development? Further

research suggests that it is the absence of play experiences in particular that is harmful to these isolated rats. A study by Einon, Morgan, & Kibbler (1978) experimented on three different groups of rats. One group was isolated from all contact with other rats between 25-45 days of age. These rats later showed deficits in their development like those discussed above; they demonstrated a higher level of arousal and were slower to learn. A second group of rats was isolated between 25-45 days of age – except for one hour per day, in which they were put in a cage with a typical, non-isolated rat, and allowed to play. Following the experiment, the isolated rat that had been allowed to play with a peer for one hour per day behaved no differently from a typical rat that had never been isolated. One hour a day of play with another rat during the fourth and fifth week of life was enough to completely reverse the effects of the isolation on the rats, even if they were subsequently completely isolated for 55 days following the fifth week of their development.

But how can we be sure that it was the play interaction and not merely the physical presence of another rat that had the attenuating effect on the isolation? This is demonstrated by the third group of rats in the study by Einon et al. (1978). The third group of rats was isolated except for one hour per day, when they were put in a cage with another rat – but this partner rat had been drugged. The playmate rats were given either amphetamine or chlorpromazine, which caused them to remain mostly still and to be unresponsive to bids for play. This third group of rats, who were only allowed contact with drugged rats who would not play, ended up developing exactly the same deficits as the rats that had been totally isolated for 24 hours a day. Simply being in a cage with another rat was not sufficient to attenuate the effects of the isolation – it was the play experience that the rats were sorely missing. The researchers observed that the isolated rats, when put in the cage with a drugged rat, would try for the entire hour to play with their unresponsive partners. (Non-isolated rats, on the other hand, when put in a cage with a drugged rat, would attempt to play for a portion of the hour, then curl up and go to sleep.)

This provides compelling evidence that for the rat, early play experience is a crucial factor in developing typical social skills, learning abilities, and reactions to the environment. This profile of permanent behavioral differences observed when comparing isolated, partially-isolated, and socially-raised animals seems to be specific to species of animals that engage in play as a natural part of their development. Einon et al (1981) observed the behavior of normal rats, gerbils, mice, and guinea pigs. The rats were the only ones to spend a significant portion of their time on play-fighting (about 17% of their time at 30 days of age). The mice and guinea pigs were not observed to chase and wrestle, and the gerbils spent less than 1% of their time chasing and wrestling. It was found that mice, gerbils and guinea pigs did show some behavioral differences after being raised in isolation – but these differences were not permanent, and after a period of social housing the animals would return to normal. In addition, being given an hour of daily social contact per day had no attenuating effect on the temporary behavioral differences of the isolated mice, gerbils or guinea pigs. The rat was the only rodent studied that experienced permanent effects from being raised in isolation, and only the rat showed a difference after being given one hour per day of social contact rather than being totally isolated. This suggests that play is necessary for the development of the rat, but not for certain other, less social types of rodent.

Humans and rats are, of course, different in myriad ways. However, humans are definitely more like rats than we are like the mice, gerbils or guinea pigs. Like rats, humans are social creatures who engage in high levels of social play as juveniles. It seems highly likely that play would serve a crucial role in our development as well, and that without it, we would suffer from a number of pervasive developmental differences.

*Human Play*

Despite the indications from animal research that play is important, it is difficult to state exactly what the significance of play is in human development. It would be impossible to carry out a “true experiment” exploring the outcome of play deprivation in children. Such an experiment would require randomly assigning participants at birth into control and experimental groups; the children in the experimental group would be prevented from playing throughout their development. The right to engage in play is protected by the United Nations’ Convention on the Rights of the Child; therefore such an experiment would surely be unethical. However, researchers have used other methods to learn about the importance of play and have spent much time attempting to draw conclusions about the results.

There are several different possible relationships between play and development in humans, outlined in Lillard et al. (2013). One hypothesis is that play is crucial for positive development. Another is that play is one of many routes to positive development. Yet another is that play is an epiphenomenon of other factors that facilitate development. The field of play research is far from being at a consensus regarding which of these models most closely resembles the true relationship between play and development. For the time being, all that can be stated definitively is that there is some evidence that development of play skills correlates in some way with development of other skills in typically developing children. Various studies have linked play to the development of perspective-taking skills (Burns & Brainerd, 1979), self-regulation skills (Elias & Berk, 2002), positive emotional development (Lindsey & Colwell, 2013), and social skills (Howes & Matheson, 1992).

Of particular importance for this thesis is the relationship between play and language development. Language requires symbolic understanding, or the ability to use one thing to stand for another; symbolic play arguably requires the same understanding. A number of studies have found

evidence that the development of play skills correlates with the development of certain language abilities, even when controlling for chronological age and other factors. Casby and Corte (1987) found that children who had begun combining words into phrases demonstrated significantly more representational ability in play than children at the single-word level. Jurkovic (1978) found that children whose play was found to be more highly organized scored better on measures of the ability to relate and organize concepts and express concepts verbally when compared to children with lower levels of play organization. A study by Lewis (2000) showed that ratings of children's symbolic play significantly correlated with their expressive and receptive language abilities, while functional play correlated only with expressive language abilities. Lyytinen et al. (1999) found that the vocabulary production and symbolic play of 14-month-olds predicted their language and cognitive skills at two years old. Shore (1986) found that the complexity of children's symbolic play with "counterconventional" toys (toys that did not belong in the scene and that had their own functional purpose; for example, a flashlight in a field of toys related to a dog) and the number of different block structures that children built were predictive of use of multiword utterances. These studies do not give us the ability to state that play development causes language development or vice versa, but they give us an indication that the two domains are related somehow, perhaps sharing underlying processes. This is evidence that play might be an important factor in the positive development of children.

