



## The Relationship Between Joint Attention and Communication Skills of Children with Autism Spectrum Disorder

Saad Yahya Athbah<sup>1</sup>

### ARTICLE INFO

### ABSTRACT

#### Article History:

Received: 13 October 2023

Received in Revised Form: 12 November 2023

Accepted: 01 December 2023

DOI: 10.14689/ejer.2023.108.019

#### Keywords

Joint Attention, Communication Skills, Quasi-experiment, Joint Attention, Children with Autism Spectrum Disorder.

**Purpose:** The aim of this study was to evaluate the efficacy of the joint attention program in enhancing both verbal and nonverbal communication skills among children diagnosed with autism spectrum disorder (ASD). Additionally, the study sought to assess the sustained effectiveness of the program one month after its completion. **Method:** Employing a quasi-experimental design with pre-test, post-test, and follow-up assessments, the research sample comprised 24 children recruited conveniently from the Jeddah Centre for Autism.

**Findings:** Results indicated statistically significant improvements in both verbal and nonverbal communication skills following program implementation. **Implications for Research and Practice:** However, neither the post-test nor the follow-up assessments revealed statistically significant changes in communication skills.

© 2023 Ani Publishing Ltd. All Rights Reserved.

<sup>1</sup> The University of Jeddah, College of Education, Department of Special Education, Jeddah, Saudi Arabia  
ORCID iD: <https://orcid.org/0000-0003-2813-0336>, Email: [sathbah@uj.edu.sa](mailto:sathbah@uj.edu.sa)

## Introduction

Autism spectrum disorder stands as a formidable and intricate challenge within the realm of special education, as extensively discussed across various methodologies and theoretical frameworks (Antipova & Miticheva, 2019). Given its pervasive impact on multiple domains encompassing behaviour, emotions, social interactions, language acquisition, communication, cognition, and sensory processing, each individual afflicted with this disorder presents a distinct clinical profile (Akhmetzyanova & Artemieva, 2020). The Fifth edition of the Diagnostic and Statistical Manual of Mental Disorders underscores the early emergence of autism symptoms, notably chronic impairments in social communication and interaction across diverse contexts, alongside patterns of repetitive behaviours and narrow interests (Akhmetzyanova & Artemieva, 2020). These symptoms typically surface in early developmental stages, precipitating conspicuous deficits in various spheres of functioning, including social integration, vocational pursuits, and other adaptive domains (Thomas et al., 2019).

The challenge posed by an autistic child's inability to effectively communicate needs or thoughts to family members stands out as a significant source of frustration for parents and other family members (Belyaeva, 2020). Ranging from minimal verbal communication abilities to maximal deficits in social communication and interaction, autistic children encounter obstacles in expressing themselves and engaging socially (Hwang & Lee, 2022). Consequently, siblings and parents may struggle to discern their needs and interact effectively, leading to manifestations of intense emotions such as anger, frustration, and potentially harmful behaviours, including self-directed actions (Koçak Uyaroğlu et al., 2021). Contemporary research suggests that sustained interventions, both within specialized centres and through home-based activities reinforcing therapeutic strategies, hold promise for enhancing language skills among autistic children, even extending beyond the age of four.

Challenges in language and communication, particularly verbal fluency, are commonly observed in children diagnosed with autism spectrum disorder (Botha et al., 2021). Moreover, these difficulties exhibit variability across age groups and among individuals (Fahmy, 2022). Certain characteristics associated with language and communication difficulties in autistic children may also be present in typically developing children. However, the majority of these challenges tend to diminish or resolve as individuals age and as their communication skills improve (Laribi, 2022). Nevertheless, some traits may persist from infancy into adulthood. Recognizing the idiosyncrasies of language acquisition in individuals with autism spectrum conditions is crucial, emphasizing the importance of tailored training approaches (Zhao & Chen, 2018).

A child diagnosed with autism spectrum disorder frequently exhibits challenging and unresponsive behaviours, which may manifest as negative conduct (Accardo & Finnegan, 2019). Early intervention is often necessary for these children to address communication difficulties, facilitating the acquisition of various means to express emotions and feelings and fostering natural communication instincts (Botha et al., 2021). This process typically involves creating an appropriate environment wherein the child can develop visual communication skills, such as indicating needs through gestures, bodily movements, or utilizing a natural tone of voice (Brignell et al., 2018).

Research indicates that a significant proportion, around 50%, of autistic children do not

develop verbal language skills and do not compensate through gestures or pretend play in their communication (Dyer, 2022), often accompanied by challenges in making eye contact. Language development in autistic individuals typically begins with receptive language, encompassing the ability to comprehend and understand language without verbal expression, followed by expressive language, which includes spoken, written, and sign language, involving the capacity to articulate and communicate linguistically (Ali et al., 2022).

