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**THE EFFECTIVENESS OF A PROGRAM BASED ON SYMBOLIC COMMUNICATION  
IN IMPROVING NON-VERBAL COMMUNICATION SKILLS AMONG INDIVIDUALS  
WITH AUTISM SPECTRUM DISORDER IN JORDAN**

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**Abstract**

The study aimed to evaluate the effectiveness of a program based on symbolic communication in improving nonverbal communication skills among individuals with Autism Spectrum Disorder in Jordan.

The study sample consisted of (30) children with autism spectrum disorder between the ages of (3-7) years, at the Jordanian Center for Autism in Amman. To achieve the goal of the study, the scale of non-verbal communication skills prepared by the researchers was built, and the training program was built and the honesty and stability of them were verified. The results of the study showed that there were statistically significant differences between the average scores of the members of the experimental group and the average scores of the members of the control group on the scale of estimating non-verbal communication skills in the dimensional measurement in favor of the members of the experimental group. The study ended with recommendations relevant to the results.

**Key words:** Program Based on Symbolic Communication, Nonverbal Communication Skills, Individuals with Autism Spectrum Disorder Who Have an Intellectual Disability, Jordan.

**Introduction:**

Recently studies on the topic of autism spectrum disorder have increased, with many studies mentioning behavioral problems, as well as the symptoms that accompany individuals with autism spectrum disorder. The greatest interest in the programmes offered to this category has been in terms of verbal and non-verbal communication. We find that some individuals with disabilities have not developed the ability to communicate symbolically or spoken language skills, and the term symbolic communication is used AAC (Augmentative and alternative communication) in the absence of language or normal speech. This system is for the purposes of communicating meaning, and focuses on the use of sign language, communication books, printed or visible words, gestures, facial expressions and body or its position and other symbols such as the alphabet of the fingers, or technological tools such as devices to output multiple audio symbols (Zureikat, 2020).

Autism spectrum disorder is one of the most challenging disorders in everyday functional activities. The Diagnostic and Statistical Manual of Mental Disorders V (DSM5) indicates that this group suffers from a deficit in social communication, and shows patterns of repetitive behaviors that appear in the

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period of development and work to impair the daily functioning of these individuals (Bridgette, Tonnsen, Boan, Bradley and Amy, 2016).

Individuals with autism spectrum disorder (ASD) may have difficulty communicating with others, trying to communicate through their behaviors. For example, individuals with autism spectrum disorder may have difficulty telling their parents that they don't want to do an activity that parents want them to do, and then have a tantrum of frustration instead of using words. Children with autism spectrum disorder may have repetitive behaviors and may become very upset when there is a change in their routine, this can lead to abnormal behaviors (American Academy of Pediatrics, 2020).

Autism spectrum disorder affects a person's ability to communicate and understand social information, including understanding the intentions of others, knowing how to communicate with social situations, and repairing social interactions that have worsened. Difficulty in socializing can affect a person's ability to feel comfortable in social situations and cause social confusion and anxiety. Social anxiety makes it difficult for a person with autism spectrum disorder to cope with big emotions. Creating a visual system to work through difficult situations can be considered a very good approach because most people with autism spectrum disorder tend to learn more effectively through concrete, predictable systems (Buron, 2020).

Children and young people with autism spectrum disorder experience the world differently than others, some cannot easily communicate their needs which can lead to anxiety and frustration, and can lead to abnormal behaviors. Every behavior that happens for some reason, can help us try to understand why we develop strategies that will help overcome behavior that can have a negative impact on themselves and the people or environment around them (Ambitious About Autism, 2020).

Individuals with autism spectrum disorder are at risk in the absence of proper support and may worry, become passive, inactive, and stop acquiring activities. Supportive or alternative communication systems (AAC) are used with individuals who lack spoken language skills for the purposes of communicating meaning and use gestures, eye-gazing, body shape or posture, sign language, symbols, images, words, printed or visible. The goal is to enter symbols and complete the communication process through non-symbolic responses, such as eye gaze, body gestures, and facial expressions (Beukelman & Light, 2020). People with autism spectrum disorder also have communication problems and need to design educational programs to improve communication skills (Aubrey, Kim, Eric, & Justin, 2016).

Well-established treatments for autism spectrum disorder are non-pharmacological and may involve intensive individual interventions. Individuals with autism spectrum disorder typically benefit from behaviorally-oriented therapeutic programs and communication skills training developed specifically for this category (Brasic, Farhadi F, Elshourbagy, 2019).

**Study problem and questions:**

Special education teachers in centers face many problems in communicating with individuals with autism spectrum disorder, as autism spectrum disorder is classified as a social disability, and it is required to diagnose it that the individual faces challenges in social communication and interaction, and these challenges create undesirable reactive behaviors in individuals diagnosed with this disorder, for example; someone may scream or hit his head against the wall to express a need such as hunger, or bite himself (Grohol, 2020) People with autism spectrum disorder show various difficulties, perhaps the most prominent of which are poor communication and poor ability to interact socially, which call for therapeutic interventions. Most of the studies conducted have also focused on treating problems according to behavioral or social interventions and rarely involve symbolic communication. Individuals with autism spectrum disorder also have difficulty communicating and interacting socially, although various strategies are employed, they need training programs that reduce the severity of these difficulties. (Fusar-Poli, Brondino, Rocchetti, Panisi, Provenzani, Damiani & Politi, 2017). Given the importance of communication in children with autism in making it able to achieve adaptation in society and in the educational field and through the work of the researchers with this category of children, and what she observed of the effort and hardship of teachers with this category of children, and the curiosity of the parents of these children about how to communicate with them because this category suffers from a lack of verbal skills, hence the problem of the study in including symbolic communication in solving the problem (Weiss, Thomson, Riosa, Albaum, Chan, Maughan, Tablon, & Black, 2018).

As Lal's study (Lal, 2010) has pointed out, educating individuals with autism spectrum disorder is a difficult task for parents and teachers, as individuals show significant deficits in language and social behaviors. One of the main objectives of the programs offered to individuals with autism spectrum disorder is to provide them with a functional communication method and numerous opportunities to practice these skills. It may therefore be necessary to have a communication system that uses enhanced and alternative forms of expression.

In the study of Johanston, Evans & Joanne, 2004, they applied a visual communication program (symbols, images, drawings) to a group of children with autism spectrum disorder in preschool. The results showed the effectiveness of the use of the visual communication program in developing the ability of children to interact socially, to accomplish the tasks required of them, and to develop their verbal language by linking images to the extension of their linguistic mandates.

Hooper & Walker (2002) conducted a study to assess the work of 164 trainees of managers, teachers and speech therapists in 23 institutions in England, Scotland and Wales, all of which are involved in the Macton programme, to examine the impact of the Macton programme on them. In addition, information was obtained from all participants about how the program affected them, and what they believed contributed to its success or failure. 16 organizations reported that the scheme not only contributed to increased communication and interaction, but also led to increased self-esteem, confidence and increased interaction. Those organizations that stopped using Macton's software were the most common cause of the lack of staff.

