PRETEND PLAY AND CHILDREN WITH AUTISM SPECTRUM DISORDER: DEFICITS AND INTERVENTIONS

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Abstract

Pretend play is a critical social and linguistic interaction for children and a milestone in child development. A review of 34 peer-reviewed articles and books confirms a distinct deficit in the pretend play of children with autism spectrum disorder (ASD). Pretend acts by children with ASD are simpler, more restricted, and occur less often than children without ASD. Pretend play can be taught to children with ASD or facilitated with shown benefits in the frequency and quality of pretend play, social skills, and language development. Positive impacts of pretend play facilitation and social behavior include improved appropriateness, increased peer interactions, and more novel play. Language benefits of pretend play facilitation are increased speech, more appropriate speech, a rich context for language acquisition, and expressive and receptive language improvements. The facilitation of pretend play through peer modeling, adult modeling, video modeling, least-to-most prompting, and pivotal response training is effective and should focus on generalization and maintenance of acquired skills. Future research should examine solitary pretend play and the creation of a universal scale for pretend play behaviors.

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Pretend Play and Children with Autism Spectrum Disorder: Deficits and Interventions

Imagination enriches play as children discover new worlds and open doors, transforming any room or playground into a different country, jungle, or ocean. The scintillating experience of pretend play, or play in which the imagination is used to create the context of the play, is unique for each child as the same context creates a different reality in each individual's mind. All involved can enjoy a collective social experience of a game or journey within the same context, while each individual learns and explores their own perception and creation of the creative environment. Due to its complexities, pretend play is a distinctly human characteristic and an important phase of a child's development (Rutherford & Rogers, 2003).

Pretend play is a critical social interaction for children as well as an effective classroom and intervention tool. The notion that all children participate in some form of pretend play is questioned when the play characteristics of children with autism spectrum disorder (ASD) are considered. Pretend play acts as a crucial element of human thought development and the disparity in pretend play in children with ASD requires examination (Rutherford & Rogers, 2003). Pretend play is equally significant for children with ASD, as it is for those without, in regards to their development of social skills, appropriate behaviors, play habits, language, and creativity (Barton, 2010).

The purpose of this literature review is to consider the difference in pretense, frequency, generativity, and manifestation of pretend play for children with ASD in comparison to children without ASD. Benefits, complexities, and methods for cultivating pretend play in this population of children will also be discussed. In addition, the review will

examine the role of pretend play in the context of the developmental norms of play, the differences in pretend play for children with ASD, and the range of benefits of facilitating pretend play for such students in educational and home environments.

Methods

The literature in this review was gathered from diverse sources. Initially, an electronic search was completed using both the Ebsco and Google Scholar databases. Key search terms consisted of: pretend play, imaginative play, symbolic play, autism, autism spectrum disorder, ASD, intervention, education, and youth. Articles focused primarily on children with ASD in comparison to children without a diagnosis of ASD and their pretend play behaviors. Some authors examined the differences in pretend play in children with ASD, and others assessed the benefits of pretend play as an intervention. Other articles hypothesized theories as the author(s) attempted to detail the cognitive elements underlying pretend play deficits in some children. Additional articles focused on types of pretend play facilitation and intervention in a classroom setting and the effectiveness of specified methods.

Selected articles were published largely since 2001 in peer-reviewed journals or books. Articles published within the last fourteen years contain more relevant research and are more reflective of the current understanding of both ASD and pretend play; although two articles were included from 1995, one article from 1987, one from 1979, and one article from 1977 as they are foundational to many more current articles. Additionally, the older articles provide background for the development of pretend play as an intervention tool and the origin of theories regarding pretend play. From references in the initial set of articles, a search was conducted which yielded a total of 31 relevant articles and three books.

Pretend Play Differences in Children with ASD

Children must meet specific requirements detailed in the Diagnostic and Statistical Manual of Mental Disorders (DSM) to qualify for a diagnosis of ASD. Criteria for such a diagnosis is based here on the DMS-IV, since all of the articles used in this literature review employed that criterion. However autism spectrum disorder (ASD), the term from the DSM-V, will be used in this literature review rather than the many subtypes listed in the DSM-IV (Vivanti et al., 2013). This ensures consistency of terms when describing article content and study results and utilizes the most current terminology in the fields of special education and psychology. Characteristics of ASD, according to the DSM-IV, are deficits in social interaction, communication, and the presence of restricted, repetitive patterns of behavior or interests. These three criteria for ASD are sometimes referred to as the autistic triad (Rellini, Tortolani, Trillo, Carbone, & Montecchi, 2004). In earlier diagnostic assessments for autism, imagination was the third characteristic of the triad, with a focus on pretend play, which addresses the behavioral manifestations of ASD (Wing, Gould, Yeates, & Brierly, 1977). The difficulties in imagination and behavior are now defined in terms of restricted and repeated behaviors or interests. Many diagnostic systems used for ASD, such as the Autism Diagnostic Observation Schedule, still include a lack of symbolic play with toys or objects, such as dolls, as a diagnostic element of the scale or system (Rutherford & Rogers, 2003). ASD is often comorbid with intellectual disabilities, language-based disabilities, seizure disorders, ADHD, sensory processing disorders, and pica (Matson & Nebel-Schwalm, 2007).

Pretend play differs from other types of play because of its nonliteral or symbolic nature (Barton, 2010). According to Rutherford and Rogers (2003), pretend play is an important aspect of child development and provides an opportunity to witness and assess a

child's language development, ability to think symbolically, and act out social roles. The development of pretend play occurs simultaneously with dramatic increases in language use and vocabulary (Barton, 2010). Pretend play consists of creating imaginary events and altering the identities of objects, persons, and environments (Rutherford & Rogers, 2003). Typically developing children have been found to engage in pretend play beginning between 9 and 24 months old (Nicolich, 1977). Children who show the most profound differences in pretend play are those with visual impairments or ASD (Rutherford & Rogers, 2003). This literature review will focus on children with ASD.