From an analytical standpoint, Nyström et al. (2019) inferred that shared attention plays a pivotal role in fostering communication and social interaction development in children diagnosed with ASD, wherein the child aligns their focus and interest with another individual towards a particular subject, object, or event. This mode of communication encompasses various manifestations, such as the child indicating an object or another person, utilizing this form of interaction to direct attention towards the subject, object, or event before verbal articulation occurs. Cilia et al. (2020) asserted that through joint attention, the child not only shares interests but also gains insight into the emotional states of others, underscoring its significance as a developmental milestone offering multiple educational and training opportunities. As early as nine months, children may begin to follow their parents' gaze and mimic their actions, concurrently attending to both the object, person, or activity and the adults' reactions. Franchini et al. (2019) defined joint attention as the ability to engage with others in social contexts by sharing experiences and interests regarding objects and events. However, children with ASD often encounter communication challenges due to deficits in joint attention, stemming from their reluctance to engage socially and share experiences with others. Montagut-Asunción et al. (2022) further delineated joint attention into two facets: joint attention to events or actions and joint attention to comprehension. Although children with autism may execute initial gestures, they struggle to employ these cues effectively to convey their interests to others. Alokla (2018) identified three factors influencing participation in joint attention interactions among children with ASD: cognitive-linguistic development, imitation, and environmental organization. Subsequently, Bin Omar and Kharoubi (2019) observed deficits in both the quantity and quality of joint attention among autistic children.

In light of these observations, the research concept arose to explore the relationship between joint attention and communication in children with ASD. This study aims to address the following inquiries:

- RQ1:** Are there any differences in the scores of the control and experimental groups after using the suggested program on joint attention to measure communication skills?
- RQ2:** Are there any differences in the communication skills of the experimental group before and after the implementation of the program?
- RQ3:** Are there any changes in the experimental group scores on the communication skills scale in the post- and follow-up application?

### Literature Review

The French physician Leo Kanner, affiliated with Hopkins University in the United States of America, is credited with the initial identification of ASD in 1943 following his examination of a cohort of children diagnosed with mental retardation (Dyer, 2022). These children exhibited marked traits of extreme introversion, demonstrating a profound disinterest in or lack of response to their surroundings, coupled with a notable insensitivity

to environmental stimuli, suggesting a cessation of sensory information processing from external sources (Hillier et al., 2018). Consequently, these individuals struggle to develop conventional social interactions akin to their neurotypical counterparts (Holmes, 2022).

Similarly, the Austrian physician Hans Asperger independently recognized a distinct pattern of atypical behaviour among a group of adolescents, coining the term "autistic psychopathy" to describe this behavioural pattern, denoting a deviation or irregularity in personality (Simón et al., 2022). Despite Asperger's documentation of these behaviours and patterns in Germany during wartime, featuring detailed clinical descriptions, his work remained relatively obscure. However, subsequent literature suggests that both Kanner and Asperger delineated descriptions of identical symptoms and the same underlying disorder (Stark & Lindo, 2022).

This condition has been labelled with various terms over time, including Early Childhood Autism, Childhood Schizophrenia, and Atypical Ego Development. In the mid-1960s, investigative efforts confirmed the presence of neurological anomalies in individuals with autism (Van Tran & Weiss, 2018). By 1980, autism began to be diagnosed as a severe emotional disorder, but the American Children's Association revised its classification, now recognizing it as a pervasive developmental condition rather than solely an emotional impairment. In 1981, advocacy from organizations such as the National Association for Autistic Children and the National Institute for Neurological and Communication Disorders led to autism being acknowledged as a health concern, a position further supported by a coalition of global entities. Subsequently, in 1994, the American Child Psychiatric Association endorsed the categorization, placing autism within the spectrum of comprehensive developmental disorders, a classification later affirmed by the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition.

The term "autism" originates from the Greek word denoting "loneliness" or "isolation" and encompasses a broad array of symptoms, including social withdrawal and disinterest in interpersonal interactions, often perceived as a pathological condition (Belyaeva, 2020). ASD is a neurodevelopmental condition that disrupts a child's learning and socialization abilities from early infancy, altering typical brain function and hindering communication and social engagement. Emerging in the early years of life due to physiological irregularities affecting brain function and subsequent development, ASD presents challenges in social interaction, verbal and nonverbal communication, resistance to environmental changes, and repetitive behaviours (von Below et al., 2021). It constitutes a pervasive developmental condition characterized by early onset and distinct patterns of atypical behaviour across the domains of social interaction, communication, and restricted repetitive behaviours (Vanegas, 2019).

Studies conducted in both England and the United States have identified a prevalence rate of approximately 4 to 5 affected children per 10,000, while investigations in other nations have reported even lower rates, with fewer than 5 cases per 10,000 children (Colombo-Dougovito & Block, 2019). The escalating prevalence of ASD has led to its designation as a national public health crisis, with estimates indicating a prevalence ranging from 10% to 17% in the United States (Ruggeri et al., 2020). This surge in prevalence can be attributed to heightened public awareness of the condition and advancements in diagnostic criteria (Ruggeri et al., 2020). Discrepancies in prevalence rates across regions are influenced by genetic and environmental factors.