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Therefore, the current study will try to exploit symbolic communication as a means of developing non-verbal communication skills in individuals with autism spectrum disorder in Jordan, hence the problem of the study can be summarized in the following question: What is the effectiveness of a program based on symbolic communication in the development of non-verbal communication skills in children with autism spectrum disorder in Jordan aged (3-7) years (attention, imitation, visual communication, use of signal, understanding some physical gestures and facial expressions)? From this key question emerge the following sub-questions:

**Study questions:**

First question: Are there statistically significant differences at the significance level ( $\alpha=0.05$ ) between the average scores of the members of the experimental group and the average scores of the members of the control group in dimensional performance on the scale of estimating non-verbal communication with its overall significance and subdimensions attributable to the symbolic communication program?

Second question: Are there statistically significant differences at a significance level of ( $\alpha=0.05$ ) between the average scores of the members of the experimental group in dimensional performance and follow-up performance on the scale of estimating non-verbal communication with its overall significance and subdimensions.

**Importance of the study:**

The importance of the current study is evident in two main aspects:

**Theoretical significance:**

- Directing therapeutic programs to include symbolic communication programs to develop non-verbal communication skills in children with autism spectrum disorder.
- Recognize the impact of the symbolic communication program on the development of non-verbal communication skills in children with autism spectrum disorder.

**Practical importance:**

- Building a program based on symbolic communication and investigating its effectiveness in the development of non-verbal communication skills in children with autism spectrum disorder.
- Build tools to measure non-verbal communication skills, and a program for symbolic communication and apply them with cases of people with autism spectrum disorder.

Objectives of the study:

**The current study includes the following objectives:**

- Testing the effectiveness of a program based on symbolic communication and investigating its effectiveness in the development of non-verbal communication skills in children with autism spectrum disorder.

- Development of non-verbal communication skills in children with autism spectrum disorder.

**Procedural definitions:**

In this study, special terms are included that are defined as follows:

**Symbolic communication:** is a program that focuses on the use of sign symbols, graphic communications, line graphics, tangible objects and gestures, and other symbols such as the alphabet of fingers (Zureikat, 2020). In this study, it is procedurally defined as a set of code-based procedures through activities through which individuals can increase communication skills and meet their communication needs through the use of signs, cards, or album visuals.

**Non-verbal communication skills:**

It is a set of skills that usually develops spontaneously during the developmental stages, a method by which others are read by understanding their body language such as the look of the eyes, body position, facial expressions, tone of voice and other forms of non-verbal communication and its expressive images that include all forms of communication other than speech (Hudry, McConachie, Le Couteur, Howlin, Barrett & Slonims, 2018) is procedurally defined as the score a child receives on the scale of estimating nonverbal communication skills in autistic children prepared for the purposes of the current study, and includes the following non-verbal communication skills:

**A) Attention:** It is a cognitive process that involves selectively focusing on a specific stimulus in the environment and ignoring other stimuli (Sheinkopf, 2005). It is defined procedurally as the ability of a child to focus his attention on the stimulus presented to him or her or the task required of him.

**B) Imitation:** It is the change in the behavior of an individual that results from observing the behavior of another individual (Lord, Risi, Lambrecht, Cook, Leventhal, DiLavore & Rutter, 2000) .It is defined procedurally as the ability of a child to repeat the behavior or movements presented to him/her.

**C) Visual communication:** Visual communication is a behavior that involves two people participating in staring at each other's eyes during the interaction period (Ames & Jarrold, 2007) It is defined procedurally as the ability of a child to look at the teacher or stimulus in front of him in a way that corresponds to the time period specified by the teacher.

**D) Use Pointing:** Use Pointing is an activity that involves awareness of other people's mental states in order to direct their attention to the things in our minds (Bell, 2003). It is defined procedurally as the child's ability to stretch a finger to indicate the stimulus offered to him by the teacher or to indicate what he wants and to express his needs and desires.

**E) Understanding Body Gestures and Facial Expressions:** is the ability to perceive, interpret and understand physical movements, facial expressions and tones of voice emanating from other people,

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including connotations and connotations, and respond to them in an appropriate way that contributes to making communication clearer, more accurate and credible (Febriantini, Fitriati & Oktaviani, 2021). and is procedurally defined as the child's ability to understand the emotional states presented to him by the teacher represented by the states of joy, sadness, laughter, crying and the tones of voice indicative of them in a way that contributes to the formation of relationships Be emotional with others, as well as understand some physical gestures such as peace and farewell movements and respond to them in a way that promotes social interaction.

**Autism spectrum disorder:** A developmental disorder that negatively affects communication and behavior and has a variable severity characterized by difficulties or a persistent deficit in social interaction, restricted interests and repetitive behaviors; the effects of the disorder and the severity of symptoms that negatively affect the ability of individuals to function properly in school, work and other areas of life vary from person to person, and the severity of the disorder ranges from mild to severe according to the need for support levels and is diagnosed during the early childhood period (from birth to eight years) (Zreikat, 2020).

**Children with autism spectrum disorder:** Procedurally they are those children who are diagnosed with autism spectrum disorder and receive special services according to the nature of their needs in specialized centers.

### **Study Limits and Determinants:**

#### **The current study is determined by the following limits:**

Human limits: The study sample members are represented (children with autism spectrum disorder).

Time limits: The application of this study was conducted during the second semester during the year 2021/2022.

Spatial boundaries: It is represented by the geographical area in which the autism centers in Jordan are located. (Jordan Autism Center) located in Amman.

#### **Determinants of the study:**

The period of time in which the program was applied and the extent to which it fits with the individual differences between students and is for the year 2021/2022. The study methodology used to answer the study questions is represented by the use of the semi-experimental approach. The study tool has connotations of its honesty and stability. The credibility of the accuracy of the diagnosis for the members of the study sample represented by (the first level in terms of the severity of the disorder).

#### **Theoretical framework and previous studies:**

Autism is the puzzle of the times, because of the ambiguity of this disorder, and the American physician Leo Kanner (1943) was the first to describe autism spectrum disorder where he drew his attention to the unusual behavioral patterns of eleven children who were classified as mentally

retarded, he noticed that these children are constantly immersed in a complete closure to the self, and distance from realism (Al-Subaie, 2019).

Leo Kanner provided a list of behavioral and psychological characteristics that would facilitate the identification of individuals with autism, and the list that Kanner has cited since 1943 is still true to this day, and the most important of which is the inability to socialize, language delays, the use of gestures in a non-communicative way after their development, the reversal of pronouns and playing in a strange, stereotypical and repetitive way (Al-Khatib, 2021).

About (70%) of people with autism spectrum disorder suffer from difficulties in learning, organization skills and in expressive language and employ them effectively, and the verbal skills of people with autism spectrum disorder vary as the most severe cases of them never speak and they are few, and we find those who speak use a few words, and may show tantrums, screaming, aggressiveness, crying, repetition style and self-harm, and rely on this as a way of communication, and it is difficult for them to understand the feelings, concerns or opinions of others, and do not understand that the person The other may not know the answer to a question they repeat and get very upset (Contaldo, Colombi, Pierotti, Masoni, Muratori, 2020).