Deficits in pretend play for children with ASD manifest differently in each child depending on their position on the spectrum, among other factors (Rutherford & Rogers, 2003). Regardless of variation in manifestation, differences in pretend play in children with ASD remain widely recognized as a significant aspect of ASD (Rutherford & Rogers, 2003). Some consider the low frequency, limited diversity, or lack of symbolic play skills in children with ASD a core developmental impairment (Kasari, Chang, & Patterson, 2013). One study compared children with ASD to a control group composed of children with learning difficulties or developmental delays and matched the children based on verbal ability (Hobson, Lee, & Hobson, 2009). In the study, a period of play without modeling preceded a period of modeled play with a familiar adult and a baby doll. The children with ASD were found to have equivalent executions of the mechanics of play, such as metarepresentation and flexibility with toys, as the children in the control group (Hobson, Lee, & Hobson, 2009). However, there were significant differences in the children with ASD in exhibiting qualities of playful pretend, such as awareness of self as creating meanings, investment in symbolic meanings, fun [defined as showing some pleasure or amusement],

and creativity, or the ability to introduce new ideas (Hobson, Lee, & Hobson, 2009). Other researchers utilized different criteria for pretend play behaviors, such as nonliterality, positive affect, and intrinsic motivation, but all studies found some deficit in pretend play in children with ASD (Kasari, Chang, & Patterson, 2013). The differences in criteria can be explained by the variety of pretend play factors and skills studied and the criteria chosen is specific to the topic of each individual study. Therefore, the studies must be critically examined in relation to the particular qualities of pretend play addressed in each study and interpreted only as applicable to the characteristic(s) specified by the researchers. Pretend play differences in children with ASD are not a delay but rather a deviation in complexity and frequency (Thorp, Stahmer, & Schreibman, 1995).

One commonly studied deficiency is the child's comprehension of pretense, or their ability to understand the pretend aspect of the play acts (Jarrold, 2003; Kasari, Chang, & Patterson, 2013; Leslie, 1987; Lewis & Boucher, 1995; Mastrangelo, 2009). A review of pretend play research conducted by Christopher Jarrold in 2003 found that pretend play occurs less frequently in children with autism and lasts a shorter amount of time, even when compared to children in other disability categories. The child's awareness of how non-existent properties or objects are being represented is essential to whether the child is truly pretending. A child needs to understand symbolism, or how an object can act as if it is something else, for the child to be able to comprehend the play act; yet not all children with ASD were shown to comprehend pretend acts. However, there is a flaw in observing pretend play in that the observer cannot distinguish between what is actually pretend play unless there are accompanying actions or vocalizations associated with the pretend act. For children with the language and social delays or deficits as is characteristic of autism, this adds an

additional complicating factor since they may be less likely to vocalize about the play act. Even when actions or verbalizations are present, it is still only an inference whether the child is truly using his or her imagination during play or simply imitating a previously seen act (Jarrold, 2003). The difficulty is in determining whether children are performing expected pretend acts or truly playing with pretense, which becomes a determination between performance and competence (Kasari, Chang, & Patterson, 2013). This can sometimes be distinguished by assessing the novelty of the pretend act (Jarrold, 2003).

According to a study by Low, Goddard, and Melser (2009), generativity, or the ability to produce novel ideas independent of prompting, is another key element of pretend play and often an area of deficit for children with ASD. A study of 52 children used imaginative drawings of funny and strange-looking people to determine a child's creative and generative capabilities through Karmiloff-Smith's (1990) imaginative drawing task, along with other tasks that focused on measuring theory of mind, receptive language, and executive functioning skills. The authors found that children with ASD produce pretend play at a slower rate than a control group, which supports evidence of a deficit in generativity. The rate of pretend play production is increased with external prompting, which requires less generativity from the child and is consistent with other findings of decreased generativity in children with ASD. The 27 children with ASD in the study had significantly lower scores on the generativity measurement, visuospatial planning, and theory of mind tasks. However, the study used imaginative drawing as the demonstration of the child's generativity, which may also be attributed to a child's lack of desire to create new visuospatial drawings over familiar graphics rather than a lack of generativity. The study resulted in more than half of the children with ASD creating an imaginative picture, while 93% of the control group produced

a picture containing imaginative features. The deficit in generativity was present when children with ASD were compared to the control group but there was not a complete incapacity to generate imaginative ideas in children with ASD (Low, Goddard, & Melser, 2009).

One foundational study conducted by Lewis and Boucher in 1995 found that the toy or object used to test generativity was significant because different toys affected the results and whether the child with ASD was able to generate original ideas for play. The study found that generativity was not impaired when a child with ASD played with a doll while there were generativity deficits when playing with a toy car. Children with ASD were significantly more capable of creating ideas with the doll than the car. This difference was also reflected in the group of children with learning disabilities and the group of typically developing children; though the disparity in the mean proportion of original ideas between the toys was nearly double in the group of children with ASD. The authors of the study hypothesized that the movable parts and flexibility of the doll may have made it easier to pretend play when compared with the fixed body of the car. It was also not simply the presence of toys that cued pretend play acts and novel ideas in children with ASD (Lewis & Boucher, 1995).

Pressure to produce play might have also been a factor in children's generativity, since cues increased the amount and variety of pretend acts. Children with ASD are not incapable of pretend play, nor is pretend play defined simply by generativity or pretense, but the spontaneous acts of pretend play by children with ASD, which are typically limited and repetitive, were more frequent when given play props and cues (Lewis & Boucher, 1995). Thus, the prompting or facilitation of pretend play significantly affects the child's generativity and can aid in comprehension of the pretend act.

An additional factor found to be significantly related to the lack of pretend play is the communication difficulties of children with ASD, which could negatively affect shared or interactive play scenarios. One study by Douglas and Stirling (2012) examined the metacommunicative strategies of five children with ASD during pretend play with adult partners. Researchers observed both linguistic verbal communication and nonverbal signaling by the participants. Observations were based on the premise that metacommunication was necessary for those involved in the play to achieve collective intentionality, or the agreement by participants to suspend reality in a certain manner and to act jointly in the pursuit of one goal. The authors found atypical characteristics in metacommunication, or communicating about communication, in all children with ASD who participated in the study. Children in the study were resistant to suggestions from outside the frame of play and had difficulty incorporating or adapting to other playmates' ideas or actions, which can be attributed to the social impairments characteristic of ASD (Douglas & Stirling, 2012). One longitudinal study found that children with ASD may be lacking a necessary and specific form of communication related to joint engagement, or the child's ability to actively attend to the shared object or the partner, rather than general communicative abilities (Hobson, Hobson, Cheung, & Caló, 2015). This finding was based on the result that the degree of the children's social-communicative disability was inversely related to their metarepresentational capabilities and was partially explained by measures of joint engagement (Hobson, Hobson, Cheung, & Caló, 2015). Communication difficulties do impact pretend play in children with ASD but also appear to be intertwined with joint attention, or the capability to share the experience of looking at an object or event with another person, which requires social interaction and understanding (Barton & Pavilanis, 2012).

