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The Effect of Early Intervention on the Development of Receptive and Expressive Language Skills on Toddlers with Autism Spectrum Disorder

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Abstract

It is well known that one of the key characteristics in detecting Autism Spectrum Disorder (ASD) is difficulties with communication, along with social and cognitive impairments and repetitive behaviors. Difficulties with communication include deficits in both the understanding of language, known as receptive language, and the use of language, known as expressive language. The acquisition of language skills in toddlers with ASD differs from that of their typically developing peers. While both receptive and expressive language skills tend to be lower in individuals with ASD than neurotypical learners, researchers have found that learners with ASD tend to demonstrate greater impairments in the understanding of language than their use of language. This paper will outline the relationship between the development of expressive and receptive language skills in individuals with ASD in comparison to neurotypical individuals and individuals with developmental delays, as well as explore ways in which teaching these language skills have proven to be effective based on these findings.

Keywords: Early intervention, Autism Spectrum Disorder, Developmental Language Delay, Language acquisition, Receptive and expressive language, Speech Language Pathology

What is Autism Spectrum Disorder?

According to Autism Speaks (2021), Autism Spectrum Disorder (ASD) is defined as a developmental disability "characterized by challenges with social skills, repetitive behaviors, speech and nonverbal communication," affecting 1 in 54 individuals in the United States. With the onset of clear diagnostic criteria and a greater understanding of the genetic and environmental contributions to the etiology of autism spectrum disorder (ASD), ASD has emerged as a significant barrier to normal life for millions of Americans. Prior to the elucidation of ASD's underlying causes, many people with ASD or ASD associated symptoms were given incorrect diagnoses and therefore inappropriate therapies that unfortunately did not improve the prognosis for many sufferers. Dealing with a range of skills and challenges, ASD looks different in each diagnosed individual, making it difficult to detect by an unskilled clinician. This poses a problem, however, because ASD impacts many realms of daily life.

With the increase in research on the subject, ASD is now recognized as a fairly common disorder with the number of children aged 3 to 21 years old served under the Individuals with Disabilities Education Act (IDEA) increasing by almost 426,000 students between the 2008 and 2018 school years, and with that there has been a rise in the search for better therapies (NCES, 2020). Our increased knowledge of what ASD is is inextricably linked to the development of improved therapies, didactics, and perhaps eventually treatments and cures for this disorder. It is critical that individuals receive an accurate diagnosis as early as possible so that interventions can begin because "research shows that early intervention leads to positive outcomes later in life for people with autism" (Autism Speaks, 2021). Because of the emphasis on impaired communication for social interaction, identifying the characteristics of language development in individuals with ASD helps doctors and clinicians get a more accurate diagnosis in less time by distinguishing language acquisition patterns of those with ASD from individuals who have Developmental Language Disorders (DLD), a language deficit not caused by any known biomedical condition such as ASD or Down syndrome. This paper seeks to explain how these differences are detected and highlights therapies and teaching methods designed to improve ASD-related speech delays.

Receptive Language Development Evaluation Methods

Due to the challenges with measuring the understanding of language, the development of receptive language skills has been under-researched when compared to the history of the development of expressive language skills (Skwerer et al., 2016). A recent trend in the curiosity of the comprehension of language has prompted researchers to become more interested in the development of receptive language skills (Skwerer et al., 2016). One type of assessment of receptive language includes eye tracking. This method gauges the student's understanding of words and language processing skills based on the amount of time spent looking at two visuals that are presented with a spoken word which describes one of the displays (Petit et al., 2020). However, when dealing with populations in which gaze fixation or eye movements may be impaired, such as in ASD, these techniques are not suitable (Petit et al., 2020).