Individuals with autism spectrum disorder who have a lack of verbal communication usually benefit from cognitive behavioral-oriented therapeutic programs that have been developed specifically for this category, and are considered to be established non-pharmacological treatments for autism spectrum disorder that may include intensive individual interventions, and individuals with autism spectrum disorder should be placed in these specialized programs as soon as the diagnosis is suspected, cognitive behavioral therapy and social skills training are useful for individuals with autism spectrum disorder who have deficiencies in the Verbal communication (Brasic et al. 2019). Enhanced and Alternative Communication (AAC) is a prominent component in the development of support services for individuals with disabilities, especially those with severe disabilities (Safira, Rangkuti, Rahmadsyah, Nasution, Ely, Harefa & Yulianus, 2020).

### **Characteristics of individuals with autism spectrum disorder:**

The category of individuals with autism spectrum disorder is seen as a group that is heterogeneous in its characteristics, two individuals with autism spectrum disorder may have the same diagnosis but their characteristics may vary and variety. Some individuals with autism spectrum disorder show complete isolation from the social environment and tend to be lonely while others show patterns of interaction, some develop verbal language skills well, while others do not develop such skills, although they often absorb the language around them more than they can express themselves, and may learn better if education is accompanied by images or the use of visual objects. They are also unable to make friends and personal relationships, have difficulty communicating with others in normal conversations, and learn social skills, and ways of interacting with the people around them that put them in a position that society accepts them. (Desideri, Roentgen, Hoogerwerf & de Witte, 2013) They show defiant behaviors including repetition (fluttering hands), self-harm (hitting the head with objects), aggression (beating) and stubbornness, it is difficult to know the reasons for these behaviors as research results have shown that the causes are most likely as a type of attempt to communicate or express a certain

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psychological condition such as sadness, anger, or the need for help or attention (O'Keeffe & McNally, 2021).

**Symbolic communication programs:**

It is one of the communication methods used by an individual to communicate messages to others, and to express his needs, desires and feelings without the use of verbal language (Safira et al., 2021). It is a set of methods and tools that are used with individuals who are unable to communicate with others in normal ways, and the American Speech-Language-Supporting Association has defined alternative and supportive communication as encompassing all types of non-verbal communication that are used to express thoughts, needs and desires, including what we use of facial expressions, gestures, symbols, images or writing (American Speech-Language-Hearing Association (ASHA), 2019).

Abstract symbols include hand gestures, gestures, finger spelling, and facial expressions. Unlike auxiliary symbols, abstract symbols require only the user's body to produce the desired communication (Laister, Stammer, Vivanti & Holzinger, 2021).

The importance of symbolic communication in individuals with autism spectrum disorder is highlighted in that it contributes to improving their communication. They have difficulties in the fields of expression, language and communication. Self-harm can be a way to express frustration, malaise, or anxiety about something, perhaps a change in routine or even a sense of anxiety or fear of where they are (Challenging Behavior, 2020). Children with autism spectrum disorder often find it difficult to recognize facial expressions and the emotions behind them and control their emotions, in these cases the use of emotion cards in the form of images of faces, whether real or cartoonish may be effective, which can be used to teach the child basic feelings, as well as Mindreading is a DVD that uses actors to show emotional expressions in faces and sounds, and social stories that explain the social attitudes of children and include how the child feels and how others feel may be Useful for children with autism spectrum disorder (Richdale, 2020).

**Previous studies**

This section presents previous studies relevant to the subject of the study problem and are organized according to their chronology:

The study of Carlop Christie, Carbenter, Leeblank, and Williblack (2002) also aimed to use the Image-Sharing Communication System (PECS) with children with autism spectrum disorder: assessing PECS acquisition, speech, social behavior, communication, and problematic behavior. The sample consisted of three children with autism spectrum disorder. The study found that all children reached the learning standards of PECS and showed an increase in verbal communication.

Johanston, Catherine & Joanne (2004) conducted a study aimed at using an early intervention strategy (preschool) with autistic children using a visual communication system (images, symbols, graphs and schematic) and to find out the extent to which the use of the visual communication system affects the ability of autistic children (study sample) to interact socially, and their behavior in accomplishing the tasks required of them. Opportunities for the child to communicate by looking with the eye towards the activity, using symbols and verbal language to participate in play with the group and ask to do a desired behavior. The results of the study showed the effectiveness of the use of the visual communication system in developing the ability of autistic children (the study sample) to interact socially, improving their ability to accomplish the tasks required of them, and developing verbal language by linking the image to its verbal connotation.

Reitman (2005) also conducted a study that aimed to study the effect of music therapy interventions on common attention in autistic children. The study sample consisted of (6) children with autism between the ages of (3-5) years. To achieve the purpose of the study, music was used as a tool for the study. The results of the study showed an improvement in social behaviors and an increase in co-attention behaviors in about 70% of the sample participating in the program.

The study of Bali & Lal (2007) also aimed to verify the effectiveness of the use of visual strategies in the development of communication skills in autistic children. The study sample consisted of (30) children of autism in the age group (5-10) years, divided into two groups (15 children in the experimental group and 15 children in the control group). In children with autism.

The Nunes & Hanline study (2007) aimed to investigate the effects of a parent's natural intervention on the communication skills of a 4-year-old child with autism spectrum disorder using the Supportive and Alternative Communication System (AAC). The child's mother was taught to use 4 natural teaching strategies that include a photo-communication system during a home routine. The circular was conducted to evaluate the use of intervention techniques and to generalize the results of the child's communication in two similar interactions. A design was used to assess the effects of the intervention, and the data indicated an increase in the frequency of response and imitation processes in the child and the use of the communication system. Chiang, Soong, Lin & Rogers (2008) conducted a study aimed at examining nonverbal communication skills in young autistic children. The study sample consisted of (32) children with autism, (22) males and one female, (32) children with developmental delay, (22) males and (11) females, the average age of children in each group (32.79) months, (22) normal children (10) males and (8) females between the ages of (18-20) months. To achieve the purpose of the study, the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV), the reducing measure of early social communication, and the criteria for the tenth International Classification of Diseases (.) were used. ICD-10 results have shown that children with autism from the age of (2-3) years show difficulties with joint attention and in the duration and frequency of communication and have a different non-verbal communication model compared to children in those younger than them in mental age in other groups.

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In the study of Ganz, Cook, Corbin-Corbin-Newsome, Bourgeois & Flores (2008) it aimed to study differences in the use of an alternative imaging communication system with a child with autism spectrum disorder and developmental delays. The sample consisted of one child with autism spectrum disorder with developmental delays, and the study showed a positive outcome.

Lal (2010) also conducted a study that illustrated the impact of using the Macton program on children with autism spectrum disorder to develop their language and social behavior. The sample consisted of (8) children between the ages of (9-12) years. Respondents received 12 language therapy sessions using the Macton program, and used (LATCA) as a tool to measure language in children, and the Social Behavior Scale (SBRs) as a tool to measure social skills.

Curtis' study (2012) which evaluates supportive and alternative communication methods (AAC) aimed at manual signaling, image sharing in teaching individuals with autism spectrum disorder (ASD) and intellectual disabilities (ID) to request basic needs, and addressed the question of whether the methodology of individual intervention will enable teachers to make the right decisions regarding the optimal way to communicate with students with ASD and mental disability. When requesting the basic needs of four children with ASD and/or ID, the results showed that the study only affected one participant as they showed higher autonomy using image sharing and better speech production using manual signals, but found that the ability to produce speech was a good indicator of social, mental and academic performance.

