United Arab Scientific Publishing

Saudi Journal of Human Sciences
Eighth Edition
Volume (3) Issue (3)
(1_10) 2025

المجلة السعودية للعلوم الإنسانية
Saudi Journal of Humanities

Linguistic Profiles and Communication Challenges in Children with Autism Spectrum Disorder A Narrative Review

Kara, Nada
(Department of English Language, University of Tripoli. Tripoli, Libya)
Published electronically on August 10, 2025 AD

Abstract :

Autism Spectrum Disorder (ASD) is a neurodevelopmental condition that significantly affects communication and language abilities. This paper discusses the distinctive language characteristics observed in children with autism, including speech development delays, echolalia, pragmatic language impairments, nonverbal communication deficits, and atypical prosody. Furthermore, it discusses the neurobiological foundations of these language impairments, common assessment methodologies, and the importance of individualized therapeutic interventions in enhancing communicative abilities. Understanding these linguistic features is essential for the formulation of effective intervention strategies. This paper also highlights the critical roles of caregivers and educators in language development and reviews recent advancements in research supporting language acquisition in autistic children.

Key words:

(autism spectrum disorder, speech and language disorders, communication difficulties)

1. Introduction

Autism Spectrum Disorder (ASD) is defined by persistent challenges in social communication and interaction, as well as restricted, repetitive behaviors, interests, or activities (American Psychiatric Association, 2013). Although ASD presents with considerable heterogeneity, impairments in speech and language are among its hallmark features. These impairments may range from complete absence of verbal communication to the presence of atypical speech and language patterns.

This paper explores the speech and language profiles of children with ASD by examining linguistic subdomains including phonology, morphology, syntax, semantics, pragmatics, and prosody. Furthermore, it discusses the neurological and cognitive mechanisms underpinning these impairments and highlights evidence-based intervention strategies aimed at improving communicative outcomes for autistic children.

2. Speech and Language Development in Children with Autism

Human beings are innately equipped with the capacity to communicate. From birth, infants demonstrate awareness that their actions elicit responses—such as crying when hungry to gain a caregiver's attention—marking early forms of communication. Language acquisition, both verbal and nonverbal, occurs through environmental exposure, imitation, and joint attention. Joint attention, typically emerging in the second year of life, is a crucial milestone in social development. As noted in the literature, it marks the transformation from basic interaction to complex social behavior (Vogindroukas et al., 2022).

A fundamental impairment in children with Autism Spectrum Disorder (ASD) lies in joint attention. According to a study by Adamson et al. (2019), children with ASD and limited expressive language showed significant delays in joint attention, while typically developing peers with age-appropriate language skills demonstrated no such difficulties.

Play is another essential component of language acquisition. Active engagement in play facilitates language learning and social skill development, allowing children to imitate linguistic and social behaviors observed in their environment. As Ruth Deborah et al. (2019) explain, "Play fosters language development in young children by establishing an effective language-learning environment." Intact social and symbolic play skills are precursors to both receptive and expressive language abilities. Through symbolic play—where children participate in similar activities with interaction and shared materials—they acquire social skills such as sharing, turn-taking, and cooperation, which are foundational for empathy and social cognition.

While play may appear instinctive to neurotypical children, those with autism often face substantial challenges in this area. Difficulties with joint attention, imitation, and understanding symbolic representation can hinder their engagement in play-based learning (Functional Play Skills for Autism, 2024).

2.1 Delayed Language Development

A substantial number of children diagnosed with Autism Spectrum Disorder (ASD) exhibit delays in language acquisition, with some remaining minimally verbal throughout their lives (Tager-Flusberg et al., 2017). These delays often involve a late onset of first words and difficulties combining words into coherent, meaningful utterances. Compared to typically developing peers, autistic children demonstrate slower vocabulary growth and challenges with lexical retrieval (Eigsti, 2011).