Play might be a particularly important factor for one group of children – those with autism. Individuals with autism spectrum disorders have noted differences in the development of play. If play is as important as some research indicates it might be, this leaves individuals with autism at risk of being deprived of something that could be crucial to multiple domains of their development, including language development. The effectiveness of interventions involving play for children with autism support the idea that play is central to the experience of autism, and that supporting the development

of play is a way to support the overall positive development of individuals with autism (Wolfberg, 2009).

#### Barriers to Play:

##### Differences in Play Development in Typically Developing Children and Children with Autism

Children with autism experience many barriers to participation in play. These barriers could be divided into two categories: play-specific barriers and play-external barriers. Play-specific barriers are differences in the development of actual play skills in children with autism. Play-external barriers are other differences that prevent children with autism from having access to inclusion in play experiences with peers.

Play-specific barriers include differences in the nature of the play skills that children with autism develop. These differences appear to be related in some way to some of the core characteristics of autism, including restricted and repetitive behaviors (American Psychiatric Association, 2013) and weak central coherence (Frith, 2003). The divergence from typical play development in children with autism begins early in life with the emergence of toy play. Typically developing children begin manipulating objects in the first year of life, using a variety of objects in a variety of ways. Children with autism are observed to have less variety in their object manipulation play, and only play with a restricted selection of objects (Ungerer & Sigman, 1981). It has been observed that young children with autism focus their attention during play more on details of objects, rather than combining those details into a meaningful whole (Van Bercklaer-Onnes, 1994). The purpose of their object play seems to be the object manipulation itself, while typically developing children play with objects in order to explore and learn more about the object and its purpose. Infants with autism also show fewer functional play behaviors and more non-functional play behaviors than typically developing infants do (Christensen et al., 2010). This restricted, detail-oriented pattern is one that is seen across many

behaviors in individuals with autism, and continues into the development of relational play, which emerges next. Typically developing children begin using objects together in varied and novel ways, while children with autism more often combine objects in stereotyped or repetitive ways, such as banging two blocks together. Focus remains on details of objects rather than the gestalt.

Play-specific barriers continue in children with autism throughout the development of symbolic and pretend play. These more advanced forms of play are again impeded by barriers related to the core characteristics of autism. Children with autism have been observed to demonstrate difficulties with symbolic thought in general, perhaps due to a characteristic rigidity in thinking (Frith, 2003). Symbolic thinking requires allowing one thing (the signifier) to stand for another (the signified). In symbolic play, children let one thing stand for another. As stated earlier, this might have something to do with why the development of symbolic play and the development of language seem to be linked, since both require the ability to interpret or create both a signifier and a concept that is signified. Elements in the play interaction have a different meaning in the pretend world than they do in the real world. In early pretend play, children can substitute or imagine actions, objects and events. For example, a block could stand for a car, and moving the car across the floor could stand for driving the car down an imaginary road. This is an example of basic symbolic play.

Wolfberg (as cited in Schuler, 2003) provides an apt description of the observed play of a nine-year-old girl with autism, which illustrates the above differences:

Teresa demonstrated only a limited repertoire of spontaneous play activities. Initially, she routinely manipulated objects on the basis of common features such as size or color. For instance, she would line up toy cars at a particular angle or stack all the red blocks together. Later, she engaged in more functional forms of play that incorporated fixations and fascinations along with rotely memorized play scripts. For example, she repeatedly combed a doll's hair without evidence of any awareness of the implications of the action. Rather than treating the doll like a make-believe baby, she related to the physical properties

of the doll as any other object. She did not hold the doll like a baby, or gaze at the doll in an affectionate manner, or talk or vocalize while combing in any way indicative of pretence. As so often observed in children with ASD, Teresa's apparent play behaviors were of a stereotypic and solitary nature, and best described as 'echoplaylia' – defined as the literal immediate or delayed repetition of play behaviors exhibited by others (462).

Schuler (2003) points out that this child's play is rigid and focuses on object manipulation rather than a meaningful, exploratory relationship with a toy. Her play differs from that of a typically developing child in that it doesn't involve flexible, novel actions or any observable use of symbolic thought.

Later in their play development, children also manipulate roles, place and time as part of a sociodramatic play narrative (Deunk, Berenst, & De Glopper, 2008). For example, one child takes on the role of the doctor and one child takes on the role of the patient, and the two act out the setting of a cast for a broken arm. Again, this type of play requires flexible thinking skills; to interpret the multiple layers of representation involved in a play narrative is difficult if one has rigid or restricted thought patterns. This is exactly the type of thinking that is characteristic of many individuals with autism.

The development of sociodramatic play is also affected by the challenges that individuals with autism experience in understanding theory of mind concepts (Baron-Cohen, 1997). Sociodramatic play involves mentally assuming the role of a character and carrying out a storyline using that character's accompanying roles, behaviors and mental state. Vygotsky (1980) describes this type of play as being "rule-based"; players must be aware of the "rules" of behavior that go along with the roles that they take on during play. Vygotsky writes, "The child imagines himself to be the mother and the doll to be the child, so he must obey the rules of maternal behavior" (94). Children with autism might have trouble being able to guess at the "rules" that would be involved in behaving as their character would, since doing so involves being able to understand something about the nature of another person's mind. The actions of other play participants must also be interpreted through the

lens of their respective characters and the “rules” that go along with them. When involved in a play interaction with a peer who is pretending to be a doctor, the child with ASD must not only have some understanding of the mental state of the peer, he must understand the mental state of the peer’s doctor character. The requirement of these multiple layers of theory of mind skills makes sociodramatic play a challenge for many children with ASD.