Autism presents a complex disability, profoundly impacting a child's personality and

communicative abilities, thereby posing significant challenges in education, behavioural regulation, vocational preparation, cognitive development, attainment of economic and social independence, and self-defence capabilities, even in minimal capacities and for a limited subset of individuals (Hollis et al., 2017; Licari et al., 2020).

Common non-diagnostic issues in autism include irrational fears, sleep disturbances, temper outbursts, and self-directed anger. One of the persistent developmental impairments emerges within the child's first three years, featuring stereotyped, repetitive behaviours and disruptions in motor, social, emotional, and linguistic development (Hwang & Lee, 2022). According to the American Psychiatric Association, signs of social isolation, cognitive deficits, language challenges, and interpersonal aggression may be evident in autistic individuals as early as thirty months of age (Vanegas, 2019). Initial diagnosis may be uncertain, particularly regarding conditions related to social isolation affecting communication and interaction quality (von Below et al., 2021). Autism often manifests before age three, significantly impacting a child's development and academic performance. Characterized by deficient social skills and apathy towards others' emotions, especially parental figures, autism leads to profound isolation and detachment from reality, resulting in repetitive speech and movement patterns and resistance to environmental changes (Dyer, 2022).

Communication difficulties are a defining feature of autism, as first recognized by Leo Kanner in 1943. Autism is categorized as a communication disorder characterized by qualitative deficits in social interaction, alongside repetitive behaviours and restricted interests (Bin Omar & Kharoubi, 2019). Gesture communication, crucial in early language development, is notably limited in children with autism, with gestures being primarily used for requests rather than initiating conversations (Accardo & Finnegan, 2019; Nyström et al., 2019). Compared to peers with developmental challenges, children with autism demonstrate reduced initiation and responsiveness to verbal communication, fewer gestures, increased echolalia, and stereotypic behaviours (Franchini et al., 2019). Lack of eye contact and gesturing by age three are significant predictors of language development in autism. Expressive language fluency and adaptability are key criteria for determining the functioning level of individuals with autism (Akhmetzyanova & Artemieva, 2020).

The deficiency in communication skills often leads autistic children to withdraw from their social environment and engage in maladaptive behaviours, consequently experiencing heightened rejection from others (Montagut-Asunción et al., 2022). However, upon acquiring practical communication skills and learning to manage intense emotions such as anger and frustration, these behaviours tend to diminish (Hwang & Lee, 2022). Communication, as a process of interaction with others, encompasses various forms including verbal, conversational, and physical expressions, facilitating the sharing of knowledge, concepts, and emotions that promote social bonding within society (Hwang & Lee, 2022). Symbolic representation plays a crucial role in communication, as individuals assign meanings to specific symbols, enabling the formation of mental images (Belyaeva, 2020). These symbols can manifest as words, signs, characters, numbers, colours, bodily gestures, or abstract concepts, facilitating communication (Cilia et al., 2020).

Communication is categorized into two types based on its nature. Verbal communication involves the mutual exchange of ideas, perspectives, and meanings through spoken language, involving a message, a sender, and a recipient, relying on

linguistic abilities (Brignell et al., 2018). Nonverbal communication, on the other hand, utilizes nonverbal cues such as facial expressions, smiles, and gestures to convey messages and meanings (Botha et al., 2021). Both verbal and nonverbal communication rely on a child's ability to acquire various skills, including language comprehension and expression, as well as their capacity to interpret and respond to social cues (Belyaeva, 2020). Any impairment in these abilities can lead to deficits in overall communication proficiency.

Effective intervention strategies must consider the prevalent notion that autism is predominantly influenced by inherited or genetic factors (Fahmy, 2022). Given that symptoms of this disorder typically emerge in early childhood and prominently involve social communication deficits, researchers have proposed that environmental factors and external stimuli play a contributory role in its ethology (Liang et al., 2020). Consequently, it is imperative to ensure that individuals with ASD have access to interventions aimed at enhancing their social skills, communication abilities, and interpersonal interactions (Liang et al., 2020). Notably, compared to those who receive conventional interventions, individuals with ASD enrolled in pivotal response programs exhibit significant improvements in their communication skills (Antipova & Miticheva, 2019).

Joint attention serves as a critical component of communication. According to Koçak Uyaroğlu et al. (2021), the acquisition of language and other cognitive skills relies on joint attention, which forms the basis for shared attention to a common object. Franchini et al. (2019) suggest that deficits in nonverbal communication stem from deficiencies in joint attention abilities. The development of purposeful communication is accompanied by the continual emergence of joint attention skills, wherein two individuals simultaneously focus on a shared object while also monitoring each other's attention towards it. In children with autism spectrum disorders, meaningful communication opportunities arise when the autistic child disregards requests for shared attention and directs focus elsewhere. However, deficits in joint attention may impede a child's ability to attend when prompted or maintain focus on a designated item, resulting in missed communication opportunities (Cilia et al., 2020).