Theories about Cognitive Underpinnings of Pretend Play Deficits

Children with ASD possess a limited ability to comprehend or perform pretend play acts that goes beyond cognitive delays. The pretend play differences of children with ASD are more than a simple nonexistence of playing pretend or delayed exhibition of pretend play until a later age. Many researchers have theorized why such deficits exist, typically in relation to either theory of mind (ToM) or executive functioning (EF) (Rutherford & Rogers, 2003). Theorists offer contrasting views as to whether the deficit in pretend play in children with ASD is due to social skill deficits, communication barriers, or cognitive limitations (Hobson, Lee, & Hobson, 2009). The difficulty in researching the differences in pretend play for children with ASD is that abnormalities are not restricted to a particular aspect of pretend play or the ability to produce pretend play at all (Hobson, Lee, & Hobson, 2009). Lacking a straightforward problem to study results in many differing answers regarding the root of pretend play impairments in children in ASD due to the complexity of the developmental mind and play habits (Hobson, Lee, & Hobson, 2009). Additionally, the cognitive functions that underpin the skills and thought processes necessary for pretend play are multi-faceted and complex themselves and are difficult to reduce to one single source. Many of the theories are also built on the foundation of another theory, building on or adapting the theory as new research provides evidence that refines, supports, or disproves the theory. This increases the possibility of many components of one current theory developing more than the creation of a new theory or discovery (Hobson, Lee, & Hobson, 2009). However, neuroscience and research into the anomalies of brains of people with autism is growing and increasing ever-constantly.

One explanation for limitations in pretend play in children with ASD is deficits in ToM, or the awareness of the brain's mental functions and the ability to predict and respond to another person's interpreted mental state (Rutherford & Rogers, 2003). The function within ToM that affects pretend play is metarepresentation, or the ability to separate an object from its primary identity and re-work it indefinitely as something with a different identity, such as a banana used as a phone (Rutherford & Rogers, 2003). The metarepresentation theory originated with Alan Leslie (1987) with the concept of decoupling, or the ability to make the primary function of an object separate from the object in order to think of the object in a pretend manner (Leslie, 1987). Pretend play, according to Leslie, requires the decoupling of a banana from its primary representation as a banana from that of its pretend representation of a telephone (Leslie, 1987). This decoupling allows a child to pretend without becoming confused about what is real and mixing the true primary functions of objects with the pretend representation. Decoupling underlies applying representations to objects that are absent, objects that usually mean something else, or objects that do not have the literal properties as described in play (Leslie, 1987). According to this theory, ToM development abnormalities signal a deficit in metarepresentation and present metarepresentation as key to pretend play discrepancies, and hold that children with ASD innately lack the decoupling mechanism. Children with ASD have also been known to display other ToM deficits in regards to attributing true and false beliefs to themselves and others (Rutherford & Rogers, 2003).

Conversely, findings from one study of 32 children discount theories of metarepresentation deficits as an explanation for a difference in pretend play in children with ASD (Hobson, Lee, & Hobson, 2009). Children with ASD displayed similar abilities to the

control group to metarepresent and demonstrate flexibility, which were categorized as the mechanics of play. There were differences in other measures of playful pretend in the study, children with ASD were less aware of themselves as creating meaning (e.g. "I can make this stand for that"), less generative, less emotionally expressive, lacked qualities of fun, and less motivated/engaged in symbolizing. However, there were significant increases in self-awareness and investment in symbolic meaning when the participating adult modeled aspects of playful pretend. The evidence of equal metarepresentational qualities in the play of both children with and without ASD acts as contradictory evidence to the above theory regarding ToM and claims that an inability to metarepresent is neither autism-specific nor is it the underlying process in pretend play. Rather the authors hypothesize the deficit is based in intersubjective engagement and social-cognitive development (Hobson, Lee, & Hobson, 2009). The disparity in the findings of research regarding the metarepresentational aptitudes of children with ASD presents a possible area of further study or attempts at replication (Rutherford & Rogers, 2003).

Another prominent model that attempts to explain the complex factors involved in pretend play, and therefore the root of any deficit, is the executive function theory. Executive functions (EF) are the management of cognitive processes. These processes include the ability to think ahead in a sequence of actions, one's working memory, the formation and start of goal-directed behavior, use of mental models and strategies, inhibitory control, generativity, and flexible control of attentional processes. The EF theory attributes discrepancies in pretend play evident in children with ASD to EF deficits. Pretend play requires three EF processes: inhibition (disengagement from reality), generativity (new

scenario creation), and set shifting (shifting attention from one interpretation of toys or objects to another) (Rutherford & Rogers, 2003).

A study comparing the pretend play of children with ASD, children with other developmental disorders, and typically developing children examined EF and ToM theories, to determine which, if either, of the two models is more predictive of pretend play performance (Rutherford & Rogers, 2003). The findings regarding children with ASD were consistent with other research results in that the children produced less pretend play and significantly less spontaneous play than the two control groups. The study found that the association between generativity and pretend play was much stronger than the association between generativity and sensorimotor play, which rules out simpler explanations for pretend play deficits. However, it does emphasize generativity as the most predictive aspect of spontaneous pretend play habits, though generativity can theoretically predict pretend play scores among a whole sample of children and not account for the pretend play deficit in children with ASD. The group of children with ASD showed no difference in set shifting and generativity scores, processes related to EF, but did show joint attention (triadic attention between the child, play partner, and object) deficits compared to both control groups, suggesting a possible causal relationship between ToM deficits and pretend play. Joint attention behaviors are considered directly reflective of a child's ability to metarepresent as well as a precursor to ToM mechanisms. There was no correlation found between the joint attention and EF measures, demonstrating a certain level of independence in the variables. The study also found no significant correlation between verbal mental age and pretend play, a surprising discovery given that language consists of a symbol system, though most of the children with ASD in this study were preverbal. The authors concluded that the atypical

cognitive development of children with ASD is both qualitative and quantitative since the control group demonstrated a high correlation between mental age measures and pretend play as indicators of development but this was lacking in children with autism and demonstrates the child's intelligence quotient alone is not a reliable predictor of pretend play. The lack of correlational relationships found in this study leaves the possibility open that pretend play has another cognitive precursor that is yet to be considered (Rutherford & Rogers, 2003).