The ability to produce narratives is another challenging factor that children with autism run into during sociodramatic play. Children with autism have been observed to have difficulty with producing narratives that are comparable in length to their typically developing peers (Tager-Flusberg, 1995). Some researchers even go as far as to suggest that lack of narrative thought might be the primary disability involved in autism (Bruner & Feldman, 1993). At any rate, narrative skills would certainly be helpful during sociodramatic play, because children engaged in this type of play generally work together to create a play narrative, which can include characters, setting, and a sequence of plot events and consequences. These are just a handful of the play-specific barriers that children with autism encounter in a play interaction.

Play-external barriers are other differences in the development of children with autism that prevent them from being able to enter into peer play situations. There are many elements to a play interaction, apart from the actual playing that takes place. Children must have the social initiation skills needed to start a play interaction with another child or enter into an interaction that is already taking place. If attempts at social initiation and interaction are unconventional, they might be ignored, misinterpreted or ridiculed by potential playmates. Although children can play together without talking, it helps to have language and social pragmatics skills in order to discuss what will be played and how, and carry on the dialog that children usually engage in as they regulate the play interaction together. It also helps to have a sufficient attention span in order to attend to the play interaction for

its entirety. Emotional regulation skills are needed to deal with any positive or negative experiences that might occur as part of the play interaction. In addition, sensory regulation skills are needed so that the child can participate in the play experience without becoming dysregulated. These are just some of the skills that could be required in order to have a chance at being part of a peer play interaction, besides the skills that are involved in the actual play act. Unfortunately, initiation, conventional social interaction, expressive language, social pragmatics, attention, emotional regulation and sensory regulation are all potential areas of challenge for children with autism. One could say that the cards are stacked against children with autism when it comes to participating in play; there is such a long list of developmental factors that limit access to play for these children.

In fact, lack of access to play can be seen as one of the defining characteristics of the autistic experience (Wolfberg, 2009). It should be noted that individuals with autism share some behavioral characteristics with animals that have been deprived of play experience. As described earlier, rats that have been prevented from engaging in peer play show changes in social development, reactions to the environment, and learning abilities. Parallels can be drawn between these behaviors and those of individuals with autism; we know that individuals with autism show disturbances in social development, often have high levels of anxiety, and have rigid patterns of behavior and self-regulation challenges that make adapting to new environments or transitioning between activities difficult. One could say that individuals with autism show signs of classic play deprivation, as observed in other species. If this is the case, by exposing children with autism to opportunities for play and supporting the development of their play skills, we could be addressing one of the fundamental features of the autistic condition, which could have positive outcome across domains, including language development.

It's challenging to determine the nature of the relationship between the core characteristics of autism and the results of play deprivation. In fact, it's hard to tell if these two things are even different at all. Do children with autism develop play differently because of the characteristics of autism? Or do they display the characteristics of autism because they develop play differently? Is autism really just play deprivation? These questions are far from being answerable at this point in time. However, some research is starting to address this question by exploring the effects of play intervention on the development of children with autism. It seems that play intervention addresses many of the core challenges of autism. If children with autism are suffering from play deprivation, then providing them with supported opportunities to engage in play early enough in life should ameliorate some of the "symptoms" of autism, including disordered language development. There is some promising research about the positive effects that interventions focusing on play can have on the development of children with autism. Young children with autism who are given a chance to play and the supports needed to do so would be comparable to the aforementioned rats that were raised in isolation but given a chance to play with a peer for one hour per day, and later showed no negative effects from the isolation.

One example of a play intervention for children with autism is Integrated Play Groups (Wolfberg & Schuler, 1993; Wolfberg, 2009; Wolfberg et al, 2015). This intervention guides children with autism "to participate with typical peers in mutually engaging experiences in natural settings" (Wolfberg et al., 2015). Integrated Play Groups has been shown to lead to increases in the play skills of children on the autism spectrum. Wolfberg et al. (2015) demonstrated in a study using a repeated measures design that children on the autism spectrum showed an increased rate of social play engagement and symbolic play acts during unsupported play with unfamiliar peers after participating in a twelve-week IPG intervention. Further analysis of the data is needed as to what impacts Integrated Play Groups might have on other areas of development.

### Effect of Play Interventions on Language

As discussed earlier, there is some evidence that the developmental processes underlying play and language might be related, although the nature of this relationship is difficult to determine. If play and language are indeed related processes, then targeting one in intervention might serve to increase skills in both areas. Also, if giving children with autism supported opportunities for play addresses the core challenges of autism and results in an overall shift towards more typical patterns of development, then we would expect to see language development affected as well.

Schuler (2003) argues that supported dramatic peer play could be one of the most effective ways to target language development in children with autism. She argues that it could help children with autism who are having trouble acquiring language unlock “a symbolic mode of mind” (456). According to Schuler, play can be used to “establish narrative activity and thought” through “multiple, yet naturalistic teaching trials” (456). In a dramatic play scenario, children with autism are given opportunities to practice many areas of challenge – producing narratives, using flexible thinking, and taking the perspectives of others, just to name a few. She points out that these opportunities can be presented over and over in a play context; in the pretend world, there is no limit to the number of times that you can order an ice cream cone if you are playing ice cream store. However, in the real world, there is (ostensibly) a limit to the number of ice cream cones that one can order in an actual ice cream store. Thus, a dramatic play context gives the child potentially limitless trials to practice language goals, allowing a myriad of opportunities to develop narrative skills, symbolic skills, and other skills related to language. This makes play the perfect context for helping children with autism develop language.