According to Nyström et al. (2019), children diagnosed with autism spectrum disorder (ASD) may utilize eye contact to request joint attention, although establishing joint attention between a person and an object is infrequent. Furthermore, the ability to respond to the joint attention initiated by others is positively correlated with receptive language skills and the average length of speech in these children. Montagut-Asunción et al. (2022) underscored the significance of joint attention interactions in child development, emphasizing that the capacity for reciprocal interactions based on shared interests is pivotal for language acquisition.

Understanding the frame of reference is crucial for a child's comprehension when caregivers mention items or events present in the environment. For example, when a mother references a "duck" in the bathtub while bathing the child, the child's comprehension relies on grasping the specific object indicated. Conversely, failure to understand the adult's perspective may lead the child to interpret the term "duck" broadly, encompassing various objects in the bathroom. Therefore, to learn the name of an item, the child must focus on the object indicated when the caregiver points and verbalizes its name. Failure to do so renders the spoken words irrelevant, as the child lacks comprehension of the referent being communicated (Antipova & Miticheva, 2019).

Joint attention plays a pivotal role in the language development trajectory of children with ASD, as highlighted by Bin Omar and Kharoubi (2019). High levels of joint attention



at 20 months are positively associated with language development at 42 months in children with ASD. Notably, receptive language development, rather than expressive language, is significantly and positively linked to joint attention task performance at 20 months, emphasizing the enduring importance of joint attention for language acquisition across developmental stages (Montagut-Asunción et al., 2022).

Manwaring and Stevens (2017) conducted an investigation into the impact of joint attention (JA) therapies on the language outcomes of individuals diagnosed with ASD. Their analysis encompassed a review of 21 papers exploring this subject matter, revealing that more than half of the studies employed a combination of treatment techniques targeting attention. Among the participants involved in ten of the twenty studies focusing on expressive language, those who underwent joint attention training demonstrated significant improvements.

Sarra and Amine (2018) examined the effects of a program centred on shared joint attention on the verbal communication skills of children with autism spectrum disorder, considering its potential influence on social interactions and societal integration. The study comprised a homogenous sample of ten eight-year-old individuals with autism spectrum disorder, without concomitant conditions, showing significant statistical differences in mean scores between pre- and post-tests.

Manis (2019) investigated the influence of household size (referred to as "parity") on the relationship between initiating joint attention (IJA) and language development. The study involved 70 infants from the Program for the Study of Infancy at East Tennessee State University, primarily from affluent white households, revealing no significant overall correlation between IJA and language development. However, a significant correlation was observed among infants residing in single-child households. Ali et al. (2022) explored the communication patterns and joint attention abilities of children with autism spectrum disorder, drawing a purposive sample from four institutes specializing in the rehabilitation of individuals with special needs in the Sohag Governorate. The sample comprised 35 children with autism spectrum disorder, aged 5 to 6, revealing a positive correlation between communication skills and joint attention, including its sub-dimensions. Additionally, the study found no gender-based differences in measures of joint attention across its facets and the ability to communicate with individuals diagnosed with autism spectrum disorder.

## Methodology

This research adopted an experimental approach, facilitating the examination of the impact of an independent variable (in this case, the joint attention program) on the dependent variable (communication skills). The study entailed the formation of an experimental group and a control group through random selection from the sample of children. Additionally, pre- and post-measurements were conducted. Firstly, two groups were established via random selection from the sample of children (n=22), delineating control and experimental groups. Secondly, demographic characteristics such as age, socioeconomic status, and language proficiency were assessed to ensure comparability between the groups. Thirdly, the control group was not exposed to the joint attention program, while the experimental group underwent the intervention. Fourthly, a second measurement was taken subsequent to the introduction of the independent variable, enabling comparison of outcomes between the control and experimental groups. Finally, the experimental group underwent retesting after approximately one month to confirm the

genuine improvement in communication skills, ruling out the possibility of chance effects.

### *Population and Sample*

The study's cohort consisted of children diagnosed with ASD who received treatment at the Centre for Autism in Jeddah between December 13, 2022, and February 2, 2023. Inclusion criteria were established to define eligible participants as follows: Firstly, children aged between six and fifteen years old were considered. Secondly, participants had to be free from any physical impairments, such as hearing loss, which could hinder their ability to respond or comprehend, as confirmed by medical records obtained from the Department of Health. Thirdly, children were required to have a normal intelligence quotient (IQ), as assessed by the Saudi version of the joint attention examination. Additionally, the results of this assessment indicated a deficiency in communication skills among the children.

From the pool of eligible children, a total of 24 participants were selected and evenly divided into two groups, each comprising 12 individuals. These groups consisted of an experimental group, randomly assigned to engage in the joint attention program developed for the study, and a control group, which did not participate in the joint attention program. The implementation of the joint attention program with the experimental group spanned two months, with a monthly allocation of 12 sessions per child, resulting in a total of 24 sessions per child throughout the intervention period.