Notable linguistic patterns in children with ASD include repetitive or echolalic language, the use of unconventional or idiosyncratic expressions, overly pedantic language, and difficulties with pragmatic language, such as the misuse of personal pronouns (Tager-Flusberg et al., 2005). Their spoken language frequently diverges from topic relevance.

Another notable challenge is the deficit in Theory of Mind (ToM)—the ability to attribute mental states to oneself and others. This cognitive ability is vital for effective social communication, including turn-taking and understanding others' perspectives. As outlined by researchers (2014), individuals with ASD often struggle to comprehend the beliefs, intentions, and emotions of others, which further compounds their communicative difficulties.

2.2 Phonological Characteristics

Children with ASD often exhibit phonological impairments, including atypical speech sound production, articulation challenges, and inconsistent pronunciation. Common speech sound disorders among this population involve hypernasality, unusual vocal quality, and inaccurate speech sound articulation. Literature indicates that while some phonological processes resemble those seen in typically developing children, others are unique to the ASD population.

According to a study by Wolk et al. (2016), both autistic and neurotypical children demonstrated typical processes such as stridency deletion, liquid assimilation, fronting, gliding, stopping, post-vocalic devoicing, reduplication, final consonant deletion, weak syllable deletion, vowelization, and pre-vocalic voicing. However, a range of atypical processes were also identified in autistic children, including deaffrication, migration, palatalization, pre-vocalic devoicing, post-vocalic voicing, syllable coalescence, backing, metathesis, epenthesis, initial consonant deletion, medial consonant deletion, and vowel deviations.

2.3 Morphosyntactic Deficits

Children with autism frequently present deficits in morphosyntactic development. These include difficulties in the application of grammatical morphemes, the correct use of verb tenses, and the construction of syntactically appropriate sentences (Roberts et al., 2014). They tend to produce fewer complex sentence structures and often make errors involving subject-verb agreement and pronoun use.

Specific linguistic features characteristic of this population include pronoun reversals (e.g., using "you" instead of "me"), poor comprehension of emotion-related vocabulary, reduced sensitivity to grammatical violations, incorrect verb tense usage, and omission or incorrect use of articles and conjunctions. Research by Omnya (2018) also indicates a decreased frequency of interrogative and negative constructions in the speech of children with ASD.

2.4 Pragmatic and Social Communication Challenges

Pragmatic language—the use of language in social contexts—is particularly impaired in children with ASD. These children often encounter significant obstacles in sustaining conversations, recognizing conversational turns, and interpreting figurative language such as idioms, sarcasm, or metaphors (Adams et al., 2012). Joint attention deficits, including difficulty following eye gaze or pointing gestures, further inhibit effective communication (Mundy, 2016).

A comparative study of pragmatic language in individuals aged 9 to 17 with ASD and those with typical development revealed a range of deficits in the ASD group (Paul, Landa, & Simmons, 2014). These included limited turn-taking, reduced variety in speech acts, inappropriate judgments regarding the amount of information to convey, challenges in adopting others' perspectives during conversations, and poorly structured narratives. Additionally, individuals with ASD often use overly formal or pedantic language, which can create social barriers among peers.

2.5 Prosodic Variations

Prosody encompasses the rhythm, stress, and intonation of speech. Many children with ASD display atypical prosodic features, such as flat intonation, misplaced stress patterns, or overly exaggerated intonation contours (Diehl et al., 2012). These characteristics can result in speech that appears mechanical or unnatural, potentially impairing social engagement and listener perception.

Research from Patel (2020) further supports these findings, reporting that individuals with ASD often exhibit a lower fundamental frequency and a slower rate of speech, both of which contribute to their distinctive prosodic profile.

3. Neurological and Cognitive Underpinnings of Speech and Language Impairments in ASD

Neuroimaging studies have revealed structural and functional abnormalities in brain regions associated with language processing in children with Autism Spectrum Disorder. Reduced activation has been observed in Broca's area,

which is involved in speech and language production, and in Wernicke's area, associated with language comprehension.