Unfortunately, fairly little research has been conducted to determine the effect of play interventions on the language skills of children with autism. In the study by Wolfberg et al. (2015),

which showed that participation in an Integrated Play Groups intervention led to increases in social play engagement and symbolic play skills in children with autism, the intervention's impact on language and communication skills was not considered. But some very small, earlier Integrated Play Groups studies gave some preliminary evidence that participation in the intervention might result in increased language output and increased variety of communicative functions. In their 2001 study Zercher et al. demonstrated that participation in an Integrated Play Groups intervention resulted in an increase in rate of verbal utterances produced during play for two elementary school aged children on the spectrum. In addition, Wolfberg and Schuler (1993) showed that two of the three elementary school aged participants with ASD showed gains in language after informal analysis of verbal interactions during play group sessions and individual play assessments. They were found to produce higher rates of verbal output with a higher mean length of utterance (MLU) following the intervention. Their increases in pragmatic language included use of a greater variety of linguistic forms and communicative functions, particularly an increase in their use of socially referenced communication. Schuler (2003) further described the language gains of a participant in a study by Wolfberg (1999), drawing parallels between her increases in flexible, symbolic play and her increases in novel, symbolic utterances; as her play skills increased, her use of delayed echolalia reduced considerably and was replaced by more appropriate communication with a variety of linguistic forms and functions.

None of the studies above noted any differentiation between language performance during different types of play activities. As described earlier, there are many different types of play that emerge at different developmental stages, and most or all of these types of play are impacted in children with autism. Professionals working with this population have little or no evidence to go on when making decisions about what type of play activities should be targeted during intervention in order to have the most positive impact on the child's language development.

More information is needed about how play intervention affects language output in children with autism and whether one type of play context or another is more effective for increasing language output. This study seeks to measure any impact that participation in an Integrated Play Group might have on quantity of language output. It involves a secondary analysis of the data gathered during Wolfberg et. al.'s 2015 study, specifically, video recordings of children with autism engaged in free, unsupported play with two unfamiliar typically developing peers, both before and after participating in an Integrated Play Groups intervention. During these play sessions, the children were given first a ball, then blocks, then a set of thematic toys to encourage sociodramatic play such as a doctor's kit or hairdresser's kit. It is hypothesized that the children with autism will be found to produce higher rates of utterances during the post-intervention play videos when compared to the pre-intervention condition. This is based on the alleged relationship between play and language skills that was described in this literature review. If the Integrated Play Groups intervention leads to increases in the play skills of children with autism, and play and language are related processes, then language skills might experience an increase as a result of the intervention as well. If this is found to be the case, then any interventions that address and reduce play-specific and play-external barriers for children with autism could also serve to facilitate language development.

It is also hypothesized that the children with autism will be found to produce higher rates of utterances while sociodramatic play is occurring, when compared to ball play and constructive play with blocks. As described earlier, sociodramatic play targets many areas of need for children with autism. This could lead one to think that children with autism would talk less during this type of play; however, it is hypothesized that sociodramatic play will involve more opportunities for talking than ball play or constructive play will. Since sociodramatic play usually involves negotiation between players in the mutual development of a play narrative including roles and plot, there is a higher demand for conversing than there might be when simply throwing a ball back and forth or stacking blocks in

a tower. If the typically developing children are producing higher levels of language output during the sociodramatic play condition, it's possible that the children with autism will join them in talking more during this type of play activity. In addition, sociodramatic play normally develops later than object manipulation and constructive play, and it is associated with higher linguistic and cognitive demands, which could make it more engaging, making children more motivated to speak. If this is the case, sociodramatic play could be an appropriate scenario for professionals to target in order to give children with autism the most opportunities to practice their language skills.

#### The Primary Study -

Wolfberg et al (2015)

The current study is a further analysis of existing data. Dr. Pamela Wolfberg et al. collected videos of children with diagnoses of ASD involved in play interactions with typically developing peers for the study that was published under the title *Integrated Play Groups: Promoting Symbolic Play, Social Engagement and Communication with Peers across Settings in Children with Autism* (Wolfberg et al., 2014). Some of these videos were reviewed, coded and analyzed for the current study.

All of the participants in the current study were participants in the primary study. The primary study involved 48 children (ages 5-10) with confirmed diagnoses of autism at play with a total of 144 typically developing children (ages 5-10). 54 of the typically developing children participated in the IPG intervention and 90 were unfamiliar to the children with ASD and participated in free play observations. All participants were recruited from local schools and after school programs in San Francisco and surrounding areas. The children are from culturally, ethnically and socio-economically diverse backgrounds. Participants were selected for inclusion in the current study based on observation of videos. The selection criteria are described in detail in the methodology section.

During the primary study, each participant with ASD was involved in approximately 15 minutes of free play with two unfamiliar typically developing peers at three points throughout the intervention – before, during and after. For the current study, the pre-intervention and post-intervention free play videos were reviewed. Each of these videos involved one child with ASD and two unfamiliar typically developing peers who were given three different toys to play with for at least five minutes each. The adult facilitators directed the children to stay in a designated area (usually a rug or small section of a classroom). The adult facilitators then gave the children a toy and instructed them to play with it together however they liked. The children were first given a ball (a small ball or a yoga ball), then a set of blocks or Legos, then a toy doctor's kit or a toy hairdresser's kit. The adult facilitators generally only intervened in the children's activities to re-direct a child who left the designated play area.

## METHODOLOGY

Participants were included in the current analysis if the following criteria were met during the free play interaction videos:

- At least one minute of ball play, one minute of constructive play and one minute of cooperative sociodramatic play occurred between at least two of the participants in both pre- and post-intervention videos. Note that the child with ASD was not required to be one of the active participants in the play interaction. All three children were required to be physically proximal to each other during the play interaction (within the area that the adult facilitators directed the children to play in).
  - One minute of ball play is defined as the following: Across one 60-second period, at least two children interact physically with the same ball.