According to Hobson, Lee, & Hobson (2009) the aforementioned theories about pretend play and children with ASD are not multiple different components but possibly aspects of one underlying social process that is the direct link to the pretend play deficit in children with ASD. Their research takes a social-developmental perspective. For example, the child's inability to take on other people's perspectives might contribute to or be the underlying reason for executive dysfunction among children with ASD. An inability to adopt a playmate's stance or given meaning through identifying with their attitudes may also limit a child's creative attributions to meaning, or making one thing stand for another, which correlates with research on pretense. Key elements on which symbolic play is said to rely are actually the same vital aspects needed for identifying with others socially. A study conducted by Hobson, Lee, & Hobson (2009) of 32 children found comparable results between the children with ASD and the control group as far as metarepresentation and flexibility but there was a lack of awareness of self, investment in symbolic meanings, creativity, and fun. These differences reflect social underpinnings of the deficits in pretend play in children with ASD. The pretend play behaviors were still manifested but the play lacked the social-developmental background key to other aspects of pretend play. These missing or limited aspects are nonessential to the pretend play act being generated but impact the quality of the

act itself. Pretend play can still occur as an understanding of "this represents that" while the child is lacking an awareness of self in relation to the creation of meanings, investment in the meanings, creativity and fun. This reveals that pretend play can still occur, albeit at a different level than that of children without ASD, but lacks elements such as creativity, fun, and awareness of self due to a social deficit rather than a metarepresentational one (Hobson, Lee, & Hobson, 2009).

Pretend Play as an Intervention

Pretend play is often used as an intervention for language and social skills for children with ASD, addressing many of the needs of this population. The social aspect of pretend play with a partner or group, which occurs more often than solitary imaginative play, results in increased social interactions for children with ASD through participation in pretend play activities. Additionally, language is a key component of pretend play as partners must communicate the context of the play and learn to respond to the actions and statements of their playmates in order to facilitate and sustain the pretense of the play act.

Benefits exist in the increase of play behavior itself. Facilitated play increases play behaviors that naturally improve learning, thinking, and creativity in children. One foundational study of three children with ASD found that play increased and maintained over time after being facilitated, rather than increasing and then returning to the same frequency of play prior to the study (Thorp, Stahmer, & Schreibman, 1995). A more recent study on reciprocal imitation, a naturalistic behavioral intervention, also found an increase in pretend play after the children participated in sessions practicing imitation with novel toys (Ingersoll & Schreibman, 2006). Two children with ASD also showed an increase in their spontaneous pretend play during the same study by Ingersoll & Schreibman (2006). A case study of five boys with ASD showed an increase in pretend play in all of the children after facilitation of pretend play during the study despite the children having never been seen engaging in pretend play previously at school (Sherratt, 2002). Pretend play behaviors have also been shown to promote less restrictive school placements for children with ASD because the child is able to engage independently with their environment and peers (Barton, 2010). Numerous studies have demonstrated similar results of increased pretend play in students with ASD

(Barton, 2010; Ingersoll & Schreibman, 2006; Lewis & Boucher, 1995; Thorp, Stahmer, & Schreibman, 1995; & Sherratt, 2002).

The social characteristics of pretend play make play an effective social skills intervention. Pretend play promotes peer interactions across natural contexts for children with ASD and also reduces stigmatization by peers for their disability (Barton, 2010). Children with and without ASD produced more novel meanings in their symbolic play when they played with another person, suggesting that the intervention is more effective as a social interaction rather than a solitary one (Hobson, Hobson, Cheung, & Caló, 2015). However, there are noted benefits to solitary pretend play as well and the age range for which playing alone and playing with others are most effective is a topic worthy of further study (Hobson, Hobson, Cheung, & Caló, 2015). Peers can play a pivotal role in developing social skills in children with ASD as they can consistently initiate contact with the child with ASD and role play appropriate behaviors, whereas there is typically reciprocal initiation of play between typically developing children (Mastrangelo, 2009). The benefits of modeling pretend play and the increased involvement and other aspects of pretend play shown in a study of 32 children also support pretend play as a social intervention as the play moved from mechanical to playful pretend (Hobson, Lee, & Hobson, 2009). Pretend play frequently contains themes involving typical social interactions that increase appropriate social behaviors, such as pretenses involving family roles, helping one another, manners, greetings, and holidays (Mastrangelo, 2009). Social cues and expected social roles are often difficult for children with ASD to discern or they lack the skills necessary to carry out social exchanges. Additional exposure to the social world and its expectations is helpful for the child acquiring an understanding of the frequently unspoken rules and expectations of society (Scattone,

2007). Pretend play facilitation led to more spontaneous and novel pretend play in children with ASD while improving peer relationships and appropriate social behaviors.

The restricted, repetitive interests and behaviors typical of students with ASD can be used to garner a greater use of pretend play through employing the child's circumscribed interests (CI) (Porter, 2012). One case study of a mother and her son with ASD focused on the child's fixation on trains and the mother's use of modeling with trains and open-ended divergent materials to promote pretend play in her child (Porter, 2012). The unique behavioral characteristics of children with ASD may actually enable such children to increase their use of pretend play if those behaviors can be involved during pretend play. The study utilized a concept web to determine all related play experiences based on the topic of trains and used divergent materials to model alternative uses that could be imagined (Porter, 2012). The mother also emphasized language during pretend play to model verbal interactions and then provided field trips and excursions to various locations to ride or observe trains and then recreated the experience using materials at home (Porter, 2012). The child increased his use of pretend play because of the involvement of trains, his circumscribed interest, and even generated his own scenarios and phrases. Involving a student's circumscribed interests may be a vital tool to increasing and comprehending pretend play for children with ASD, as it relies on the child's intrinsic motivation to interact with their CI. The social and language features of pretend play are often difficult for children with ASD and are factors that may be demotivating, while the CI counters the difficulty or unfamiliarity of pretend play with a highly desired interest. Many parents and professionals see the CI of children with ASD as limiting or interfering but this case study demonstrated that the CI can be used to encourage

and increase the frequency of pretend play, which in turn increases the child's language use, desired behavior, and social exposure.