In response to this, researchers have developed a variety of assessments used for evaluating receptive language skills, such as the Clinical Evaluation of Language Fundamentals – 4th Edition (CLEF-4) (Sutherland et al., 2019). CLEF-4 is a more suitable assessment tool used by Speech-Language Pathologists (SLP) to gain insight on the understanding of language of students by assessing their ability to recall and formulate sentences, classify words, and follow directions (Sutherland et al., 2019). Another useful screening test, used particularly with infants

and young children for the evaluation of developmental delay, is the Sequenced Language Scale for Infants (SELSI), which gathers information about the student's expressive and receptive language skills through a series of 112 questions, 56 for expressive language and 56 for receptive language, to develop a language profile (Yim et al., 2017; Seol et al., 2014). SELSI is a language test originating in Korea and has been used to assess whether the characteristics of Autism Spectrum Disorder found in the West are also typical of Eastern populations. This is important because it eliminates differences in culture as a lurking variable in the discussion of the etiology of Autism Spectrum Disorder. The observation that these two different tests which are being compared to negate the effects of culture yielded similarly consistent results indicates that the characteristics of ASD are unavoidable and universal aspects of the disorder's development that may be due to a genetic etiology.

Sequenced Language Scale for Infants (SELSI) Research Findings

In one study done by a group of researchers based in Korea, 166 toddlers between the ages of 20 months and 50 months, were assessed using SELSI to determine language development level (Seol et al., 2014). Of the 166 subjects, 103 toddlers had been diagnosed with ASD and the remaining 63 toddlers had been diagnosed with DLD, both under the criteria of the DSM-IV-TR (Seol et al., 2014). From these two groups of toddlers, they were "divided into subgroups based on age (20-29 months, 30-39 months, 40-49 months), with no significant differences in the mean of each subgroup" (Seol et al., 2014). Raw SELSI scores for the two types of language skills (i.e., expressive, receptive) were converted into age equivalent (AE) scores, where each toddler was assessed and found to have lower scores than the expected scores of typically developing toddlers in both areas of language development (Seol et al., 2014). However, when compared to each other, those with DLD reported to have higher receptive language ability than the ASD group, but no substantial difference was found in the scores of expressive language skill. In order to calculate the type of language skill that proved to be dominant in the subjects, the receptive AE score was divided by the expressive AE score. From this, toddlers were classified as showing expressive language dominance type (ED) with a calculated score of less than 0.9, receptive language dominance type (RD) with a calculated score of greater than 1.1, or non-dominance type with a score between 0.9 and 1.1. Researchers found that the largest population of receptive dominance was in the DLD group, while the largest population of expressive dominance was found in the ASD group, outweighing those in the DLD group by about four times, "showing more impairment in the receptive language function in the ASD group" (Seol et al., 2014).

With regards to age group, the pattern of impaired receptive language in the 20-29 month old and 30-39 month old toddlers appeared to be much more evident. This early differentiation between ASD and DLD based on the language development of young learners is critical in detecting patterns in order to distinguish between the two disorders so that the proper interventions can be implemented. When diagnosing young learners, evaluating the language skills of these learners can provide important implications on the characteristics of the learner's development and language dominance type so that the correct diagnosis can be made. Using SELSI as an assessment tool can provide doctors and clinicians with this information, leading them to make judgements on the type of disorder or lack thereof based on which type of language skill the learner expresses dominance, where learners with ASD tend to favor expressive dominance and those with DLD tend to report receptive dominance.

Discussion of Findings

This study reiterates the known implications about early intervention. By being able to differentiate between ASD and DLD in the early stages of life, learners with ASD are more likely to show a decrease in the number of nonverbal statuses when intensive early intervention is applied (Seol, et al., 2014). This is also shown in the data from this study by the increase in non-expressive dominant cases in the 40-49 month old ASD group, which towered over the expressive dominant group by almost three times. The reason for this shift in dominance as learners increase in age is unclear, however, researchers speculate that these individuals were able to receive early interventions to enhance their receptive language skills because of their early diagnosis with ASD. Thus, differentiating ASD from other disorders such as DLD in the early stages of life can allow learners to receive therapies and interventions to support them in their receptive language abilities, whereas those who do not receive the same hasty interventions due to delayed or unidentified prognosis are more likely to continue to report impairment in receptive language ability.