- One minute of constructive play is defined as the following: Across one 60-second period, at least two children interact with blocks by arranging them in some sort of pattern or structure, either cooperatively or separately.
- One minute of cooperative sociodramatic play is defined as the following: Across one 60-second period, at least two children engage in a cooperative play interaction involving a sociodramatic play narrative, either verbally or non-verbally. The play narrative could be established through utterances or actions. An example of a play narrative established by utterances would be one child saying “I’m going to be the doctor” and the other saying “Doctor, I hurt my arm” (assigning roles and acting out a plot). An example of a play narrative established by actions would be one child using an object in a symbolic fashion that involves the second child that implies assigning roles and acting out a plot – for example, one child wrapping a bandage around another child’s arm or pretending to listen to her heart with a stethoscope.
- The child with ASD produced at least six utterances during the play interactions across all the videos.
- An utterance was defined as a speech act produced by the child with ASD, surrounded by at least two seconds of silence before and after the speech act. If the child produced a sequence of multiple sentences without a two-second pause between sentences, the sequence was counted as one utterance. If the child produced a pause of two seconds or more within a sentence, the pause was not counted as an utterance boundary and the sentence was still counted as only one utterance. If there was a pause of less than two seconds between sentences, but during that pause a peer produced an utterance to which the child responded, the utterance of the peer was considered to be an utterance boundary. Utterances were not

counted if they were explicitly directed at an adult, unintelligible, incomplete, or a repetition of an immediate previous utterance by self or another participant. Examples of what was counted as single utterances include (italicized numbers in parentheses represent pauses notated in minutes (m:ss), utterance boundaries notated with quotation marks):

- “Put the right pieces together. We need to put the right pieces together again so we can fix it. First, we need to put this together.” (*no pauses of two or more seconds*)
- “Tomorrow will be... (0:04) Tuesday?”

The following are examples of what was counted as two utterances:

- “The alligator is coming!” (0:05) “I need this!”
- Now I’m gonna need two of these.” (Peer: *Do you have to make a pattern?*) “Yeah I’m trying to.”

### *Methods*

The utterances produced by the children with ASD were counted and an average rate of utterances per minute was calculated for each participant across the conditions. Average rate of utterance per minute was used instead of total number of utterances because the amount of time spent in play varied considerably between participants. Some play interactions were more sustained than others. Using average rate of utterance controlled for this variability.

The average number of utterances per minute were calculated for the children with ASD during:

- pre-intervention ball play, post-intervention ball play, and combined (i.e., pre- and post-intervention) ball play
- pre-intervention constructive play, post-intervention constructive play, and combined constructive play

- pre-intervention sociodramatic play, post-intervention constructive play, and combined constructive play
- pre-intervention (all play types combined)
- post-intervention (all play types combined)

## RESULTS

The following table shows the mean rate of utterance per minute produced by the children with autism for each of the play conditions, along with standard deviations.

**Table 1: Conditions, Mean rates of utterance per minute, and Standard deviations.**

Type of Play	Pre-Intervention		Post-Intervention		Pre- and Post-Intervention Combined	
	Mean rate of utterance per minute	Standard Deviation	Mean rate of utterance per minute	Standard Deviation	Mean rate of utterance per minute	Standard Deviation
Ball Play	0.95	1.08	2.47	1.83	1.01	0.86
Constructive Play	1.07	0.77	1.55	1.42	2.04	1.88
Sociodramatic Play	1.61	2.20	2.29	1.93	1.92	1.44
All Play Types Combined	1.37	1.48	1.94	1.32		

A paired-samples T-test was conducted to determine any significant differences between the conditions. A  $p$ -value of  $<0.05$  represents a difference that was significant according to the T-test. A  $p$ -value of  $0.05-0.1$  represents a difference that could be considered as “trending” towards significant according to the T-test, and might have approached significance with a greater sample size.

Four pairs of conditions differed to a significant degree according to the T-test. Utterance rates for the sociodramatic play condition (pre- and post-intervention taken together) ( $M=1.92$ ,  $SD=1.44$ ) were significantly higher than in the ball play condition (pre- and post-intervention taken

together) ( $M=1.00$ ,  $SD=0.86$ );  $t(6)=3.06$ ,  $p=0.022$ . Utterance rates for the pre-intervention sociodramatic play condition ( $M=1.55$ ,  $SD=1.42$ ) were significantly higher than the pre-intervention ball play condition ( $M=0.95$ ,  $SD=1.08$ );  $t(6)=2.67$ ,  $p=0.037$ . Utterance rates for the post-intervention sociodramatic play condition ( $M=2.29$ ,  $SD=1.93$ ) were significantly higher than the pre-intervention ball play condition ( $M=0.95$ ,  $SD=1.08$ );  $t(6)=2.47$ ,  $p=0.049$ . Utterance rates for the post-intervention block play condition ( $M=2.47$ ,  $SD=1.83$ ) were significantly higher than the pre-intervention ball play condition ( $M=0.95$ ,  $SD=1.08$ );  $t(6)=3.76$ ,  $p=0.009$ .

Three additional pairs of conditions were “trending” towards significance according to the T-test. Utterance rates for the post-intervention block play condition ( $M=2.47$ ,  $SD=1.83$ ) were trending higher than the pre-intervention sociodramatic play condition ( $M=1.55$ ,  $SD=1.41$ );  $t(6)=2.00$ ,  $p=0.093$ . Utterance rates for the post-intervention block play condition ( $M=2.47$ ,  $SD=1.83$ ) were trending higher than the post-intervention ball play condition ( $M=1.06$ ,  $SD=0.77$ );  $t(6)=2.18$ ,  $p=0.072$ . Utterance rates for the post-intervention sociodramatic play condition ( $M=2.29$ ,  $SD=1.93$ ) were higher than the post-intervention ball play condition ( $M=1.06$ ,  $SD=0.77$ );  $t(6)=1.96$ ,  $p=0.098$ .