Owaijan (2012) conducted a study aimed at verifying the effectiveness of a training program to develop nonverbal communication skills in autistic children in Damascus city governorate. The study sample consisted of (20) children of autism, (16) males and (2) females, who were distributed into two experimental groups and included (10) children (8 males and 2 females), and a control group that included (10) children (8 males and 2 females) whose ages ranged between (3-6) years. To achieve the objectives of the study, the researcher prepared a list to estimate non-verbal communication skills, and built a training program to develop non-verbal communication skills in autistic children. The results of the study indicated the effectiveness of the training program prepared in the study in the development of non-verbal communication skills in children with autism, and the results of the study indicated the effectiveness of the program in the development of non-verbal communication skills.

Delshad (2012) also conducted a study aimed at verifying the effectiveness of a training program to develop social communication skills in a sample of autistic children in Damascus. The study sample consisted of (12) children and girls, and they were divided into two experimental and control groups, where each group consisted of (6) children. To achieve the objective of the study, the Autistic Behavior Estimation Scale (CARS), the Verbal Communication Skills Estimation Scale in Autistic Children (Researcher Preparation), the Training Program (Researcher's Preparation), and the Adaptive Behavior Scale were used. The results of the study showed that there were statistically significant differences in

the average scores of the members of the experimental and control groups on the scale of estimating social communication skills in all its dimensions attributed to the training program, and in favor of the experimental group.

Walton & Ingersoll (2013) was interested in improving the social skills of individuals with autism spectrum disorder (ASD). Several social skills interventions that may improve social skills have been described with this category, including video modeling, developmental educational interventions, and behavioral and peer-mediated organizational interventions. However, significant challenges exist in research design and methodology across these studies. This paper reviews research that examines social skills interventions for young people with autism spectrum disorder and points to the weaknesses and challenges of this literature.

The study of Wilkinson & McIlvane (2013) aimed to uncover how cognitive factors affect the visual search for meaningful symbols in children with mental disabilities, Down syndrome and autism spectrum disorder. The sample consisted of twelve children, all with a mental disability, half with Down syndrome and the other half with autism spectrum disorder. The study found that visual research is faster in people with autism spectrum disorder and that grouping symbols by color accelerates search.

A study of Liu, Wong, Chung, Kwok, Lam, Yuen, Arblaster & Kwan (2013) explored the effectiveness of a workplace training program aimed at promoting work-related behaviors in individuals with autism spectrum disorder and mental disabilities. Fourteen participants were recruited with autism and mild to moderate mental disability (life expectancy = 24.6 years). The workplace-training program included practices in the context of work and group educational sessions. The post-test pre-test design with a work personality profile, a revised independent behavior scale and a revised observed emotional inventory were used to assess targeted behaviors. Improvements in workplace-specific social and communication skills have been achieved. In order to control emotions, participants became less confused and had a better self-concept. However, improvements in other general emotional behaviors such as emotion control have been limited. The results indicated that a structured workplace-training program aimed at improving social, communicative, and emotional behaviors could be beneficial for people with autism spectrum disorder and mental disability.

A study of Ingersoll, Walton, Carlsen & Hamlin (2013) examined social interventions for individuals with autism spectrum disorder. Previous research suggests that reciprocal imitation training (RIT) improves imitation and social engagement in young children with autism spectrum disorder. This study used a multi-basis design to examine whether RIT could improve social behaviors in four children with autism spectrum disorder. All the children improved their spontaneous tradition and two improved their joint participation. In addition, two children reduced the rate of self-stimulation behaviors during treatment. Overall, these results suggest that RIT may be effective in improving social interaction and reducing stereotypical behaviors in children with autism spectrum disorder.

In a study by Hutchins & Prelock, 2014, which aimed to uncover the effectiveness of using communication to reduce challenging behaviors in individuals with autism spectrum disorders. The sample consisted of one child with autism spectrum disorder. The study significantly affected the child and found that structured and personal communication can solve communication problems in people with autism spectrum disorder.

In a study of Sigafoos, O'Reilly, Lancioni, Sutherland (2014) aimed to study supportive and alternative communication for individuals with autism spectrum disorder and mental disability. I reviewed two directions in AAC research and found that modern devices are effective and that individuals can learn to use them quickly.

A study (Plavnick, Kaid & MacFarland, 2015) indicated that social disability is a key feature of individuals with autism spectrum disorders and associated mental disabilities (ASD-ID). Although these deficiencies persist in adolescence, few social skills interventions have been empirically evaluated for older individuals with ASD-ID. The current investigation adapted an effective protocol for adolescents with ASD, video-based group education (VGI), and expanded the procedure to include 4 adolescents in a public high school environment. A multiple investigation across behavior design showed effectiveness (VGI) in teaching new social behavior to three of the four participants, with mixed results for the fourth participant. Long-term results were observed for two participants although the results of the generalization were mixed. The findings support the use of VGI in the secondary school curriculum for some adolescents with ASD-ID.

The study of Hui et al. (2016) carried out a modified educational interaction to teach social skills to four children with autism spectrum disorder. A multi-core design was used across social skills and replicated across participants to assess the effects of conducting a modified teaching interaction. The results showed that conducting the teaching interaction led to all participants acquiring the targeted social skills, maintaining the targeted social skills, and generalizing the targeted social skills.

A Gilson & Carter study (2016) noted that employment for young people with autism spectrum disorder or mental disability (ID) lags far behind their non-disabled counterparts. Most post-secondary education programs for students with disabilities include internship experiences to enhance employability skills. However, the proximity of job coaches may inadvertently hinder social opportunities and independence. A multi-investigation and single-case experimental design across three university students with autism or mental disabilities was used to examine the effects of the training package on participation in tasks and social interactions. For all participants, interactions and keeping involved in tasks increased when trainers reduced assistance and accomplished tasks discreetly through devices placed in the ear. Participants considered the intervention to be beneficial.

A study of Walsh, Holloway & Lydon (2018) evaluated the effectiveness of the Lauker's Social Skills Curriculum: ACCESS and Video Modeling Program to Increase Social Communication Skills. Participants attended two courses (3 hours) a week over a 20-week period. A multi-metrical design was used to demonstrate the results of social skills across three broad methodological areas (e.g., peer-related, adult-related, and self-related social skills). Standardized assessments were also conducted before and after the intervention. The results showed a significant increase in targeted social skills and a marked decrease in challenging behaviors after the intervention.

A study of Stauch, Plavnick, Sankar & Gallagher (2018) evaluated the effects of video-based group learning (VGI) on the acquisition of social cognition skills of five children with autism spectrum disorder in a public school environment. Social cognition involves observing the emotional behaviors of others, distinguishing between relevant environmental stimuli, and promoting someone else's emotional behavior differently. When VGI was applied, peers provided support as social partners to the participating sample. The design of multiple metrics across behaviors has shown the effectiveness of VGI to teach social cognition skills. Four out of five participants acquired and maintained targeted social perception skills. The results of this study indicated that VGI may support the acquisition of social cognition among children with ASD.

