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A Literature Review: How Language Parameter Deficits Impact Social Interaction in Children with Autism Spectrum Disorders during Middle Childhood, and Intervention Strategies

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ABSTRACT

Human growth is dependent upon social interactions, notably essential during the middle childhood years (ages 5-10). Although some children develop differently than others, all experience the same types of mental processes through which, due to a variety of factors, they may become typically achieving, or stunted in their development. Language is a key component of being human. Communication occurs through verbal and nonverbal behavior. People are able to understand what others are trying to encode through multiple processes of interpretation. Humans learn to use language through interaction with others, but are born with the ability to acquire language. Children with Autism spectrum disorders (ASD) acquire language the same way as typically developing children, however, they use a different system of communication. This paper will describe the difficulties in language usage in social situations faced by children with Autism, and will discuss how cognitive development and language acquisition shape the ways in which social interaction differs in typically developing children as compared to children with Autism in middle childhood. It will also illustrate multiple factors that may contribute to the deficiencies noted in ASD and what is being done to address those issues.

INTRODUCTION

Social interaction is thought of as a reciprocal process in which children can begin and continue to stay in relationships (Shores, 1987). It also includes face-to-face linguistic communication, though the reciprocal exchange between the persons involved does not have to be verbal. This type of interaction also features nonverbal behaviors, such as gestures and eye-gaze, which can sometimes serve as more effective modes of communication. In order to be socially understood one must be able to encode one's thoughts well enough for the intended receiver to understand the desired message. Since effective communication implies a shared social structure, it is easily attainable when the parties involved have commonalities (Rapport, 1993). Impairments in effective communication are, therefore, usually present because of cognitive deficiencies, such as Autism Spectrum Disorders.

Autism Spectrum Disorder (ASD) defines a variety of atypical developmental characteristics, yet each child is atypical within this population. ASD comprises a multitude of independent disorders, which include Autistic Disorder (AD), Asperger's Syndrome, Rett Disorder, Pervasive Developmental Disorder-Not Otherwise Specified (PDD-NOS), and Childhood Disintegrative Disorder (Turkington & Anan, 2007). In short, Autism is a neurodevelopmental impairment, described as a group of related symptoms that are characterized through unusual behavioral patterns and an individual's inability to effectively communicate or interact customarily with others (Hart & Whalon, 2011). Persons with ASD not only have difficulty using and understanding the verbal aspects of language, but they also exhibit an inability to interpret nonverbal cues. Their capacity to notice emotional differences is extremely limited. For example, forming relationships is often difficult for children with Autism; their social skills are noticeably deficient. Thus, peers tend to avoid them (Hart & Whalon, 2011). The studies examined in this paper focus on the many different social and communicative deficits noted in children with ASD. Findings suggest that even with a wide range of severities and deficits, improvements in social interaction and communication are attainable with quality intervention.

Development in Middle Childhood

Middle childhood (ages 5-10) is characterized by the "acquisition and mastery of skills valued by their culture, the development of social competence with peers, and the establishment of stable representations of self, particularly as these pertain to socially valued competencies" (Isabella & Diener, 2010, pg. 315). In order to become successful in social situations (i.e. relationships, careers, academics, etc.) children must gain positive images about themselves and be able to make connections with others by manipulating these perceptions in a positive way.

Peer interaction is a large part of middle childhood development. During this stage, children are given more opportunities to learn outside of the home environment and unravel new information about the surrounding world. According to Erik Erikson, children in this age group begin to form ideas about who they are. They become more aware of their strengths, weaknesses, abilities and values (Garcia Coll & Szalacha, 2004). Although children's development is greatly shaped by family influences, it is also dependent upon the institutions in which they are involved. During middle childhood, their minds are open to influences beyond the family and to suggestions about the future, such as who they may become as adults. The institutions in which a child interacts provide a multitude of people with different personalities, motives, and ideas, offering children ways to effectively interact in multiple settings. It is not until adolescence, however, that they decide who they want to be and what components of their past they will carry into the future. As with everything else in life, environments can have both positive and negative effects on a person. In middle childhood it is essential that the greatest amount of positivity be presented to all children.