### *Research Instrument*

The research utilized two key study instruments: a communication scale and a joint attention program. The communication scale, comprising 25 items, assessed both verbal and nonverbal skills of children with ASD at the beginning, middle, and end of the study. The joint attention program incorporated various behavioural and technical tools aimed at enhancing shared attention abilities through activities like improving matching skills, visual perception, and sign and visual communication skills. The program's procedural goals included providing exercises to enhance joint attention, employing behaviour modification techniques to encourage attention among autistic children, and facilitating interactions with them to mitigate language impairments.

### *Validity and Reliability of the Instrument*

Two methods were employed to validate the scale. Firstly, a panel of twelve arbitrators evaluated its content validity, achieving consensus with an 80% threshold. Secondly, discriminatory validity was assessed by administering the scale to twelve children with ASD, resulting in statistically significant (F) values of 8.75 and 11.65. The overall reliability was determined using Cronbach's alpha, yielding a coefficient of 0.875. Additionally, reliability coefficients for each dimension ranged from 0.785 to 0.862.

## **Data Analysis, Results and Discussion**

After data collection, mean test scores and standard deviations were computed for both pre- and post-tests. The effect size was assessed using Eta square to gauge the efficacy of the joint attention program in enhancing verbal proficiency among children with ASD. Furthermore, the Wilcoxon test and Z-value were employed to elucidate differences between



two comparable samples. Prior to commencing the joint attention program, it was ascertained that both the control and experimental groups exhibited comparable levels of proficiency in understanding and employing communication skills (refer to [Table 1](#) for specifics).

**Table 1**

*Pre-Measurement of Communication Skills*

Dimension	Group	N	Mean Rank	Sum of Ranks	U	Z	P
Verbal	Experimental	12	12.60	151.20	35.60	0.305	0.610
	Control	12	12.40	148.80			
Non-verbal	Experimental	12	13.45	161.40	29.50	0.980	0.340
	Control	12	11.55	138.60			
Total	Experimental	12	13.03	156.36	32.50	0.406	0.530
	Control	12	11.98	143.76			

[Table 1](#) indicates the absence of statistically significant differences between the experimental and control groups in terms of mean pre-test scores for children's communication skills.

Addressing the first research question, the study investigated the program's effects on both groups, as presented in [Table 2](#). The results suggest that following the implementation of the recommended program, the experimental group demonstrated improved performance compared to children with ASD in the control group. This outcome may be attributed to the early interventions targeting joint attention, which facilitate enhancements in cognitive and social capacities among these children. Previous research has highlighted the benefits of joint attention training in augmenting social interaction, communication, and linguistic skills. Hence, joint attention activities prove advantageous for autistic children, positively influencing their communication abilities.

Furthermore, the study observed instances where children with autism disorder exhibited inaccuracies in term usage and pronoun inversion while constructing sentences during training sessions. However, teaching joint attention skills led to a significant enhancement in their communication abilities. It is plausible that deficits in joint attention abilities correlate with communication challenges in autistic children, as joint attention serves as a fundamental component of communication. Therefore, effective communication relies on the establishment of joint attention during learning experiences, wherein a child absorbs a word through repetition while simultaneously attending to the instructor. This finding aligns with previous studies by [Manwaring and Stevens \(2017\)](#), [Sarra and Amine \(2018\)](#), and [Ali et al. \(2022\)](#).

**Table 2**

*Post-Measurement*

Dimensions	Group	N	Mean Rank	Sum of Ranks	U	Z	P
Verbal	Experimental	12	15.10	181.20	8.00	3.150	0.005
	Control	12	9.90	118.80			
Non-verbal	Experimental	12	15.20	182.40	6.00	3.655	0.000
	Control	12	9.80	117.60			
Total	Experimental	12	15.15	181.80	7.30	3.450	0.001
	Control	12	9.85	114.96			

To investigate the second research question, the study administered pre- and post-tests

to the experimental group, with the outcomes presented in Table 3. The results indicate significant differences in mean scores for verbal and nonverbal communication skills, as well as the overall score, between the pre- and post-tests of the experimental group, favouring the post-assessment. Following the intervention, children in the experimental group exhibited higher scores in communicative proficiency measures. Specifically, there was a notable increase in mean communication skills scale scores among children in the experimental group after their participation in the joint attention program. These findings align with previous studies by Manwaring and Stevens (2017), Sarra and Amine (2018), and Ali et al. (2022), highlighting the benefits of joint attention interventions for children with ASD.