These findings are represented in the following table:

	<b>Utterance rates were higher during...</b>	<b>when compared to...</b>
Statistically significant differences ( $p<0.05$ )	Sociodramatic play (pre & post intervention)	Ball play (pre & post intervention)
	Pre-intervention sociodramatic play	Pre-intervention ball play
	Post-intervention sociodramatic play	Pre-intervention ball play
	Post-intervention block play	Pre-intervention ball play

“Trending” differences ( $p < 0.1$ )	Post-intervention block play	Pre-intervention sociodramatic play
	Post-intervention block play	Post-intervention ball play
	Post-intervention sociodramatic play	Post-intervention ball play

**Table 2: Statistically significant and trending differences between conditions.**

The following graphs represent the data:

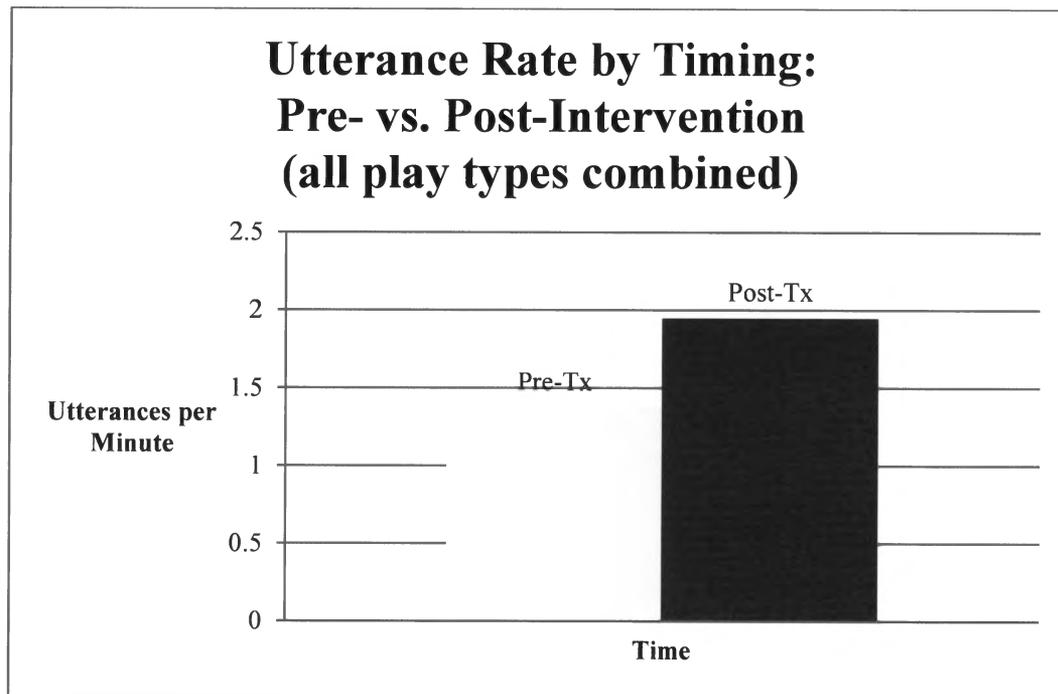


Figure 1: Utterance rate by timing: Pre- vs. Post-Intervention (all play types combined).