Pretend play development often occurs simultaneously with the rapid increase of language development in typically developing children (Barton, 2010). It is logical to pair pretend play and language as an intervention that addresses both deficits in language and play. Playful pretend acts often involve the construction of verbal narratives, requiring forethought and well-developed language skills (Rutherford & Rogers, 2003). In one longitudinal study of forms of joint engagement by children with ASD and Down syndrome, authors found that pretend play facilitation may provide a healthy context for early language learning (Adamson, Bakeman, Deckner, & Romski, 2009). Bloom and Tinker (2001) found in a separate longitudinal study that language is not an independent element of play and is acquired more easily in contexts such as that of object play, in which the object can scaffold the relevant language and applicable vocabulary in the play act. Such studies support pretend play acts as language aids because they provide the context in which language can be understood and supported.

When pretend play was facilitated using reciprocal imitation training, a naturalistic behavioral intervention, language was further found to increase both in imitative forms and spontaneously when compared to language use prior to the study. Not only did language use increase in a general manner, the use of appropriate language also increased (Ingersoll & Schreibman, 2006). Communication skills found in pretend play in both expressive and receptive forms are expressing needs, using gestures, joint attention, the use of visual information to communicate, and using words to communicate (Mastrangelo, 2009). Children participating in pretend play learn to name objects, expand their vocabulary, and

use more descriptive language. Children also learn how to link objects and actions, which helps them link concepts and form sentences or phrases (Mastrangelo, 2009). These skills are not exclusively learned through pretend play but pretend play can facilitate the practice and acquisition of these skills since development of pretend play is often paired with dramatic increases in language use and vocabulary (Barton, 2010). The language use in play also develops and transforms as the child does, beginning with talking to themselves in the early stages of pretend play to later using varying forms of discourse, such as explaining, clarifying, negotiating, and questioning (Bernard-Opitz, 2007).

There are difficulties in teaching or facilitating pretend play, as the child with ASD may not be developmentally ready to pretend (Kasari, Chang, & Patterson, 2013). Most researchers view pretend play as a hierarchy of prerequisite skills building from functional play to pretend play (Kasari, Chang, & Patterson, 2013). Therefore, it is logical and beneficial to the child to begin teaching functional play skills prior to targeting instruction on symbolic acts (Kasari, Chang, & Patterson, 2013). Capitalizing on a child's restricted or circumscribed interests in a positive way may aid the facilitator in motivating the child with ASD to engage in pretend play and such interests can be utilized as a tool for a pretend play intervention (Porter, 2012; Timmins, 2014). Strategies such as using circumscribed interests provide an ASD-specific means of reaching children with ASD when addressing pretend play impairments. Some authors state that another key aspect of pretend play facilitation is that the play remains child-directed and flexible; otherwise the child with ASD may be learning to simply imitate desired play behaviors rather than acquiring the skills needed to engage in pretend play (Barton & Pavilanis, 2012).

Facilitating and Teaching Pretend Play

Pretend play can have a significant impact as a language, social, and/or behavior intervention, especially when implemented in a school or other educational environment. There are many different ways to implement pretend play as a classroom or home intervention, with various manners of facilitating the intervention. The intervention can be facilitated through technology or modeling with peers, adults, or siblings and may utilize scripts, toys, or visual imagery. The utilization or combination of factors results in a variety of options for teachers, paraprofessionals, therapists, and teachers to use with a child with ASD.

A prevalent form of teaching and facilitating pretend play is video modeling. A study by Boudreau and De'Entremont (2010) examined the efficacy of using video modeling to facilitate pretend play in two four-year-old boys diagnosed with ASD. The study used a video model of an adult playing with a toy set and then presented the child with the same toy set after viewing the video (Boudreau & D'Entremont, 2010). Later sessions included reinforcement for imitating the modeled play skills and the introduction of novel toys during the generalization phase (Boudreau & D'Entremont, 2010). Both children showed increases in scripted verbalizations and modeled actions, demonstrating the effectiveness of video modeling for acquisition of greater motor actions and verbal responses in preschoolers (Boudreau & D'Entremont, 2010). The frequency of these behaviors increased with reinforcement sessions but there was also a reduction in novel play after reinforcement, as the video modeling phase made the participants less flexible and rigidly committed to the model and the order in which it was demonstrated and reinforced (Boudreau & D'Entremont, 2010). However, the generalization phase of the study, in which the same video models were

shown but new toys were introduced, showed increased levels of novel responses, particularly in relation to toy generalization (Boudreau & D'Entremont, 2010). The authors attribute the increase in spontaneous response to the unexpected introduction of unfamiliar toys after viewing the video model during the generalization phase of the study (Boudreau & D'Entremont, 2010). Long-term maintenance was only found in one child, though both children demonstrated generalization and short-term maintenance of the behaviors, consistent with findings of other studies about video modeling (Boudreau & D'Entremont, 2010). Video modeling still resulted in an overall higher frequency of play skills and pretend play acts, despite decreasing after the removal of the video component (Boudreau & D'Entremont, 2010). Results of a parent satisfaction survey at the conclusion of the study reported that parents felt video modeling had been beneficial and they would recommend this type of intervention to others (Boudreau & D'Entremont, 2010). The rapid increase in skills was supported by another study of two preschool-age children with ASD by Macdonald, Clark, Garrigan, & Vangala (2005). This study also found rapid acquisition of scripted play verbalizations and actions after utilizing a video model with multiple play scenarios modeled by adults (Macdonald, Clark, Garrigan, & Vangala, 2005). These studies involving video modeling reveal evidence of its effectiveness in increasing scripted behaviors, however, participants would likely benefit from a combination of this intervention and other strategies to produce more novel and generative play.

The role and relation of the models used in video modeling has also been an area of study, particularly whether peer models are more or less effective than adult models. One study by Sani-Bozkurt and Ozen (2015) examined the effectiveness and efficiency of both peer and adult models in video models used to teach pretend play skills to children with ASD

and found no significant difference between the models. An adapted alternating treatments design was used for the three participants of this study and all three children acquired target skills through both types of teaching procedures. Parents expressed positive views of both model types as well. The authors also demonstrated permanence of the skills acquired by the participants when different people and materials were shown across different environments (Sani-Bozkurt & Ozen, 2015). There may be a difference when the video modeling includes a sibling as the model and play partner according to a study of one child by Reagon, Higbee, and Endicott (2006). Intervention data in this study as well as parent and sibling survey questions indicated an increased benefit from sibling-oriented interventions, particularly since the sibling could act as both the model and continued play partner for the child with ASD. Further potential benefits of teaching siblings of children with ASD to serve as video models include ready availability, parental support, and increased chances of play skills generalizing at home, all of which are significant (Reagon, Higbee, & Endicott, 2006).