**Table 3**

*Pre- and Post-Measurement*

Dimension	Pre/ Post	N	Mean Rank	Sum of Ranks	Z	P
Verbal	Negative score	2			3.5475	0.008
	Positive score	10	2.00	4.00		
	Ties	0	7.00	70.00		
	Total	12				
Non-verbal	Negative score	2			3.705	0.004
	Positive score	10	2.00	4.00		
	Ties	0	7.00	70.00		
	Total	12				
Total	Negative rank	2			3.550	0.006
	Positive rank	10	2.00	4.00		
	Ties	0	7.00	70.00		
	Total	12				

**Table 4**

*Post and Follow-up*

Dimension	Pre/ Post	N	Mean Rank	Sum of Ranks	Z	P
Verbal	Negative score	2			3.5475	0.008
	Positive score	10	2.00	4.00		
	Ties	0	7.00	70.00		
	Total	12				
Non-verbal	Negative score	2			3.705	0.004
	Positive score	10	2.00	4.00		
	Ties	0	7.00	70.00		
	Total	12				
Total	Negative score	2			3.550	0.006
	Positive score	10	2.00	4.00		
	Ties	0	7.00	70.00		
	Total	12				

To address the third research question, the study administered post-tests and follow-up assessments with the experimental group, as presented in Table 4. The findings from both the post-test and follow-up assessments corroborate each other, indicating the accuracy of the post-test results. This suggests that there has been no regression following

the program's conclusion, and the program's benefits have persisted during the follow-up period. The researcher attributes this to the quality of the programs provided to children with autism, which should encompass diverse activities. Instances where children demonstrated engagement in the curriculum activities were observed. The joint attention strategy employed in achieving the program's objectives proved to be highly effective in encouraging autistic children to communicate and utilize various methods to express their needs. Moreover, partial retraining and the use of corrective feedback will be implemented throughout program sessions to ensure that children in the experimental group are aware of instructional activities being conducted. Reinforcements will be consistently administered throughout each program session in accordance with established guidelines.

### **Conclusion**

This study posited that engagement in a joint attention program could potentially enhance the fundamental verbal and nonverbal communication skills of children with ASD. It further suggests that the joint attention program may yield more favourable outcomes compared to conventional approaches in improving both verbal and nonverbal communication abilities among these students. Consequently, instructors are advised to focus on enhancing the communication proficiencies of their pupils, encompassing both verbal and nonverbal aspects, to effectively meet program objectives. The research findings illustrated how involvement in the joint attention program could facilitate the development of verbal and nonverbal communication skills in autistic children. Notably, students were observed to engage in activities within the program curriculum, fostering mutual encouragement, support, and respect within a stress-free environment that promotes a calm demeanour.

### **Implications**

This study delved into the correlation between joint attention and the communication skills of children diagnosed with ASD. The literature highlighted the indispensable role of joint attention in the learning process and overall performance of autistic children, which is crucial for effective communication. It underscored the necessity of providing tailored attention to facilitate optimal learning experiences, thereby promoting their functional abilities. Additionally, the literature emphasized the importance of fostering a stress-free environment to bolster the capabilities of autistic children, enabling them to thrive in their educational endeavours. Consequently, creating conducive learning opportunities becomes imperative for fostering a deep understanding of the curriculum.

Moreover, the study offered practical insights into addressing the communication development of autistic children, emphasizing the significance of tailored approaches in their educational interventions. It stressed the essential need to enhance their learning experiences to drive meaningful performance outcomes. The study advocated for dedicated attention to the unique needs of autistic children, highlighting the importance of employing specialized strategies to effectively engage and motivate them. By implementing targeted efforts, their understanding can be significantly enriched, thereby enhancing their overall capabilities. Furthermore, collaborative efforts, coupled with encouragement, are deemed essential in facilitating the reliable performance of autistic children in their learning journey, underscoring the importance of both verbal and non-verbal communication in this process.

### Future Directions

The study explored the interconnection between joint attention and the communication abilities of children diagnosed with ASD. Additionally, it put forth recommendations for future research endeavours aimed at enriching the existing knowledge base. Scholars are encouraged to investigate the impact of parental supervision on both verbal and non-verbal communication skills among autistic children, thus offering valuable insights to the literature. Moreover, there is a need for studies to adopt interview-based observations as a reliable methodology to augment the understanding of this subject matter. Therefore, scholarly endeavours adhering to these suggestions hold promise for making substantial contributions to the academic discourse surrounding autism spectrum disorder.

### Acknowledgments

This work was funded by the University of Jeddah, Jeddah, Saudi Arabia, under grant NO (UJ-23-AKSPE-16). The authors, therefore, acknowledge with thanks the University of Jeddah for its technical and financial support.