Middle Childhood Play

Play, children's voluntary, organized activities, is a critical component of middle childhood. Environments such as schools provide them with opportunities for supervised play with their peers. "Play supports...children's social, emotional, physical, and cognitive development" (Bergen & Fromberg, 2009, pg. 426).

As children develop, so does their play. Play processes change through middle childhood; props become smaller, play-time is longer, language is not as simple, themes begin to make more sense and physical capabilities become more advanced. During play, children experience opportunities to develop confidence. Because play is first of all self-organized, it gives children the foundation to be independent, which sequentially provides self-satisfaction in their personal abilities, and confidence in their social interaction. As children grow, rules dominate play, and games with strict rules take the place of pure fantasy. Previous independence must give way to interdependence in order for a child to be thought of as a play-mate and/or friend (Bergen & Fromberg, 2009).

The importance of peer socialization becomes evident during play; if a child is not the play initiator, s/he must have the negotiation skills to be able to ease into the group in which the play is taking place. Typically developing children are usually able to pick up the skills for social interaction at an early age through observation, trial and error. Children who are self-confident have the skills needed to enter into play with others; children who are "loners" generally lack the confidence necessary to be invited to engage in peer play. At first glance, children's group activities do not seem to foster the social skills that will be utilized in adulthood. In actuality, however, play is essential to the successful maturation of children and somewhat predicts how they will interact socially in the future. Children with Autism tend to display some behaviors of those children who may be typically developing, yet they lack the ability to read the social cues that are essential in play.

A question of whether or not an intervention package can be successful in the growth of social skills and the reduction of repetitive behavior was addressed in a study conducted by Loftin et. al (2008). The intervention package consisted of peer training, social initiation training, and self-monitoring. Three students with Autism, Stuart, Anthony, and William, participated in this study; each was paired with a typically developing peer. These subjects exhibited similar repetitive motor behaviors with varying levels of severity. Data were collected on the boys during lunch, as it is

a time of day notable in its high levels of peer interaction. Stuart, Anthony, and William were taught how to record the number of times they initiated social engagement by using a golfer's wrist counter. For every social initiation, each boy would award himself with one point. Once a certain number of points was reached, a reinforcer specific to the individual interest of each boy was given by the intervention instructor. As the children with Autism became better equipped with the means to keep track of and control their behavior, rewards were decreased. Findings suggest that the natural reinforcer (peer socialization) was more rewarding than the use of tactile objects. In fact, Stuart, Anthony, and William began refusing concrete reinforcers toward the interventions' end, while they continued initiating socialization among their peers with greater frequency. Additionally, the instances of disruptive and repetitive behaviors decreased, while positive outcomes through peer interaction and self-awareness increased.

In an additional study, self-management skills aimed at implementing social communication were taught to four boys (aged 6, 11, 11, and 11) with Autism. Koegel, et. al., (1992) questioned whether or not disruptive behavioral patterns would decrease because of continued success in social communication. All of the boys were characterized as displaying disruptive-like behavior and/or being unresponsive to verbal initiations. Throughout the study, the communicative partner (i.e. clinician, parent, teacher, etc.) would ask questions with low variability which pertained to each child's particular interests. These were polar ("yes" or "no"), age appropriate questions; the subjects needed to either answer them correctly or attempt a response. At first, the communicative partner would record the number of appropriate responses from the student on his wrist counter. As the boys became comfortable with the treatment proceedings, they began keeping track of their own correct responses without assistance from the communicative partner. With every appropriate response, one point was awarded, followed by a reward if the point threshold was reached. This intervention sought to promote social communication through learned verbal responses. As the treatment progressed in difficulty, so did the boys' amount of communication.

Koegel et. al found that social responsivity can be successfully treated and easily monitored through this self-management strategy. The study demonstrated that self-management is an effective tool in implementing and/or improving social and communicative skills, while decreasing disruptive behavior in children with ASD.