The portability of modern technology also allows this type of video modeling to be implemented and recorded at both home and school, which may help the child generalize the pretend play behaviors. Professionals and parents may also collaborate more easily across home and school settings due to the portability, accessibility, and affordability of digital video technology that is the result of recent technological advances. Video modeling is both time and cost efficient as compared to traditional methods of facilitating and teaching pretend play. Additionally, technology offers the unique feature of simple systematic repetition, allowing for the video to be watched or references as many times as needed (Reagon, Higbee, & Endicott, 2006).

Studies have also compared video modeling with another type of intervention, such as least-to-most prompting or pivotal response training, to determine the comparative effectiveness of each in increasing pretend play in children with ASD (Lydon, Healy, and Leader, 2011; Ulke-Kurkcuoglu, 2015). In a study of three subjects with ASD, Ulke-Kurkcuoglu (2015) compared instruction through video modeling to least-to-most (LTM) prompting, or presentation of the least restrictive prompt and increasing intensity as needed up to the most restrictive prompt. Least-to-most prompting is effective in supporting playing alone and independent responses. LTM prompting can be embedded in adult-child interactions, and the use of prompts based on the play interactions can motivate the child to generate new play behaviors. The study found no difference in the effectiveness, maintenance, or generalization results between the two methods. The author did find that LTM prompting was more efficient in comparison to video modeling, but LTM prompting also had a slightly higher number of incorrect responses during the intervention sessions. The methods had similar results, and the author did not consider the efficiency difference sufficient enough to recommend either method over the other (Ulke-Kurkcuoglu, 2015).

A study by Lydon, Healy, and Leader (2011) compares video modeling to pivotal response training (PRT), a method that allows the child to choose the activity and all correct responses or appropriate attempts by the child are systematically reinforced. Both video modeling and PRT were found to similarly increase the number of pretend play actions and pretend play skills of the five participants and neither method yielded a significant increase in play verbalizations. PRT had more pretend play actions and PRT had a significantly greater number of play actions overall during the generalization phase when compared to video

modeling, supporting other findings that PRT increases motivation and enhances generalization of skills over time (Lydon, Healy, and Leader, 2011).

Generalization of newly acquired pretend play skills and behaviors is a necessary goal of facilitating pretend play, as the child maintains the learned skills and is able to demonstrate them across environments. Measurements of generalization are often lacking across pretend play research. Therefore, Barton (2015) designed a study that focused on the generalization aspect of pretend play interventions as well as the use of pretend play context to teach other related play behaviors. Barton used an intervention combination consisting of the system of least prompts and contingent imitation with four children, three of whom were diagnosed with ASD, in a classroom context. All four children generalized pretend play to nonintervention contexts across behaviors, materials, adults, and settings. Each child generalized the unstructured free-play to his or her classroom, which is significant in the child maintaining those behaviors in a natural environment and promoting peer interactions. All four children also maintained levels of pretend play without teacher prompts beyond the intervention, indicating lasting changes in the children's pretend play skills and an important opportunity for independence for children with ASD. Play also allows for children's individualized goals to be embedded in play instruction and play interactions, as the practitioners consider each child's play skills. This supports widespread research on the importance of embedded and individualized instruction along with explicit instruction for children with ASD (Barton, 2015).

Conclusion and Discussion

Children with ASD consistently display difficulties or differences in pretend play behaviors, particularly regarding novel ideas and joint attention; however, each of the mentioned studies differed in their manner of testing and the elements tested, yielding a wide variety of results on different aspects of the relationship between pretend play and children with ASD. Pretend play is often practiced less frequently by children with ASD than children without an ASD diagnosis and is more limited in its characteristics and play developments. Pretend play differences found in these studies include pretense, awareness of self, symbolic meaning, creativity, fun, generativity, communication, social identification, joint attention, emotional expression, and engagement. The play partner also varied widely among studies, whether it was a parent, known adult, researcher, sibling, or peer. The variations in play partner may impact results, as most children likely play differently with their peers than with a research assistant. The manner in which the pretend play occurred during the study also differed. Researchers prompted some children, others modeled pretend play acts during testing, some gave direct instruction, and pretend play was loosely facilitated by a partner in other scenarios.

Regardless of the differences in how the research on pretend play has been conducted, pretend play deficits remain a hallmark characteristic of ASD and is an important intervention tool for the same population. Social benefits when pretend play is facilitated include increased interactions with peers and more appropriate social behaviors. Language also increases in frequency and appropriateness during pretend play acts and maintains after play ends. Imaginative acts provide a context in which language is more easily understood

and foster vocabulary and usage increases. These benefits indicate that pretend play is a worthwhile intervention and should be implemented frequently with children with ASD.

Pretend play facilitation in most environments leads to an increase in pretend play in the classroom, but even more so if it is intentionally facilitated in a school setting. Pretend play can easily be integrated into a school environment if the classroom teacher or assistant is intentional about cultivating a creatively stimulating environment, peer relationships, and support for the student to benefit from playing pretend. Pretend play in a school setting leads to natural increases in existing peer interaction and improves the likelihood of a less restrictive placement for the child with ASD, because the child is able to engage independently with their environment and peers. Maintenance of pretend play skills beyond prompting also indicates an important opportunity for independence and confidence building for children with ASD**.** All environments should be considered when trying to increase the facilitation of pretend play for a child with ASD.

Multiple means of effective pretend play facilitation are found in this research, which is meaningful for educators, parents, and professionals as it provides flexibility in the approach and allows for the facilitator to utilize the method that is the best fit for their individual children and environment. Video modeling is researched more widely than comparable techniques and this allows for video modeling to be a base measure of facilitation against which other means can be compared for effectiveness, maintenance, and generalization. A sibling is the most effective model for video modeling, though both peer and adults were found to be similarly beneficial and still demonstrated permanence of skills when generalized. The use of a sibling as the model reinforces family involvement in

maintenance and generalization, but may also place stress or responsibility on the sibling involved, though this was not a factor addressed in the study.