### References

- Accardo, A. L., & Finnegan, E. G. (2019). Teaching reading comprehension to learners with autism spectrum disorder: Discrepancies between teacher and research-recommended practices. *Autism*, 23(1), 236-246. <https://doi.org/10.1177/1362361317730744>
- Akhmetzyanova, A. I., & Artemieva, T. V. (2020). The Relationship Between Prediction and Positive Socialization of Children With Developmental Disabilities. *Psychological Research*, 13(69), 5-15. <https://www.redalyc.org/journal/279/27962177031/27962177031.pdf>
- Ali, M. A. A. E. D., Shaheen, P., Saber, H., El-Behairy, P., & Rizk, M. (2022). Joint attention and its relationship to communication in children with autism spectrum disorder. *Educational Research and Innovation Journal*, 2(6), 33-55. <https://doi.org/10.21608/erji.2022.244373>
- Alokla, S. (2018). *Non-verbal communication skills of children with autism spectrum disorder* [Electronic Theses, Projects, and Dissertations, California State University, San Bernardino]. <https://scholarworks.lib.csusb.edu/etd/727>
- Antipova, J. A., & Miticheva, T. I. (2019). Study of the peculiarities of the formation and development of social and communication skills in preschoolers with autism spectrum disorder in the process of playing activity. *Young Scientist*, 48(286), 115-118.
- Belyaeva, O. L. (2020). Comparative study of the features of communication skills of older preschool children with ASD spectrum disorder of the second and third groups of autism. *Autism and Other Developmental Disabilities: Current Research and Development*, 1(4), 2-14. <https://doi.org/10.25146/2221-1160-2020-4-1-2-14>
- Bin Omar, M., & Kharoubi, A. (2019). Joint Attention in Verbal Children with Autism Spectrum. *Journal of Measurement and Psychological Studies*, 1(4), 25-34.
- Botha, M., Hanlon, J., & Williams, G. L. (2021). Does Language Matter? Identity-First Versus Person-First Language Use in Autism Research: A Response to Vivanti. *Journal of Autism and Developmental Disorders*, 53, 870-878. <https://doi.org/10.1007/s10803-020-04858-w>
- Brignell, A., Morgan, A. T., Woolfenden, S., Klopper, F., May, T., Sarkozy, V., & Williams, K. (2018). A systematic review and meta-analysis of the prognosis of language outcomes for individuals with autism spectrum disorder. *Autism & Developmental Language*

- Impairments*, 3, 2396941518767610. <https://doi.org/10.1177/2396941518767610>
- Cilia, F., Touchet, C., Vandromme, L., & Driant, B. L. (2020). Initiation and response of joint attention bids in autism spectrum disorder children depend on the visibility of the target. *Autism & Developmental Language Impairments*, 5, 2396941520950979. <https://doi.org/10.1177/2396941520950979>
- Colombo-Dougovito, A. M., & Block, M. E. (2019). Fundamental motor skill interventions for children and adolescents on the autism spectrum: A literature review. *Review Journal of Autism and Developmental Disorders*, 6, 159-171. <https://doi.org/10.1007/s40489-019-00161-2>
- Dyer, R. (2022). Successful Inclusion of Students with ASD. *International Journal of Technology and Inclusive Education*, 11(1), 1712-1716. <https://doi.org/10.20533/ijtie.2047.0533.2022.0211>
- Fahmy, A. (2022). The effectiveness of the Language and Teaching Skills Assessment Program (ABLIS-R) in improving some basic skills among different groups of children with developmental disorders. *Childhood and Education Journal (Alexandria University)*, 49(1), 385-428. [https://journals.ekb.eg/article\\_220472\\_7c483a6532ef498ec9484148de2bec5f.pdf](https://journals.ekb.eg/article_220472_7c483a6532ef498ec9484148de2bec5f.pdf)
- Franchini, M., Armstrong, V. L., Schaer, M., & Smith, I. M. (2019). Initiation of Joint Attention and Related Visual Attention Processes in Infants With Autism Spectrum Disorder: Literature Review. *Child Neuropsychology*, 25(3), 287-317. <https://doi.org/10.1080/09297049.2018.1490706>
- Hillier, A., Goldstein, J., Murphy, D., Trietsch, R., Keeves, J., Mendes, E., & Queenan, A. (2018). Supporting University Students With Autism Spectrum Disorder. *Autism*, 22(1), 20-28. <https://doi.org/10.1177/1362361317699584>
- Hollis, J. L., Sutherland, R., Williams, A. J., Campbell, E., Nathan, N., Wolfenden, L., Morgan, P. J., Lubans, D. R., Gillham, K., & Wiggers, J. (2017). A Systematic Review and Meta-analysis of Moderate-to-vigorous Physical Activity Levels in Secondary School Physical Education Lessons. *International Journal of Behavioral Nutrition and Physical Activity*, 14, 1-26. <https://doi.org/10.1186/s12966-017-0504-0>
- Holmes, S. C. (2022). Inclusion, Autism Spectrum, Students' Experiences. *International Journal of Developmental Disabilities*, 70(1), 1-15. <https://doi.org/10.1080/20473869.2022.2056403>
- Hwang, B. H., & Lee, D. (2022). Association between motor and language skills development in children with autism Spectrum disorder: a scoping review. *International Journal of Disability, Development and Education*, 1-15. <https://doi.org/10.1080/1034912x.2022.2092081>
- Koçak Uyaroğlu, A., Ertüzün, E., & Taş Arslan, F. (2021). The effect of the therapeutic recreation program for children with autistic spectrum disorder on their social skills. *Baltic Journal of Health and Physical Activity*, 13(7), 3. <https://doi.org/10.29359/bjhp.2021.suppl.2.03>
- Laribi, N. (2022). The effectiveness of a new treatment program based on the ABLIS-R in the Development of oral linguistic skills for children who suffer from Autism Spectrum Disorder. *Journal of Human Development and Education for Specialized Research*, 8(2), 66-97. [https://www.misd.tech/wp-content/files\\_mf/jhdesr/080203.pdf](https://www.misd.tech/wp-content/files_mf/jhdesr/080203.pdf)
- Liang, X., Li, R., Wong, S. H. S., Sum, R. K. W., & Sit, C. H. P. (2020). Accelerometer-measured physical activity levels in children and adolescents with autism spectrum disorder: A systematic review. *Preventive Medicine Reports*, 19, 101147. <https://doi.org/10.1016/j.pmedr.2020.101147>
- Licari, M. K., Alvares, G. A., Varcin, K., Evans, K. L., Cleary, D., Reid, S. L., Glasson, E. J.,