Communication and Cognition

Communicative intents rely on language, but more importantly, facial expressions, gestures and eye gaze. This is true because unconscious brain activity controls more of what humans do than the conscious brain (Frith, 2009). In most instances, nonverbal forms of communication are used without any conscious thought. They become automatic through the process of language acquisition. This unconscious cognitive activity may explain why humans are able to communicate with their caregivers as early as four weeks old (Arnold, 2000). As infants, humans engage in reciprocal eye contact, suggesting that although they cannot verbalize their thoughts, they do have the desire to interact with others. Eye gaze is an extension of eye contact, differing only in its ability to locate the desired target through visual attraction. This skill allows the receiver to decode the intended message from the sender solely through the direction of gaze (Frith, 2009). In children with Autism, however, the ability to gain the receivers' attention in this way is disturbed due to the complex neuro-developmental deficits that describe the disorder.

In addition to eye gaze, gestural commands can serve as a fluent form of communication, perhaps being the most efficient way for the messenger to express his thoughts; gestures are used in the same context as eye gazing. The difference lies in that gestural commands are more structured in detailing what is desired by the messenger. For example, gestures can be used to point out an object or to illustrate the characteristics of something (e.g. a person could stretch his arms out to indicate that an object is wide). Perhaps the most unconscious of these common forms of nonverbal communication is the use of facial expressions. Humans unconsciously depict emotions on their faces (Frith, 2009). Because of this use of mirror neurons, humans have the ability

to engage others in personal emotional experiences even if the receiver is not sharing the same emotions. Frith (2009) gives an example of this in his citation of Ohman & Soares, (1998); an onlooker might become fearful when he observes a human face different from his own expressing fear. In this way, facial expressions, along with eye gaze and gestural commands, serve as effective forms of social interaction.

Cognitive development is "the process by which basic biological capabilities are shaped in ways that fit with the social and cultural context in which these capabilities will be used" (Gauvain, 2001, pg. 126). Cognitive development is evidenced by a multitude of influences that shape the world and its components. Furthermore, Vygotsky (1978) noted that cultural tools are the central means through which human action evolves, thus supporting the notion that the environment plays a strong role in the ways that we gradually increase our cognitive capacities. Environmental influences are not just those in which a person lives or regularly interacts. According to the Ecologist Theory, they also include commonly held ideas about virtually every aspect of life, such as what kinds of words are used in which situations. Thus, they are indicators of the child's environment, which shape his way of thinking, using language, and behaving.

Language Parameters in Language Acquisition

Semantics, phonology, syntax and *pragmatics* are the four basic parameters of language; they allow humans to express their thoughts and ideas. Efficacious communication is possible because of cognitive competency in the four basic parameters, which allow cogent verbal and nonverbal communication. In individuals with ASD, those language parameter impairments result in a child's inability to sufficiently communicate.

Semantics

Semantics refers to a word's meaning. In many cases, the meanings of words differ, based upon the context in which they are used. At an early age, children are able to understand that the same word can have different meanings, and they are able to use

the correct form for their desired message. In order for semantics to be effective, word meanings must be commonly understood by anyone who speaks the language in question (Woodfield, 1991). Approximately 25% of children with ASD do not develop spoken language (Prescott, 2010). Although verbal children with ASD are adept in relating words to concepts, they tend to confuse words and/or phrases through the usage of neologisms and imitation of the initiator. The distortion of language symbols, common in Autism, account for the semantic impairments related to the disorder.

The use of the Picture Exchange Communication System (PECS) was demonstrated to be an effective intervention for language development in children with Autism. Its purpose is to teach spontaneous elicitation of communication to children with language delays. Charman et. al. (2011) studied the implications of an intervention for 84 children (ages 4-11) with ASD and communication deficits. The study took previously researched information and expanded upon it through the use of PECS for children with Autism. This intervention was aimed at the improvement of communication and language skills through the use of pictorial support. By the end of the intervention, PECS was demonstrated to be an effective strategy in enhancing the spontaneity of children with ASD with respect to communication. Growth, however, was limited to the PECS training itself because spontaneous communication was not noted in social situations. PECS was a quick and easy way for children with Autism to learn how to respond to pictures with the object's appropriate title; however, the results do not indicate any long-term effects of communication enhancement through this particular medium.