The study of Siu, Lin & Chung, (2019) evaluated the application and effectiveness of TEACCH's approach in teaching job skills to young people with autism spectrum disorder with mild to moderate mental disabilities. An experimental design was used comparing the achievement of the training objective of an experimental group ( $n = 32$ ) with a comparison ( $n = 31$ ). The TEACCH Transitional Assessment Profile (TTAP) was organized to identify appropriate training areas and three individual training objectives were identified for each participant using the Goal Achievement Scale (GAS) methodology. The pilot group participated in an individual unified training program consisting of 20 sessions based on the TEACCH approach, in addition to their regular training in the centers of daily activities. The results indicated that all participants showed improvement in job skills on baseline, program average, and post-program evaluations ( $F = 146.66$ ,  $p < .001$ ). The experimental group had a much greater improvement in GAS scores than the comparison group ( $F = 15.40$ ,  $p < .001$ ). There were no significant changes between TTAP scores before and after the program for both groups. TEACCH's approach is effective in teaching specific functional skills to young people with autism spectrum disorder and mild to moderate mental disabilities.

### **Comment on previous studies:**

Previous studies have pointed to the importance of symbolic communication programs in developing nonverbal communication skills and improving social interaction in individuals with autism spectrum disorder which helps in achieving adaptation to the requirements of daily life. Studies have also shown the importance of this type of program in the development of the abilities of children with autism spectrum disorder, and the studies were similar in the number of sample members, most of which were within small size samples, and the sample in some studies was limited to one child and this was followed in the current study,

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Most studies agree on a semi-experimental approach to verify the effectiveness of behavioral training programs to develop nonverbal communication skills through the use of behavior modification techniques (indoctrination, reinforcement, practice, modeling), and notes the lack of studies that have dealt with symbolic communication programs in the training of people with autism spectrum disorder. While the current study was unique from previous studies that were presented through the diversity of techniques used (indoctrination, reinforcement, modeling, practice, feedback through repetition and generalization techniques) in the sessions of the training program based on symbolic communication in the development of non-verbal communication skills in individuals with autism spectrum disorder in Jordan.

### **Method and procedures**

This part of the study deals with the methodology followed in the study; a description of the members of the study community and its sample, the study tool, methods for verifying its truthfulness and stability, study variables, and statistical processing.

### **The study methodology**

to achieve the objectives of the study was used semi-experimental approach, as the design of the study includes the use of the two groups (experimental and control), with the pre- and post-application of the scale to the two groups, and this approach is the most appropriate for such purposes of this study, and the sequential application of the scale was used on the members of the experimental group to ensure the impact of the effectiveness of the program over time.

### **The study sample**

consisted of (30) children with autism spectrum disorder between the ages of (3-7) years, at the Jordanian Center for Autism in Amman, who were selected in a deliberate way, where individuals were assigned by the simple random method to two groups: an experimental group and the number of its members (15) children applied to them a program based on symbolic communication, and a control group of (15) children who did not undergo the program.

### **Study tool**

by reference to theoretical literature and previous relevant studies as a study (Johanston, Catherine & Joanne, 2004; Ingersoll, Walton, Carlsen & Hamlin, 2013; Wilkinson & McIlvane, 2013; (Stauch, Plavnick, Sankar & Gallagher, 2018) The scale of estimating nonverbal communication skills in individuals with autism spectrum disorder was used, as the scale was in the form of a questionnaire, where the scale consisted of (31) paragraphs distributed over six dimensions (attention, imitation, visual communication, use of signal, understanding of some physical gestures and facial expressions, and social skills) in addition to demographic variables.

## Authenticity of the study scale

### A) Authenticity of the content of the study scale

In order to verify the authenticity of the apparent content of the study scale, the researchers presented it to a group of arbitrators from Jordanian universities with experience in educational colleges, in order to identify the suitability of the paragraphs for the scale, the integrity of their wording, and the clarity of their meanings from a linguistic point of view, and all the observations of the arbitrators were adopted; where the linguistic formulation of the paragraphs unanimously agreed upon by approximately (80%) was modified as a minimum agreed upon by the arbitrators as a criterion for judging their validity.

### B) Authenticity of the construction of the study scale

In order to verify the sincerity of the construction and to identify the sincerity of the internal consistency of the study scale and the extent to which the constituent paragraphs contribute to it, the Pearson correlation coefficients were calculated between the paragraphs of the study scale with the total degree of dimension belonging to it, and Table (1) shows this:

**Table (1) Correlation coefficients between the paragraphs of the scale and the total degree of the dimension to which it belongs**

social skills	Understanding Body Gestures and Facial Expressions	Use Pointing	Visual communication	Imitation	Attention	Dimensions
correlation coefficient	correlation coefficient	correlation coefficient	correlation coefficient	correlation coefficient	correlation coefficient	paragraph number
**0.666	**0.642	**0.643	**0.694	**0.750	**0.800	1
**0.599	**0.711	**0.714	**0.816	**0.798	**0.839	2
**0.667	**0.689	**0.655	**0.716	**0.779	**0.781	3
**0.711	**0.613	**0.744	**0.639	**0.809	**0.798	4
**0.703	**0.652	**0.690	**0.777		**0.763	5
**0.749	**0.756					6

Table (1) shows that the values of the correlation coefficients of paragraphs at the distance of attention ranged between (0.763 – 0.839). It also shows that the values of the coefficients of the correlation of paragraphs at the distance of tradition ranged between (0.809 – 0.750). The values of the correlation coefficients of the paragraphs at the eye contact dimension ranged between (0.639-0.816). It shows that the values of the correlation coefficients of the paragraphs at the distance of using the signal ranged between (0.643 – 0.744). It also shows that the values of the correlation coefficients of the vertebrae at the distance of understanding some physical gestures and facial expressions ranged between (0.613 – 0.756). The values of the correlation coefficients of paragraphs at the social skills dimension ranged

from (0.599 – 0.749). All of these values were high and statistically significant at the significance level ( $0.05 = \alpha$ ). This indicates a degree of sincerity of internal consistency in the dimensional paragraphs.

**Table (2) Correlation coefficients between the dimensions and the total score of the scale**

Total marks	Dimensions
**0.785	Attention
**0.833	Imitation
**0.803	Visual communication
**0.839	Use Pointing
**0.876	Understanding Body Gestures and Facial Expressions
**0.793	social skills

Table (2) indicates the values of the correlation coefficients between the dimensions and the total score of the study scale, where the values ranged between (0.785 – 0.876) and were all high and statistically significant at the level of significance ( $0.05 = \alpha$ ). This means that there is a high degree of sincerity of internal consistency between the dimensions and the overall degree on the scale.

Stability of the study scale:

To verify the stability of the study instrument, the method of internal consistency was applied using the Cronbach's Alpha equation, where the scale was applied to the target study sample, and table (3) shows this

**Table (3) Values of the Coefficients of Internal Consistency Cronbach Alpha**

number of paragraphs	Cronbach Alpha	Dimensions	#
5	0.811	Attention	
4	0.798	Imitation	
5	0.806	Visual communication	
5	0.821	Use Pointing	
6	0.833	Understanding Body Gestures and Facial Expressions	
6	0.824	social skills	
31	0.886	the scale as a whole	

It is noted from the table that the values of the coefficients of internal consistency stability according to the Cronbach alpha equation ranged from dimensions (0.798-0.833). The value of Cronbach's alpha stability coefficient for the vertebrae of the scale as a whole was (0.886) .