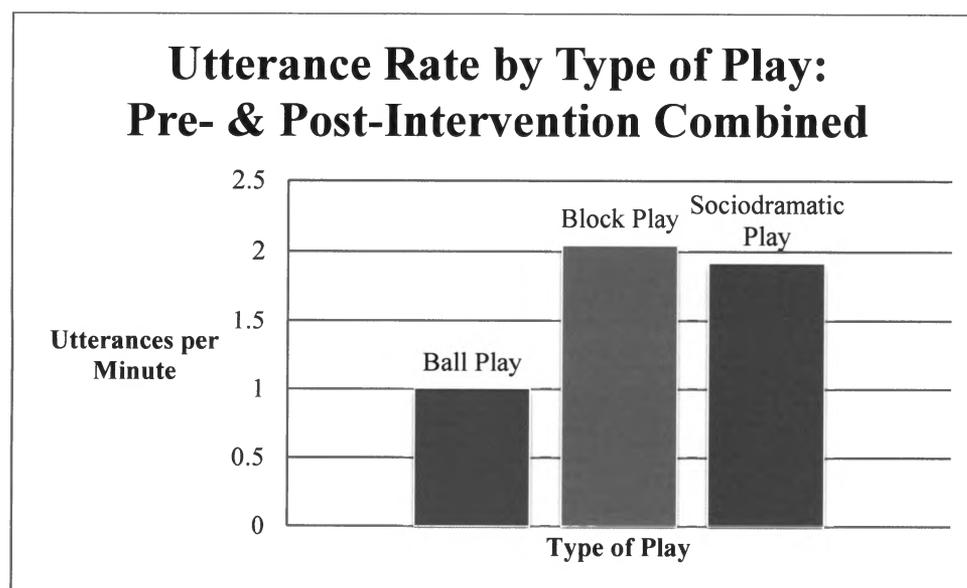
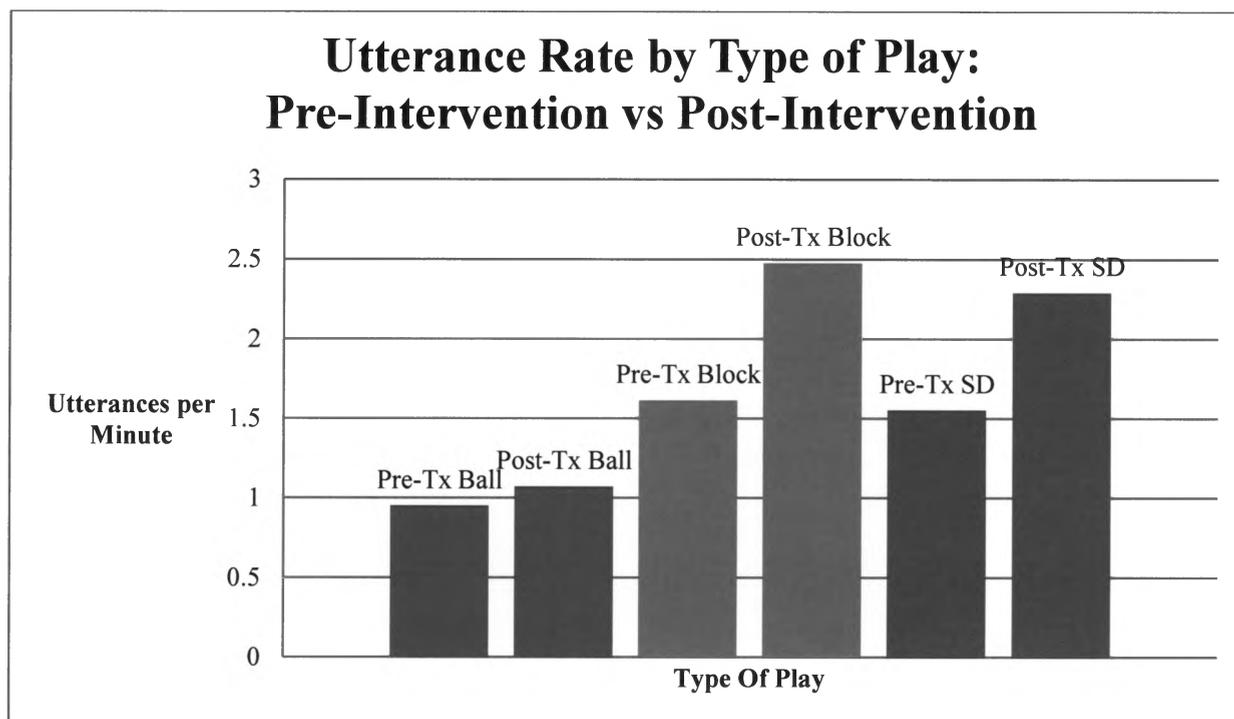


Figure 2: Utterance rate by type of play: Pre- & Post-Intervention combined.



**Figure 3: Utterance rate by type of play: Pre-Intervention vs Post-Intervention.**

#### DISCUSSION

The results of this study provide some support for the use of sociodramatic play experiences with typically developing peers in order to elicit higher rates of verbal output from children on the autism spectrum. It also gives some limited support for the use of the Integrated Play Groups intervention as a means for increasing verbal output during play in children with autism.

It was found that overall, the children with autism produced a higher rate of utterances during the sociodramatic play context when compared to the ball play context. There was also some evidence that rates of utterances were higher during the block play context when compared to the ball play context, but this difference was not as conclusive. However it can safely be stated that the ball play context did not elicit a significantly higher rate of utterances than the block play context did. In general,

the strongest support was for sociodramatic play correlating with more verbal output from the children with autism, with block play likely coming in second.

There was also some evidence that the children with autism produced higher rates of utterances after participating in the Integrated Play Groups intervention, when compared to before the intervention. However, this distinction was inconsistent and was not significantly significant across all conditions. It was not the case that for each type of play, utterance rates in post-intervention play were higher than in pre-intervention play. Utterance rates during post-intervention sociodramatic play were higher than pre- and post-intervention ball play, but were not higher than pre-intervention sociodramatic play. The same was true for block play; utterance rates during post-intervention block play were higher than pre- and post-intervention ball play, but were not higher than pre-intervention block play. Also, when considering all of the play types taken together, the post-intervention utterance rates were not higher than the pre-intervention utterance rates.

Still, overall, when considering the significant and trending differences that emerged from all of the results, the utterances rates during the post-intervention play conditions were generally higher than the pre-intervention play conditions. There were three significant or trending differences in which utterance rates during one type of post-intervention play were higher than one type of pre-intervention play. There were no cases of utterance rates during pre-intervention play of any type being significantly higher than any post-intervention play types. In addition, there was at least one case in which a participant produced no utterances whatsoever during pre-intervention play, but produced a considerable amount of utterances during post-intervention play. So although the differences were inconsistent across the various types of play, in general the post-intervention conditions won out over the pre-intervention conditions in terms of utterance rates.

The results of this study brought out preliminary support for the use of sociodramatic play and, to a lesser extent, the use of Integrated Play Group interventions to increase verbal output during play in children with autism. It's possible that this evidence would have been stronger if the study had been more powerful with a higher number of participants. Generalizations can hardly be made based on a sample of only seven participants. However, the preliminary results that emerged suggest that replicating the study with a larger number of participants might reveal that these trends are indeed present, and strong enough to use as a basis for making recommendations.