Phonology

Phonology refers to the sounds that are associated with letters. There are 42 sounds – *phonemes* – which make up the English language. It is thought that phonological awareness has a lot to do with learning (Bradley & Bryant, 1983; Bruck, 1992; Manis, Custodio, & Szeszulski, 1993, as cited in Joanisse, Manis, Keating, & Seidenberg, 2000). Phonological awareness is imperative in learning to read, because letter-sound knowledge is essential to emergent literacy. Though spoken language is usually affected in Autism, it can sometimes present itself

with phonological impairments, in addition to semantic deficiencies. Problems with voice are common among persons with Autism; they include prosodic function and articulation deficiencies, thus straining peer understanding (Wilkinson, 1998).

Syntax

Syntax includes the formation of sentences based upon the rules of the language (Rice, 1989). Typically developing children will usually learn how to say words and understand their meanings before they learn sentence structures. Thus, young children's language is often confusing to adults because children's sentence structures are in the formative stage. The ability to proficiently express oneself through the use of spoken language is difficult because of the rules for ordering words, phrases, clauses and sentences, though most children acquire this skill during the pre-school years.

According to Noam Chomsky, humans are hard-wired to acquire language, thereby making it universal and unique within the species. This means that children are not taught the basis of language (syntax), rather they are born with the ability to procure language through what Chomsky calls a "Language Acquisition Device" (LAD). Komarova & Nowak (2001) argue that the LAD is a system of biological functioning that allows humans to easily acquire language until the beginning of the reproduction stage (Lenneberg, 1967). Through the onset of reproduction, not only can children speak and communicate with ease in their mother tongue, but they can also learn foreign languages much more easily than the period after which reproduction occurs (Ingram, 1989). This is valid because the LAD resides solely in the syntactical level. Syntactical, phonological and semantic insufficiencies in Autism impair one's ability to socially interact (Boucher, 2003).

Pragmatics

Pragmatics refers to language use in social contexts. It includes the reason for communication, rules of conversation, and the style in which speech is used in varying situations (Wilkinson, 1998). Children's ability to "grasp the different social and physi-

cal components of the communication situation" is the foundation through which pragmatic skills are obtained (Marcos, 2001, pg. 209). Pragmatic nonverbal and linguistic behaviors present themselves during early childhood; however, some behaviors are developmental, while others are acquired through social interaction. It is noted that children with ASD rarely use language as a means of social interaction. Instead they tend to use it only when absolutely necessary, such as requesting and protesting (Hart & Whalon, 2011). This pragmatic limitation in language exacerbates the difficulties with social interaction in children with ASD.

SOCIAL INTERACTION

Children diagnosed with ASD share a multitude of atypical behaviors that separate them from their peers. One of these characteristics includes the child's limited ability to learn auditorily (Ogilvie, 2011), resulting in difficulty accomplishing the task at hand and interacting among peers. Many studies have been conducted to reveal what type of intervention can be provided for the greatest positive change in a child's capacity to interact with others and learn in all aspects of their lives. One of the strategies most often used in the natural elicitation of social interaction is the use of activity schedules, which are 2-dimensional representations of daily routines through photos or drawings (Banda & Grimmette, 2008, p. 325). These images can be used to depict many different scenarios that a child may encounter. Morrison et. al. (2002) tested this intervention strategy in a preschool classroom to determine if children with Autism could use activity schedules to engage in positive peer interactions. This research team wanted to unveil the possibility of increased play with peers in children with Autism. Their findings show that children with ASD can acquire the skills to become socially integrated with their peers through play correspondence. The children who participated in the study were quickly able to learn the strategies employed by the therapists, while becoming adept to monitoring their own behavior. In addition, Banda & Grimmette (2008) argue that activity schedules develop social skills through teaching persons with Autism how to react more appropriately to change and daily transitions. Through

the development of skills for daily living, individuals become more independent (Anderson, Sherman, Sheldon, & McAdam, 1997). This method of scheduling activities with visual representations results in the child's acquisition of concrete building blocks needed for social integration with less disruption.

An additional therapeutic strategy is video modeling, a practice that has also been demonstrated to be effective in increasing the ability of a child with Autism to interact in social settings and initiate conversation (Ogilvie, 2011). This tactic is one that can be used in school, home, or community-based settings to give the child an idea of the type of behavior that is desired. (An adult with Autism noted that being told what to do is much more difficult to comprehend than seeing the desired behavior and then imitating it [Ogilvie, 2011]).