#### **Study Design:**

The design of equal groups (before-after) was used, so the design of the study is as follows:

EG:  $O_1 \times O_2 O_3$

O<sub>2</sub> O<sub>3</sub> O<sub>1</sub> - CG:

EG refers to the experimental group, CG to the control group, (O1) to the pre-scale application, (O2) to the dimensional application of the scale, (O3) to the follow-up application of the scale, and (×) to the experimental process.

### Study variables

**Independent variable:** The program is based on symbolic communication.

**Dependent variable:** Nonverbal communication skills in individuals with autism spectrum disorder who have a mental disability in Jordan.

### Statistical processing

To answer the hypothesis of the first study, arithmetic averages, standard deviations and adjusted arithmetic averages were extracted, and multiple concomitant variance analysis (MANCOVA) as well as effect size extraction were used to reveal the effectiveness of a program based on symbolic communication in developing nonverbal communication skills in individuals with autism spectrum disorder who have a mental disability in Jordan. To answer the hypothesis of the first study, the Paired Samples Test was used to show the statistical differences between the arithmetic averages on the responses of the experimental group members in the dimensional and sequential application of the scale. The Cronbach-alpha equation was also used to find the coefficient of internal consistency, as well as the Pearson correlation coefficient to verify the sincerity of the construction. The five-step Likert scale was adopted, with each of its paragraphs given one out of its five scores (very large, large, medium, weak, very weak), and represented numerically (5, 4, 3, 2, 1) respectively.

### The results of the study

To achieve the objectives of the study were used the required statistical analyses and the results of the hypotheses were as follows:

**First, the first hypothesis, which states:** "There are no statistically significant differences at the level of significance ( $0.05 = \alpha$ ) between the average scores of the members of the experimental group and the average scores of the members of the control group in dimensional performance on the scale of estimating non-verbal communication in its overall significance and subdimensions attributable to the symbolic communication program"?

To answer the first hypothesis, the values of arithmetic averages, standard deviations, adjusted arithmetic averages and standard errors were extracted on the scores of the members of the experimental and control groups of the scale of estimating non-verbal communication with its overall significance and subdimensions in the pre- and post-applications, and Table (4) shows this:

#### Table (4)

Arithmetic averages, standard deviations, adjusted averages and standard errors of the scores of study subjects on the total score of the non-verbal communication estimation scale and their dimensions for the pre- and post-application in the two groups

standards errors	Adjusted arithmetic averages	post test		pretest		the group	dependent variable
		standard deviation	Arithmetic averages	standard deviation	Arithmetic averages		
.139	2.33	0.49	2.33	0.50	2.15	control	Attention
.139	3.56	0.58	3.56	0.32	2.13	experimental	
.133	2.13	0.61	2.13	0.57	1.90	control	Imitation
.133	3.57	0.39	3.57	0.50	1.90	experimental	
.099	2.36	0.40	2.36	0.26	2.08	control	Visual communication
.099	3.65	0.37	3.65	0.27	2.16	experimental	
.126	2.64	0.47	2.64	0.36	2.48	control	Use Pointing
.126	3.81	0.50	3.81	0.47	2.55	experimental	
.114	2.14	0.42	2.14	0.34	2.01	control	Understanding Body Gestures and Facial
.114	3.48	0.47	3.48	0.42	1.98	experimental	
.108	2.24	0.40	2.24	0.26	2.16	control	social skills
.108	3.61	0.43	3.61	0.28	2.10	experimental	
.091	2.31	0.35	2.31	0.22	2.13	control	the scale as a whole
.091	3.61	0.35	3.61	0.22	2.14	experimental	

Table 4 indicates that there are apparent differences between the arithmetic averages of the experimental and control groups on the pre- and post-application of each dimension of the non-verbal communication estimation scale and the overall score. To show the significance of the statistical differences between the averages, the Dependent Multivariate Associated Variance Analysis (MANCOVA) test was used, depending on the difference of the group, and Table 5 shows the results: Table (5) Results of the multiple accompanying variance analysis (MANCOVA) for individuals' performance on each dimension of the non-verbal communication skills assessment scale and the total score in the post-application attributed to the group

Impact size( $\eta^2$ )	Indication level	Test value )F(	mean squares	Degrees of freedom	Sum of squares	Dependent variable	Contrast sources
.583	.000*	39.159	11.285	1	11.285	Dimensional attention	
.675	.000*	58.171	15.408	1	15.408	Dimensional imitation	
.752	.000*	84.985	12.545	1	12.545	Dimensional visual communication	
.607	.000*	43.194	10.325	1	10.325	Use of dimensional signal	the group Hotelling's = 5.11
.709	.000*	68.062	13.333	1	13.333	Understand some physical gestures and dimensional facial expressions	F = 19.594 Sig = 0.000
.740	.000*	79.746	14.008	1	14.008	Dimensional social skills	
.786	.000*	102.539	12.738	1	12.738	dimensional total score	
			.288	28	8.069	Dimensional attention	
			.265	28	7.417	Dimensional imitation	
			.148	28	4.133	Dimensional visual communication	
			.239	28	6.693	Use of dimensional signal	
			.196	28	5.485	Understand some physical gestures and dimensional facial expressions	The error
			.176	28	4.919	Dimensional social skills	
			.124	28	3.478	dimensional total score	
				30	279.840	Dimensional attention	Total

30	266.500	Dimensional imitation	
30	287.880	Dimensional visual communication	
30	329.360	Use of dimensional signal	
30	255.889	Understand some physical gestures and dimensional facial expressions	
30	276.083	Dimensional social skills	
30	278.912	dimensional total score	
29	19.355	Dimensional attention	
29	22.825	Dimensional imitation	
29	16.679	Dimensional visual communication	
29	17.019	Use of dimensional signal	
29	18.819	Understand some physical gestures and dimensional facial expressions	Average total
29	18.927	Dimensional social skills	
29	16.216	dimensional total score	

\*Statistically significant at ( $\alpha = 0.05$ )

It is noted from the results of Table (5) that there are statistically significant differences at the level of significance ( $\alpha=0.05$ ) between the arithmetic averages of the dimensional application to all dimensions of the scale of estimating non-verbal communication skills attributed to the group, where the values on the test (F) for dimensions were statistically significant at ( $\alpha=0.05$ ). Through the adjusted arithmetic mean values referred to in Table 4, the arithmetic mean of the members of the experimental group was higher than the arithmetic mean of the members of the control group on all dimensions, which means that the experimental group possessed a better level of dimensions of non-verbal communication skills

after being trained in the symbolic communication program compared to the control group. It is noted from the results of Table (5) that the value of the ETA square at the distance of attention was (0.583), i.e. (58.3%) of the variation in attention lies in its interpretation through the symbolic communication program. The value of the ETA square at the distance of tradition was (0.675), i.e. (67.5%) of the variation in tradition lies in its interpretation through the symbolic communication program. The value of the ETA square at the distance of visual communication was (0.752), i.e. (75.2%) of the variation in visual communication lies in its interpretation through the symbolic communication program. The value of the ETA square at the distance of using the signal was (0.607), i.e. (60.7%) of the variation in the use of the signal lies in its interpretation through the symbolic communication program. As for the value of the ETA square at a distance of understanding some physical gestures and facial expressions amounted to (0.709), that is, (70.9%) of the variation in the understanding of some physical gestures and facial expressions lies in its interpretation through the symbolic communication program. As for the value of the ETA square at the social skills dimension (0.740), that is, (74%) of the variation in social skills lies explained by the symbolic communication program.