The studies involving video modeling reveal evidence of its effectiveness in increasing scripted behaviors and the efficiency of portability; however, participants would likely benefit from a combination of this intervention and other strategies to produce more novel and generative play. LTM prompting is slightly more efficient than video modeling but also had slightly higher number of incorrect responses during intervention sessions. Therefore, LTM could be used in combination with video modeling to increase solitary play and independent responses in addition to the benefits of video modeling. PRT and video modeling similarly increase the number of pretend play actions and pretend play skills but PRT had significantly greater number of play actions overall during the generalization phase. The importance of generalization in pretend play facilitation is essential, so PRT may be a key element to embed in pretend play facilitation to increase the extension of pretend play to nonintervention contexts across behaviors, materials, adults, and settings. Facilitators should consider the toys, environments, and scripts they employ in pretend play facilitation carefully as they should be both high interest and high engagement for the child but also effectively transfer to other environments.

There are certain limitations to the research cited on the role of pretend play in children with ASD. One such limitation to the research is the validity of defining what qualifies as pretend play behavior. A research analyst can't determine definitively what a child is thinking and if the child is truly pretending versus simply imitating a previously witnessed play scenario or behavior. An individual can only infer the pretense of the action based on the action itself, which may or may not be an act where the child is really

pretending. All of the studies did develop criteria to determine what qualified as pretend play, but there were discrepancies among them that make comparisons of data and results more difficult. Differences in criteria also makes replication of studies much more difficult (Barton, 2010). This does not invalidate the studies themselves but increases the difficulty and care required in comparing or synthesizing previous findings on pretend play.

Matching of children with ASD with control or comparison groups is challenging due to the complex factors involved. Some studies matched the children according to cognitive functioning, others language ability, and others mental or biological age. This factor is a consistent issue in research of children with ASD because it is difficult to discern the appropriate manner of matching group levels. Results in studies on pretend play frequency or pretense when the control group is matched based on communicative ability versus mental age could be significantly different. The control group can greatly impact the results of research and thus the scaling factor to determine the control group and match them with the group of children with ASD is vital to obtaining accurate results.

Many of the studies were also single-subject or only had a few participants, which should raise caution when generalizing results to the whole population of children with ASD. However, ASD manifests differently in every child, so results are rarely universally applicable in this field. Rather, the methods and evidence of these studies indicate common patterns found among children with ASD and effective interventions for small groups of children that may be relevant and useful for many other children with ASD. The findings are also important for further research as well as building on the current understanding of ASD.

Furthermore, some aspects of pretend play are subjective and the interpretation of such aspects may differ according to the researcher. One study identified “fun” as a category

that was scaled as a feature of pretend play while the lack of a definition of "fun" in a research environment may affect the validity of the study (Hobson, Lee, & Hobson, 2009). Another limitation could be the characteristics of the child being accounted for as pretend play aspects or limitations when the child is potentially shy or inexpressive by nature (Hobson, Lee, & Hobson, 2009). This difference could account for a few of the children's results but would not account for differences in creativity or engagement (Hobson, Lee, & Hobson, 2009).

Learned helplessness in a child with ASD can be another inhibitor of pretend play and the research surrounding it if the child has had negative experiences with pretend play. Learned helplessness is achieved when the individual views aversive events as being out of their control and results in the individual being unable or unwilling to avoid encounters with negative stimulus (Mastrangelo, 2009). Learned helplessness can further exacerbate a problem in behavior or pretend play because the child can develop low confidence in their abilities and lose motivation to learn or try to use their imagination (Mastrangelo, 2009). A child experiencing learned helplessness must struggle between their intrinsic motivation to play and their inability to access play (Mastrangelo, 2009). A facilitator who suspects a child with ASD is experiencing the effects of learned helplessness should keep the tension it creates for the child in mind when calculating results or setting up the design of the pretend play scenario to limit its effects.

Future studies should examine the benefits and drawbacks of solitary play, as almost all of the research in this review involved play with an adult or peer partner. Solitary play has had little study due to the social isolationism that often occurs in children with ASD but learning to imagine and play alone could have a positive impact in the child's life and

independence, particularly if the child does not have siblings. The studies reviewed did show positive results with a partner in regards to increases in appropriate social behaviors. However, it would be intriguing to compare the two types of play, particularly as the understandings of the characteristics of ASD and its possible causes increase.

An additional topic of research in future studies is a universal scale for pretend play behaviors. The multitude of different standards for measuring pretend play behaviors made synthesizing research difficult and also left inconsistencies as to what qualifies as pretend play. Pretend play scales do exist but they are not widely used nor were they consistently found as an analytical tool in the studies used in this review. A study or synthesis of current studies that could identify the full scale of standard and nonstandard features of imaginative play would provide helpful direction for this field and a base upon which all further studies can build.

In conclusion, the role of pretend play in the lives of children with ASD was examined through reviewing the research and the most recent studies on pretend play. A clear difference in frequency, complexity, and quality of pretend play exists for children with ASD as they exhibit pretend acts in a simpler, more restricted manner and less often than children without a diagnosis of ASD. However, research showed that direct instruction or facilitation of pretend play has positive effects on children and repeatedly results in an increase in pretend play behaviors. An increase in pretend play also acts as a social and language intervention, as both communication and social skills are involved in pretend play with a partner or group. Research showed positive impact on social behaviors regarding improved appropriateness, peer interactions, and more novel play. Language benefits were found when pretend play and communication were related to increased speech, more

appropriate speech, an understandable context, and expressive and receptive language improvements. Multiple methods of pretend play facilitation are effective in both classroom and home enviroments, including video modeling, PRT, and LTM prompting; all of which can be utilized in combination and contain embedded goals for language, social skills, and functional skills. Pretend play should be facilitated in multiple environments and used as an effective intervention because the differences in pretend play can be mediated through peers, modeling, and facilitation of imaginative play with the ultimate goal of generalization and improved quality of life.

References

Adamson, L. B., Bakeman, R., Deckner, D. F., & Romski, M. (2009). Joint engagement and the emergence of language in children with autism and down syndrome. *Journal of Autism and Developmental Disorders, 39*(1), 84-96. doi:10.1007/s10803-008-0601-7

American Psychiatric Association., & American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders: DSM-5.*

Barton, E. E. (2010). Development of a taxonomy of pretend play for children with disabilities. *Infants & Young Children, 23*(4), 247-261. doi:10.1097/IYC.0b013e3181f22072

Barton, E. E. (2015). Teaching generalized pretend play and related behaviors to young children with disabilities. *Exceptional Children, 81*(4), 489-506. doi:10.1177/0014402914563694

Barton, E. E., & Pavilanis, R. (2012). Teaching pretend play to young children with autism. *Young Exceptional Children, 15*(1), 5-17. doi:10.1177/1096250611424106

Bernard-Opitz, V. (2007). *Children with autism spectrum disorders: A structured teaching and experience-based program for therapists, teachers, and parents*. Austin, TX: PRO-ED.