The use of video modeling is a way to show the child with ASD what task, behavior, or emotion needs to be executed by playing and replaying video recordings of the desired outcome. The effect of video modeling on conversational skills was a question that Charlop & Milstein (1989) sought to discover. Their method was to elicit dialogue between the child with Autism and the communicative partner via repeatedly showing video recordings of scripted conversations. Video modeling was shown to be an effective strategy for all subjects. While each of them was able to quickly learn the video modeling technique, they were also able to retain the information from the intervention well enough to use it even after the conclusion of the study. Charlop & Milstein believe that the intervention may have been effective because of memorization and echolailic features of Autism. Because of this common characteristic among the ASD community, video modeling is a "natural addition to teaching social skills" (Ogilvie, 2011, p. 21).

As discussed above, positive, meaningful social interactions are dependent upon communication; thus, children learn to become fluent speakers via interactions with other peers and adults. Additionally, social cognition "refers to the many different processes by which creatures understand and make sense of the world" (Frith, 2008). Processes most important to the devel-

opment of social cognition include *attribution, person perception* and *stereotyping*; these processes, according to Hotgraves & Kashima (2008) could not be achieved without language. "Social cognition [is] an examination of social interaction and how language is centrally involved as a tool in the process of constructing and exchanging meaning" (Holtgraves & Kashima, 2008, pg. 73). According to Rescorla & Mirak (1997) interpersonal relationships between an infant and its caregiver determine language development, as humans unconsciously develop the need to interact with others at birth. The ways they go about interacting with others stem from their communicative intents. During infancy, babies communicate by using their voice, which is limited to sound utterances. When babies cry, they elicit a sort of instinctual need for the caregiver to meet their needs. At this stage, infants are unable to use language to communicate, yet according to Rice (1989), they must hear language in use in order to master its system.

As babies grow into toddlers they learn how to say a few words (Rescorla & Mirak, 1997), however, gestural commands are more common. Although gestures are not a form of language, they are a nonverbal aspect of communication that allow others to detect a person's desires. The usual trajectory is that children develop meaningful peer relationships throughout middle childhood by the use of language appropriate to a social setting, through trial and error (Kuhl, 2004). Because children with Autism rarely use language, trial and error language acquisition is usually absent. Instead, intensive therapy must be provided for them so that a growth in spontaneous communication can occur.

Poor pragmatic skills result in the inability of a child with ASD to interact socially. Shores (1987) argues that in Autism, social interaction impairments range from atypical peer relationships to a lack of awareness of others, which is further complicated by an inability to hold multi-sided conversations in any setting (Boucher, 2003). As children with Autism are inserted into situations where social interaction is inevitable, they tend to display noticeable impairments, such as irregular movement of the

eyes and a lack of concentration, resulting in an absence of gaze holding (Banda & Grimmette, 2008). Children with ASD also exhibit repetitive and imitative language challenges, problems with recognizing interactive cues, and difficulties with turn taking (Jamieson, 2004). These social impairments make it difficult for them to interact with others; however, the deficiencies can be greatly improved through quality intervention. Koegel, Koegel, Hurley & Frea (1992) point out that researchers, scientists and psychologists have been able to discover interventions to improve the quality of this primary deficit noted in Autism (Fein, Waterhouse, Lucci, & Snyder, 1985).

CONCLUSION

Middle childhood is arguably the most crucial stage of human development in terms of social interaction mastery. During this stage, children experience the world outside of their home environment. Although family life has an impact on development in middle childhood, it is not the only factor which determines outcomes. Environments, peer interaction and cognitive development are all influences through which children's social maturation is achieved. Social interaction in children with Autism Spectrum Disorders is severely strained, due to neuro-developmental disorders causing multiple imperfections in many aspects of social development. Although the specific cause of Autism is still unknown, much is being done to try to improve the quality of life for persons with ASD. Much research has been conducted to document the areas of deficit and even more research is being carried out to discern solutions to reverse the vicious cycle of abnormalities. Data suggest that through properly utilized activity schedules, social initiations of children with Autism can be greatly improved. In addition, video modeling allows persons with Autism to be able to socially interact with others and become independent in their daily lives through rehearsed visual cues. The direction of future research needs to focus on larger groups of children with Autism as they compare to typically developing children.

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