It is also noted from the results of the table that there are statistically significant differences at the level of significance ( $\alpha=0.05$ ) in the arithmetic averages of the dimensional application to the total score of the measure of estimating non-verbal communication skills attributed to the group, where the value of the test (F) on the total score of the scale (102.539) and the level of significance (0.000) and this value is a statistically significant function at ( $\alpha=0.05$ ). Through the adjusted arithmetic mean values referred to in Table 4, the value of the arithmetic mean of the members of the experimental group on the scale was (3.61) while the arithmetic average of the control group members was (2.31), which means that the experimental group had a better level of non-verbal communication skills compared to the control group after being trained in the symbolic communication program. The value of the ETA square came on the scale as a whole (0.786), meaning that (78.6%) of the variation in nonverbal communication skills as a whole in individuals with autism spectrum disorder who have a mental disability in Jordan lies explained through the symbolic communication program.

**Second: The second hypothesis, which states:** "There are no statistically significant differences at the level of significance ( $0.05 = \alpha$ ) between the average scores of the members of the experimental group in dimensional performance and follow-up performance on the scale of estimating non-verbal communication skills in its overall significance and subdimensions"

To answer the second hypothesis, the values of arithmetic averages and standard deviations were extracted for the responses of the members of the experimental group to the dimensional and sequential measurement of the scale of estimating non-verbal communication skills, and to show the statistical differences between the arithmetic averages, a test (t) was used for paired samples test, as shown in Table (6).

**Table (6) Arithmetic Averages, Standard Deviations and "T" Test of Correlated Samples on the Responses of Experimental Group Members to Dimensional Measurement and Follow-up to the Non-Verbal Communication Skills Estimation Scale**

Indication level	degrees of freedom	Values "t"	average difference	standard deviation	Arithmetic mean	practical	Scale dimensions
.873	13	0.163	0.014	0.66	3.53	dimensional	Attention
				0.50	3.54	Follow-up	
.336	13	1.000	0.125	0.69	3.45	dimensional	imitation
				0.41	3.57	Follow-up	
.504	13	0.687	0.071	0.53	3.59	dimensional	visual communication
				0.32	3.66	Follow-up	
.322	13	1.086	0.085	0.60	3.77	dimensional	Use of signal
				0.49	3.86	Follow-up	
.236	13	1.123	0.107	0.62	3.37	dimensional	Understand some physical gestures and facial expressions
				0.48	3.48	Follow-up	
.142	13	1.369	0.131	0.62	3.48	dimensional	social skills
				0.45	3.61	Follow-up	
.408	13	0.855	0.089	0.54	3.53	dimensional	the scale as a whole
				0.34	3.62	Follow-up	

Table 6 shows that there are no statistically significant differences at the significance level ( $\alpha=0.05$ ) between the arithmetic averages in the responses of the experimental group members to the two dimensional applications and follow-up on all dimensions of the scale. The statistical values of the (t) test on non-statistically significant dimensions were at the significance level ( $\alpha=0.05$ ).

The table shows that there are no statistically significant differences at the significance level ( $\alpha=0.05$ ) between the average responses of the group members to the total score of the scale in the dimensional and follow-up applications, where the statistical value of the test (t) on the total score of the scale (0.855) at the level of significance (0.408), and this value is considered statistically insignificant at the level of significance ( $\alpha=0.05$ ).

### **Discussion of the results of the study and recommendations**

This section presents the discussion of the results of the study and is organized according to its questions:

**Discussion of the first question: Are there statistically significant differences at the level of significance ( $\alpha=0.05$ ) between the average scores of the members of the experimental group and the average scores of the members of the control group in dimensional performance on the scale of estimating verbal communication with its overall significance and subdimensions attributable to the symbolic communication program?**

The results of the study showed that there were statistically significant differences between the average scores of the members of the experimental group and the average scores of the members of the control group on the scale of estimating non-verbal communication skills in the dimensional measurement in favor of the members of the experimental group. The results of the first hypothesis can be explained by the fact that the members of the experimental group were subjected to a behavioral training program to develop non-verbal communication skills (attention, imitation, visual communication, use of signal, understanding some physical gestures and facial expressions), based on a number of behavior modification techniques (imitation - indoctrination - reinforcement) that proved effective in teaching new behaviors, while the control group did not undergo the behavioral training program prepared by the researchers, (subject to the program prepared at the center). Given the homogeneity and equivalence of the two groups (experimental group and control group) and the absence of differences between them in pre-measurement in non-verbal communication skills, we can attribute the improvement in the scores of members of the experimental group in telemetry to the effect of the program.

The results of this hypothesis are consistent with Sorya, Arnstein, Gillis, & Romanczyk, 2003) that children with autism show a marked improvement in communication if they undergo training, they face difficulties in learning by observation, so they need to learn directly, shape their response, and provide appropriate reinforcement so that they can acquire any new skill. This was taken into account in the training of members of the pilot group in the proposed training programme

It is therefore important to train children with autism in social, emotional and communicative skills to help them perceive and interact with the social situation acceptably (Habib, 2016). From the above we conclude that autistic children have obvious difficulties in expressing their feelings represented by the inability to show appropriate facial expressions to their emotional states, and even those who show some facial expressions are not suitable for the emotional state of the child or for the interactive situation between the child and others (Anan & Turkington, 2007) so it is important to train children with different skills through a consistent organized early intervention program, and this is what the researchers worked on when selecting the sample of study subjects in the category Age (3-6) years of autistic children.

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The nature of the activities (mental, artistic, musical, and games) included in the program had an impact on the effectiveness of the program, as agreed by the study (Al-Balawi, 2011), the study of Smith (Smith, the study (Riahi and Zubairi, 2017) and the study of Watkins, O'Reill & Kuhn, 2015).

The result of the first hypothesis was consistent with the results of some studies that found the effectiveness of training programs in improving non-verbal communication in autistic children such as a study (Owaijan, 2012), a study (Amin, 2008), a study (Khattab, 2005), and a study (Bondy & Lori, 2002), all of which indicated that there were statistically significant differences between the average scores of the members of the experimental group and the averages of the scores of the members of the control group on the scale of estimating non-verbal communication skills in autistic children, after the application of a training program to develop communication skills. The results of the Gilson and Carter study, 2016, which showed the importance of training in the development of internship experiences to enhance skills and develop participation in tasks and social interactions.

The results of the study of Walsh et al. (2018) showed that training led to significant increases in targeted social skills and a marked decrease in formed behaviors after intervention.

The results of the Stauch et al. study (2018) that illustrated the effects of video-based group learning (VGI) on the acquisition of social cognition skills of five adolescents with ASD or ID in a public school environment. The results of Curtis' study (Curtis, 2012) aimed to determine the optimal communication method for students with autism spectrum disorder and mental disability.