- Bebbington, K., Reynolds, J. E., & Wray, J. (2020). Prevalence of motor difficulties in autism spectrum disorder: Analysis of a population-based cohort. *Autism Research*, 13(2), 298-306. <https://doi.org/10.1002/aur.2230>
- Manis, H. C. (2019). *Relationship Between Joint Attention and Language in Multiparous and Uniparous Households* [Undergraduate Honors Theses, East Tennessee State University]. <https://dc.etsu.edu/asrf/2019/schedule/61>
- Manwaring, S. S., & Stevens, A. L. (2017). Does Teaching Joint Attention Improve Language in Children With Autism Spectrum Disorder? *Perspectives of the ASHA Special Interest Groups*, 2(1), 11-26. <https://doi.org/10.1044/persp2.sig1.11>
- Montagut-Asunción, M., Crespo-Martín, S., Pastor-Cerezuela, G., & D'Ocon-Giménez, A. (2022). Joint attention and its relationship with autism risk markers at 18 months of age. *Children*, 9(4), 556. <https://doi.org/10.3390/children9040556>
- Nyström, P., Thorup, E., Bölte, S., & Falck-Ytter, T. (2019). Joint Attention in Infancy and the Emergence of Autism. *Biological Psychiatry*, 86(8), 631-638. <https://doi.org/10.1016/j.biopsych.2019.05.006>
- Ruggeri, A., Dancel, A., Johnson, R., & Sargent, B. (2020). The effect of motor and physical activity intervention on motor outcomes of children with autism spectrum disorder: A systematic review. *Autism*, 24(3), 544-568. <https://doi.org/10.1177/1362361319885215>
- Sarra, H., & Amine, D. (2018). Joint Attention Training to Improve Verbal Communication Among Children of Autism Spectrum 8 Years. *Al-Jameh Journal of Psychological Studies and Educational Sciences*, 8, 89-102.
- Simón, C. M., ínez-Rico, G., McWilliam, R. A., & Cañadas, M. (2022). Attitudes Toward Inclusion and Benefits Perceived by Families in Schools with Students with ASDs. *Journal of Autism and Developmental Disorders*, 53, 2689-2702. <https://doi.org/10.1007/s10803-022-05491-5>
- Stark, M. D., & Lindo, E. J. (2022). Executive functioning supports for college students with an autism Spectrum disorder. *Review Journal of Autism and Developmental Disorders*, 10(4), 604-614. <https://doi.org/10.1007/s40489-022-00311-z>
- Thomas, S., Hinkley, T., Barnett, L., May, T., & Rinehart, N. (2019). Young children with ASD participate in the same level of physical activity as children without ASD: Implications for early intervention to maintain good health. *Journal of Autism and Developmental Disorders*, 49, 3278-3289. <https://doi.org/10.1007/s10803-019-04026-9>
- Van Tran, C., & Weiss, B. (2018). Characteristics of agencies providing support services for children with autism spectrum disorders in Vietnam. *International Journal of Social Science and Humanity: IJSSH*, 8(4), 116. <https://doi.org/10.18178/ijssh.2018.V8.946>
- Vanegas, S. B. (2019). Academic skills in children with autism spectrum disorders with monolingual or bilingual experience. *Autism & Developmental Language Impairments*, 4, 2396941519888170. <https://doi.org/10.1177/2396941519888170>
- von Below, R., Spaeth, E., & Horlin, C. (2021). Autism in Higher Education: Dissonance between educators' perceived knowledge and reported teaching behaviour. *International Journal of Inclusive Education*, 1-18. <https://doi.org/10.1080/13603116.2021.1988159>
- Zhao, M., & Chen, S. (2018). The effects of structured physical activity program on social interaction and communication for children with autism. *BioMed Research International*, 2018, 1825046. <https://doi.org/10.1155/2018/1825046>