Bloom, L., & Tinker, E. (2001). The intentionality model and language acquisition: Engagement, effort, and the essential tension in development [Abstract]. *Monographs of the Society for Research in Child Development, 66*.

Boudreau, E., & D'Entremont, B. (2010). Improving the pretend play skills of preschoolers with autism spectrum disorders: The effects of video modeling. *Journal of Developmental and Physical Disabilities J Dev Phys Disabil, 22*(4), 415-431. doi:10.1007/s10882-010-9201-5

Douglas, S., & Stirling, L. (2012). Metacommunication, social pretend play and children with autism. *Australasian Journal of Early Childhood, 37*(4), 34-43.

Hobson, J. A., Hobson, R. P., Cheung, Y., & Caló, S. (2014). Symbolizing as interpersonally grounded shifts in meaning: Social play in children with and without autism. *Journal of Autism and Developmental Disorders, 45*(1), 42-52. doi:10.1007/s10803-014-2122-x

Hobson, R. P., Lee, A., & Hobson, J. A. (2009). Qualities of symbolic play among children with autism: A social-developmental perspective. *Journal of Autism and Developmental Disorders, 39*(1), 12-22. doi:10.1007/s10803-008-0589-z

Ingersoll, B., & Schreibman, L. (2006). Teaching reciprocal imitation skills to young children with autism using a naturalistic behavioral approach: Effects on language, pretend play, and joint attention. *Journal of Autism and Developmental Disorders, 36*(4), 487-505. doi:10.1007/s10803-006-0089-y

Kasari, C., Chang, Y., & Patterson, S. (2013). Pretending to play or playing to pretend: The case of autism. *American Journal of Play, 6*(1).

Leslie, A. M. (1987). Pretense and representation: The origins of "theory of mind." *Psychological Review, 94*(4), 412-426. doi:10.1037//0033-295X.94.4.412

Lewis, V., & Boucher, J. (1995). Generativity in the play of young people with autism. *Journal of Autism and Developmental Disorders, 25*(2), 105-121. doi:10.1007/BF02178499

Low, J., Goddard, E., & Melser, J. (2009). Generativity and imagination in autism spectrum disorder: Evidence from individual differences in children's impossible entity

drawings. *British Journal of Developmental Psychology, 27*(2), 425-444. doi:10.1348/026151008X334728

Lydon, H., Healy, O., & Leader, G. (2011). A comparison of video modeling and pivotal response training to teach pretend play skills to children with autism spectrum disorder. *Research in Autism Spectrum Disorders, 5*(2), 872-884. doi:10.1016/j.rasd.2010.10.002

Macdonald, R., Clark, M., Garrigan, E., & Vangala, M. (2005). Using video modeling to teach pretend play to children with autism. *Behavioral Interventions, 20*(4), 225-238. doi:10.1002/bin.197

Mastrangelo, S. (2009). Harnessing the power of play: Opportunities for children with autism spectrum disorders. *Teaching Exceptional Children, 42*(1), 34-44.

Matson, J. L., & Nebel-Schwalm, M. S. (2007). Comorbid psychopathology with autism spectrum disorder in children: An overview. *Research in Developmental Disabilities, 28*(4), 341-352. doi:10.1016/j.ridd.2005.12.004

Nicolich, L. (1977). Beyond sensorimotor intelligence: Assessment of symbolic maturity through analysis of pretend play. *Merrill-Palmer Quarterly, 23*(2), 89-99.

Porter, N. (2012). Promotion of pretend play for children with high-functioning autism through the use of circumscribed interests. *Early Childhood Education Journal, 40*(3), 161-167. doi:10.1007/s10643-012-0505-1

Reagon, K. A., Higbee, T. S., & Endicott, K. (2006). Teaching pretend play skills to a student with autism using video modeling with a sibling as model and play partner. *Education and Treatment of Children, 29*(3), 517-528.

Rellini, E., Tortolani, D., Trillo, S., Carbone, S., & Montecchi, F. (2004). Childhood autism rating scale (CARS) and autism behavior checklist (ABC) correspondence and conflicts with DSM-IV criteria in diagnosis of autism. *Journal of Autism and Developmental Disorders, 34*(6), 703-708. doi:10.1007/s10803-004-5290-2

Rutherford, M. D., & Rogers, S. J. (2003). Cognitive underpinnings of pretend play in autism. *Journal of Autism and Developmental Disorders, 33*(3).

Sani-Bozkurt, S., & Ozen, A. (2015). Effectiveness and efficiency of peer and adult models used in video modeling in teaching pretend play skills to children with autism spectrum disorder. *Education and Training in Autism and Developmental Disabilities, 50*(1), 71-83.

Scattone, D. (2007). Social skills interventions for children with autism. *Psychology in the Schools, 44*(7), 717-726. doi:10.1002/pits.20260

Sherratt, D. (2002). Developing pretend play in children with autism: A case study. *Autism, 6*(2), 169-179. doi:10.1177/1362361302006002004

Thorp, D. M., Stahmer, A. C., & Schreibman, L. (1995). Effects of sociodramatic play training on children with autism. *Journal of Autism and Developmental Disorders, 25*(3), 265-282. doi:10.1007/BF02179288

Timmins, J. (2014). An intervention that uses circumscribed interests to promote pretend play and social interaction in a preschool pupil with autism spectrum disorder. *Journal of Special Education Needs in Ireland, 27*(2).

Ulke-Kurkcuoglu, B. (2015). A comparison of least-to-most prompting and video modeling for teaching pretend play skills to children with autism spectrum disorder. *ESTP Educational Sciences: Theory & Practice, 15*(2). doi:10.12738/estp.2015.2.2541

Vivanti, G., Hudry, K., Trembath, D., Barbaro, J., Richdale, A., & Dissanayake, C. (2013). Towards the DSM-5 criteria for autism: Clinical, cultural, and research implications. *Australian Psychologist, 48*, 258-261. doi:10.1111/ap.12008

Wing, L., Gould, J., Yeates, S. R., & Brierly, L. M. (1977). Symbolic play in severely mentally retarded and in autistic children. *Journal of Child Psychology and Psychiatry, 18*(2), 167-178. doi:10.1111/j.1469-7610.1977.tb00426.x