From this study, we can learn the importance of early prognosis and intervention and understand a method of evaluation, SELSI, which can help to do so. Breaking apart language development into expressive ability and receptive ability and evaluating the individual on each of these skills provides greater insight into determining whether a learner has ASD or DLD. Toddlers with greater impairment to their receptive language abilities tend to be diagnosed with ASD rather than DLD because of the staple characteristic of ASD in which understanding language and being able to communicate for social interaction is often compromised.

Teaching Methods to Aid in Receptive Language Acquisition

Once toddlers are evaluated and given the diagnosis of having ASD, the next step is finding a way of teaching receptive language skills to best support them where they may tend to fall behind. One teaching method is Direct Instruction (DI) of language, a form of explicit instruction in which "students acquire, maintain, and generalize skills, ideas, and concepts in an efficient and effective manner" (Ganz & Flores, 2008). According to the National Institute for Direct Instruction (NIFDI, 2021), one type of highly systematic and explicit instructional tools used in education is the *Language for Learning* (Engelmann & Osborn, 1999) program, in which students are taught "the basic vocabulary, concepts and sentence forms used in typical classroom instruction." These skills are important for children with language deficits because of the myriad of potential negative outcomes that could arise due to these deficits. Benner et al. (2020) identifies these as "persistent depressed academic achievement, increased grade retention, demoralization, reading abilities, and emotional and behavioral disorders" (p. 67).

Waldron-Soler et al. (2002) investigated the *Language for Learning* program at multiple sites in Washington State. Their 15-week intervention found that the DI *Language for Learning* is an effective method of teaching expressive and receptive language skills to preschoolers with developmental delays as "the scores of children with developmental delays instructed with *Language for Learning* increased more than children with developmental delays who did not receive instruction with *Language for Learning*" (Waldron-Soler et al., 2002). This finding provides insight on the effectiveness of Direct Instruction (DI), specifically *Language for Learning*, as an instructional tool for the education of students with developmental delays.

However, while this study was done on preschoolers with developmental delays, none of those students were diagnosed with ASD. In response, another group of educational researchers went on to test the effects of the *Language for Learning* DI program on students with

developmental delays, this time including participants with ASD in their study (Ganz & Flores, 2008). This study focused on language understanding and connections. This was done by asking the students to name two items that match the verbal description given by the teacher or therapist first from a set of eight given objects, then images, and eventually, words only. This sequence of instruction, often referred to as the concrete-representational-abstract (CRA) sequence, has proven to be an evidence-based practice in scaffolding students who may have difficulty understanding abstract concepts by bridging the gap between concrete and abstract in a strategic and effective manner (Bouck et al., 2018). The person administrating the instruction was to follow a script with minor modifications and use an explicit signal to cue student responses (Ganz & Flores, 2008). Students were to respond chorally. In the event that the incorrect response was given, the teacher would use proper correction procedures, "modeling the correct response, chorally responding with the students, then asking the students to respond independently" (Ganz & Flores, 2008). This was found to improve the reading decoding and reading comprehension skills of the ten subjects observed in this study, maintaining these skills even after the intervention was terminated, with one student even found to generalize these skills to other settings and people (Ganz & Flores, 2008). This study provides important implications about the relationship between Direct Instruction (DI) as a tool for expressive and receptive language development in learners with ASD and other developmental delays, proving that it is a highly effective instructional device.

Conclusion

Individuals with Autism Spectrum Disorder (ASD) tend to report lower proficiency in receptive language development than individuals with Developmental Language Delays (DLD). Learners with ASD tend to be expressive language dominant, while those with DLD display receptive language dominance. This finding has important diagnostic and educational implications. The observation of greater impairment to receptive language skills in learners with ASD relative to those with DLD can serve as a diagnostic tool for clinicians assessing patients. Additionally, this finding can help educators tailor the educational experience by engaging with the students' strengths while acknowledging their deficits. Early intervention has shown to improve receptive language outcomes in students with ASD. One effective educational strategy used to instruct individuals with developmental delays and ASD is the Direct Instruction (DI) program, *Language for Learning*. This type of explicit instruction supports students in their language development, improving their proficiency in both areas of language, expressive and receptive. From these studies, we can gain a better understanding of how to properly diagnose young learners and give them the appropriate tools and strategies needed to ensure better outcomes for a better quality of life.

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