Additionally, decreased connectivity has been reported in the superior temporal gyrus, a region implicated in working memory (Redcay & Courchesne, 2010). These neurological variations may explain the difficulties autistic individuals face in producing and understanding spoken language.

Moreover, atypical functioning of the mirror neuron system may hinder imitation and speech production abilities. Given that imitation plays a foundational role in language learning, such deficits can significantly delay linguistic development. Executive functioning challenges, such as limited cognitive flexibility and impaired working memory, also contribute to language processing difficulties in this population (Kenworthy et al., 2013).

4. Intervention Strategies and Therapy Approaches

4.1 Speech and Language Therapy (SLT)

Speech-language pathologists (SLPs) utilize a range of evidence-based techniques to support communication in children with ASD. Prior to therapy, a child with ASD, must go through a rigorous procedure of assessment and diagnosis to gain an evidence-based qualitative and quantitative data to aid emplaning and implementing therapy for each individual. It should be taken into consideration, that not all standardized assessments can be utilized for all populations. Assessments created for particular communities and/or languages should be utilized exclusively for those communities. For example, when an assessment tool standardized for an English-speaking population should not be used for speakers of other languages because it will not provide a precise qualitative and age-appropriate score.

There are a variety of structured methods and techniques for therapy, such as the Picture Exchange Communication System (PECS) and Augmentative and Alternative Communication (AAC) tools, and parent-based therapies that have proven effective for nonverbal children (Flippin et al., 2010).

4.1.1 There has been an increased emphasis on caregiver-implemented intervention in the field of early intervention. However, this form of intervention can be effective only if the provider has the skills to teach, scaffold and coach the caregiver within a supportive, collaborative partnership. In linguistics, scaffolding refers to "the concept that learning is best enabled when appropriate levels of support are provided at different stages of language development. It is a temporary framework that provides support and access to meaning during language acquisition. (Garside, 2020)". More Than Words—The

Hanen Program for Parents of Children with Autism Spectrum Disorder, is a manualized parent-implemented intervention for groups of parents and caregivers. In this program, the speech-pathologist assumes the role of mediator, utilizing specific techniques and activities based on adult education principles, providing a multifaceted, collaborative learning experience that enables parents to become effective language facilitators for their child.

4.1.2 Augmentative and alternative modes of communication

Augmentative and Alternative Communication (AAC) can be broadly categorized into two main types: aided and unaided, as well as low-tech and high-tech systems. Aided AAC involves the use of external physical tools or devices, such as real objects, visual aids, communication boards featuring photographs or words, switches, or electronic devices like iPads. In contrast, unaided AAC relies solely on the individual's body and does not require external tools—examples include sign language and natural gestures.

Low-tech AAC refers to communication methods that do not involve electronic technology, such as choice boards, swing tags, and gestures. High-tech AAC, on the other hand, utilizes electronic devices, including tablets, iPads, and voice output communication aids.

The selection of the most appropriate AAC system for an individual with complex communication needs should be guided by a qualified speech pathologist with expertise in AAC. This process involves a structured approach encompassing assessment, trial, implementation, and ongoing review. Key factors considered include the individual’s communication needs, preferences, access barriers, and opportunities for participation in various settings.

4.1.3 Picture Exchange Communication System (PECS)

The Picture Exchange Communication System (PECS) is an augmentative and alternative communication system designed to help individuals with little or no communication abilities express their needs and desires using pictures. PECS allows users to initiate communication by exchanging pictures of desired items with others.

4.2 Applied Behavior Analysis (ABA) and Naturalistic Approaches

ABA-based interventions like the Early Start Denver Model (ESDM) use structured reinforcement techniques to encourage desired communicative behaviors (Rogers & Dawson, 2010). Naturalistic strategies, such as Pivotal

Response Treatment (PRT), emphasize child-led interactions and integrate language development into everyday activities.