There are several possible factors that could account for the finding of sociodramatic play eliciting higher rates of language output than ball play, as was expected in the hypothesis prior to this study. Sociodramatic play develops later in children than exercise play, such as ball play, does (Pellegrini & Smith, 1998). Since it is generally played by children who have gained a considerable level of language ability, it follows that this type of play would be associated with a greater use of language than earlier forms of play. In fact, if sociodramatic play doesn't actually require the use of language, it at least highly encourages it. It is possible to play silently with a ball; it is less likely (though not impossible) to silently assign roles and act out a plot. The demands of sociodramatic play are more likely to compel children to speak. The sociodramatic play interactions often included involved negotiations about who would play which role; this preliminary part of the play alone could require long discussions requiring high levels of verbal output. The same was true, in some cases, for block play; children engaged in conversations about what they were building, and negotiations about what they wanted to build together. There is simply less to talk about when throwing a ball back and forth. In addition, sociodramatic play could be considered to be a more advanced form of play than ball play in terms of the cognitive and social skills that are used. Simply understanding how to engage in sociodramatic play arguably requires symbolic understanding, theory of mind skills, and flexible thinking, along with the myriad social skills needed to maintain a positive interaction with the other

players. Since this type of play targets higher cognitive processes than exercise play does, it might involve higher brain activity, which could stimulate language production.

The preliminary finding that the children with autism experienced an increase in language output following participation in the Integrated Play Groups intervention (Wolfberg et al., 2015), at least in certain conditions, is also expected based on several factors. The 2015 study found the children to have increased their social play engagement and symbolic acts following the intervention. The children might have been better able to participate in the play that was occurring after having participated in the intervention since they had attained higher levels of play skills and social engagement; this might have led to them being more engaged overall in the play experience, and thus more talkative. This increase in language output also makes sense given the results of the animal play studies described earlier and their possible link to autism spectrum disorders. If play deprivation is truly a factor in the developmental differences that we observe in individuals with autism (Wolfberg, 2009), it's possible that participating in play experiences could ameliorate some of the features of autism by targeting one of the core aspects of the disorder. Since disordered language is part of the profile of autism (American Psychiatric Association, 2013), we might thus expect language skills to increase after the individual has been exposed to play intervention, as we saw, to some extent, in this study. It should be noted though, that since this study not only included a smaller sample, but also included some extra data that was not analyzed in the Wolfberg et al. (2015) study, it is not possible to make accurate comparisons of the findings for each study.

This study has some clear preliminary implications for clinical practice. In order to increase language output in children with autism spectrum disorders, clinicians should consider targeting sociodramatic play during interactions with typically developing peers, rather than exercise play such as ball play. It should be noted that in this study, there was no specific participation required on the

part of the child with autism. The utterance rates were found to be influenced by the type of play context that was occurring; this did not include any requirements that the child with autism be engaged in the play in any specific way. It seemed that just the fact that sociodramatic play was occurring led to an increase in utterances in the children with autism. Thus just the act of providing toys that might elicit sociodramatic play to a group of children, including a child with autism, might serve to increase the language output of the child on the spectrum. Clinicians should also consider participation in a play intervention, particularly one that involves interaction with typically-developing peers, such as Integrated Play Groups, to possibly increase rates of verbal output in children with autism.

Clinicians should also begin to recognize play as a potentially crucial factor in positive development, especially for children on the spectrum. Play is becoming recognized as a core part of the autistic experience (Wolfberg, 2009). Children with autism have the right to play, and as clinicians we have the responsibility to support this part of their growth; in doing so we may be able to facilitate the development of skills that would otherwise be out of reach for individuals on the spectrum.

#### Limitations

There are several limitations to this study that should be noted. First, a major limitation of this study is the small sample size that was used. In addition, during each free play observation, the toys were presented to the children in the same order. Each play session began with the children playing with a ball, then playing with blocks, then playing with either a toy doctor's kit or a toy hairdresser's kit. Utterance rates could have been higher during sociodramatic play because by the time the children were playing with the third toy, which was the context for sociodramatic play in each case, the children had warmed up to each other and were more engaged in the play than they were at the beginning. In addition, there was no control group used, so somewhat higher utterance rates in

the post-intervention condition could have been a result of time passing and the children experiencing normal language gains.

The results of this study are difficult to generalize to children of varying skill levels, because participants who did not produce at least five utterances across the play videos were not included in the study. Though some of the children who were included had language skills that seemed to still be at an emerging level, there were no participants who were completely “non-verbal” during the play videos. It would be very worthwhile to explore what types of play contexts and interventions could be efficacious for use with children who are producing little or no spoken language.

#### Future Directions

More research is needed to explore the effects of play context and play interventions on language output and other aspects of communication. Potential other areas of communication that could be explored include joint attention, shared reference, variety of communicative functions, complexity of utterances, etc. In addition, it would be worthwhile to research the effects of this intervention on the communication of children with autism with a broader range of skill levels, particularly a broader range of communication skills, since as mentioned above, this study only included children with at least some level of verbal output. It would be helpful to know if play context and play interventions have differing effects on children who are at different communication stages.

Another aspect that would be interesting to research would be the effect of play context on typically developing children. The literature review for this study did not turn up any research as far as differing levels of language output in typically developing children based on what type of play is occurring. It would be helpful to know if typically developing children follow the same pattern as was observed in the children on the spectrum in this study, with sociodramatic play eliciting higher rates of language than ball play. In addition, it might be interesting to know if the level of language output

of typically developing children could increase after participating in a program similar to Integrated Play Groups, but not directed at children with autism, that supports the development of play skills.

Future research should also include replicating this study with a larger number of participants using the existing data collected within the context of the unfamiliar peer play assessments before and following the IPG intervention. If this replication results in positive outcomes, a worthwhile next step would be to analyze existing data comparing children's utterances while playing with peers within the context of the 12-week Integrated Play Groups intervention.. Further analyses within the context of this and future larger-scale studies of the Integrated Play Groups intervention, including a randomized controlled trial if feasible, may allow for comparisons of children's spontaneous and elicited language while guided in sociodramatic play. Following this, comparing the Integrated Play Groups model to other interventions with similar outcome measures would be valuable for aiding in clinical decisions.

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