4.3 Parent-Implemented Interventions

Parental involvement plays a vital role in facilitating language development in children with ASD. Teaching parents responsive interaction strategies—such as modeling and expanding on their child's speech—has shown to significantly enhance communication skills (Siller & Morgan, 2018).

4.4 Assistive Technology and Digital Applications

Recent technological advancements offer alternative avenues for communication. Devices that generate speech and mobile applications designed for communication support have been instrumental in helping children with limited verbal abilities express themselves (Warren et al., 2011).

4.5 Medical and Pharmacological Treatments for Autism

In recent years, several promising developments have emerged in the field of autism treatment (Dell'Osso, L., et al, 2025). These advancements aim to enhance social interaction, improve language and communication skills, and expand access to diagnosis and intervention. The following are some notable innovations in this evolving landscape:

Balovaptan: Enhancing Social Interaction Balovaptan is a pharmacological agent that modulates oxytocin receptors in the brain. Findings from a phase 2 clinical trial involving nearly 500 adolescents and adults with autism indicated a 15% improvement in social interaction compared to a placebo group. Notably, participants demonstrated increased accuracy in recognizing emotional facial expressions—a common challenge among individuals with autism. Additionally, Balovaptan showed potential in reducing repetitive behaviors, a core characteristic of autism spectrum disorder (ASD).

CM-AT: Supporting Language and Social Development CM-AT is an enzyme-based therapy derived from pancreatic enzymes, which has demonstrated encouraging results in enhancing language and social interaction in children with autism. In a phase 2 clinical study, children receiving CM-AT experienced significant gains in both communication and social engagement compared to those in the placebo group. This therapy represents a novel direction in supporting early developmental outcomes in children with ASD.

Transcranial Magnetic Stimulation (TMS): Advancing Communication Skills
Transcranial Magnetic Stimulation (TMS) is a non-invasive neurostimulation technique that uses magnetic fields to target specific brain regions. Recent

studies have shown that daily application of TMS can yield notable improvements in language acquisition and social communication in young children with autism. This method presents a potential new avenue for addressing communication-related difficulties in ASD through brain-based interventions.

Telemedicine: Expanding Access to Diagnosis and Care Telemedicine has become an increasingly valuable tool in broadening access to autism diagnostic and therapeutic services, particularly in underserved or remote communities. Through remote video consultations and assessments, healthcare providers can offer timely and comprehensive evaluations, helping to reduce disparities in autism diagnosis and treatment. This innovation holds significant promise in enhancing equity and continuity of care.

Suramin: Promoting Language and Social Communication Suramin, a drug traditionally used to treat parasitic infections, has shown potential in improving language and social communication in children with autism. Results from a phase 2 trial indicated positive outcomes, including reductions in repetitive behaviors and enhanced social engagement. Suramin offers a promising direction for future therapeutic development targeting core symptoms of autism.

These advancements reflect meaningful progress in autism research and treatment. Although further investigation and long-term studies are required to confirm their efficacy and safety, these innovations represent important steps toward improving the quality of life and developmental outcomes for individuals on the autism spectrum. Ongoing research and interdisciplinary collaboration remain essential to fully realize the potential of these emerging therapies.

5. Conclusion

Speech and language impairments are fundamental characteristics of Autism Spectrum Disorder, affecting a wide array of communicative and social behaviors. These impairments manifest across multiple domains, including phonology, morphosyntax, pragmatics, and prosody, and vary significantly among individuals with ASD.

An understanding of the neurological and cognitive bases for these challenges has informed the development of targeted therapeutic interventions. Evidence-based approaches, including speech-language therapy, behavioral interventions, and the use of assistive technology, have shown promise in improving language outcomes for autistic children.

Future research should continue to explore innovative and individualized treatment strategies, with a focus on promoting functional communication and enhancing quality of life for individuals with ASD.

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