**Discussion of the second question - Are there statistically significant differences at the level of significance (0.05 ( $\alpha$ ) between the average scores of the members of the experimental group in dimensional performance and follow-up performance on the scale of estimating verbal communication with its overall significance and subdimensions?**

The results of the statistical analysis showed that there were no statistically significant differences between the dimensional measurement and the traceability measurement of the study sample members (experimental group) on the scale of estimating non-verbal communication skills.

The reason for the continuity of the effectiveness of the program followed in this study is attributed to the accuracy of the steps and the effectiveness of the techniques used in the implementation of the program used in the implementation of the program, where it was initially relied on imitation with a focus on reinforcement and indoctrination continuously, then the program ended with a final withdrawal of indoctrination, and mitigation of boosters, and the continuity of the impact of the program is also due to the strategy of the program that is based on the repetition of the session by the teacher and the circulation of instructions in (dining room, garden, games room....) which helped children to circulate the instructions In different places it has led to the transmission of the impact of learning in multiple locations which has helped to sustain the impact of the program.

With reference to the positive and supportive role of parents in the stages of application of the program and after it by adhering to what the researchers provided during the training period and following it up

at home to benefit from the abilities of their children to the maximum extent possible, and this is what studies have agreed on that emphasize the importance of involving parents in the training programs for their children such as a study (Al-Khairan, 2011), a study (Ghazal, 2007), and a study of Sheikh Theeb (2004).

**In light of the results, the researchers recommends the following:**

Apply the program to a wider sample and other age groups.

Train teachers on symbolic communication procedures to use with people with autism spectrum disorder.

Design special programs and metrics to be applied with people with autism spectrum disorder.

**References**

- Al-Balawi, Nadia. (2011). The effectiveness of an artistic-based program in social interaction skills and reducing stereotypical behavior in autistic children in Jordan. Unpublished doctoral thesis. Amman Arab University, Amman, Jordan.
- Ali, Delshad. (2012). The effectiveness of a training program to develop social communication skills in a sample of autistic children. Unpublished doctoral thesis. Faculty of Education: Damascus University.
- Al-Subaie, Noura Dasem Menahi (2019). Differences in the Use of Symbolic Communication Methods in Children with Autism Spectrum Disorder Speaking and Non-Native Speakers in Jordan, Unpublished Master's Thesis, University of Jordan, Jordan, Amman.
- Ambitious About Autism. (2020). Behaviours That Challenge. [www.ambitiousaboutautism.org.uk/information-about-autism/behaviour/behaviours-that-challenge](http://www.ambitiousaboutautism.org.uk/information-about-autism/behaviour/behaviours-that-challenge)
- American Academy of Pediatrics. (2020). Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, Arlington, VA, American Psychiatric Association.
- American Speech-Language-Hearing Association (ASHA). (2019). Social Communication Disorder. ASHA: U.S.A.
- Ames, C & Jarrold, C. (2007). The Problem With Using Eye –Gaze to Infer Desire A Deficit of Cue Inference in Children with Spectrum Disorders. *Journal of Autism and Developmental Disorders*. 37, (9), 1761-1775.
- Amin, Suha. (2008). The effectiveness of an early intervention program to develop the common attention of autistic children and its impact on improving their level of social interactions. Unpublished Master's thesis. Faculty of Kindergarten: Alexandria University.
- Aubrey Hui Shyuan Ng, Kim Schulze, Eric Rudrud, Justin B. Leaf; Using The Teaching Interactions Procedure to Teach Social Skills to Children With Autism and Intellectual Disability. *Am J Intellect Dev Disabil* 1 November 2016; 121 (6): 501–519.
- Bali, M., & Lal, R. (2007). Effect of Visual Strategies on Development of Communication Skills in Children with Autism. *Asia Pacific Disability Rehabilitation Journal*. 18, (2), 120-130.

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- Bell, Sheila. (2003). Direct teaching of non-verbal social communication skills how to help our students read the nonverbal information that underlies and precedes verbal language. ASD work shop. OCCSB.
  - Beukelman, D. R., & Light, J. C. (2020). *Augmentative & Alternative*
  - Bondy, Andrew S. & Frost, Lori. (2002). *Topics in Autism: A Picture's Worth PECS and Other Visual Communication Strategies in Autism*. U.S.A.: Woodbine House.
  - Brasic JR, Farhadi F, Elshourbagy T. (2019). Autism Spectrum Disorder. [Internet]. Medscape Drugs & Diseases. Available from: <http://emedicine.medscape.com/article/912781-overview>.
  - Bridgette, L. Tonnsen, D. Boan, C. Bradley, J. Amy C. and Laura A. (2016). Prevalence of Autism Spectrum Disorders Among Children With Intellectual Disability, *American Journal on Intellectual and Developmental Disabilities*, 6, 487-500
  - Buron, K. D. (2020), The 5-Point Scale and Emotional Regulation. Autism Awareness Centre. [autismawarenesscentre.com/5-point-scale-emotional-regulation/](http://autismawarenesscentre.com/5-point-scale-emotional-regulation/)
  - Challenging Behavior: What causes it, and how to manage it. The Good Schools Guide. UK. 2020 Guide. [www.goodschoolsguide.co.uk/special-educational-needs/behavioural/challenging-behaviour](http://www.goodschoolsguide.co.uk/special-educational-needs/behavioural/challenging-behaviour).
  - Charlop-Christy, M.H., Carpenter, M., Le, L., LeBlanc, L.A. and Kellet, K. (2002), Using The Picture Exchange Communication System (Pecs) With Children With Autism: Assessment Of Pecs Acquisition, Speech, Social-Communicative Behavior, And Problem Behavior. *Journal of Applied Behavior Analysis*, 35: 213-231.
  - Chiang, c., Soong, W., Lin, T., & Rogers, S. J. (2008). Non-Verbal communication in young children with Autism. *Journal of Autism and Developmental Disorders*. 38, (10), 1989-1906.
  - *Communication: Supporting Children and Adults with Complex Communication Needs* (5th ed.) Maryland, USA. Paul H. Brookes Publishing Co.
  - Contaldo, A., Colombi, C., Pierotti, C., Masoni, P., Muratori, F. (2020). Outcomes and moderators of Early Start Denver Model intervention in young children with autism spectrum disorder delivered in a mixed individual and group setting. *Autism: The International Journal of Research and Practice*, 24(3), 718–729. <https://doi.org/10.1177/1362361319888344>
  - Curtis, D.B. (2012). Identifying an Optimal and Early Communication Modality for Students with Autism and Intellectual Disability.
  - Desideri, L., Roentgen, U., Hoogerwerf, E., & de Witte, L. (2013). Recommending Assistive Technology (AT) for Children with Multiple Disabilities: A Systematic Review and Qualitative Synthesis of Models and Instruments for AT Professionals: vol. 25, no. 1, pp.3 – 13. doi: 10.3233/TAD-130366.
  - Discourse, Rafat. (2005). The effectiveness of a behavioral training program for attention development in autistic children. Unpublished doctoral thesis. Faculty of Education: Ain Shams University.

- Fusar-Poli L, Brondino N, Rocchetti M, Panisi C, Provenzani U, Damiani S, and Politi P. (2017). Diagnosing ASD in Adults Without ID: Accuracy of the ADOS-2 and the ADI-R. *J Autism Dev Disord.*, 47(11):3370-3379. doi: 10.1007/s10803-017-3258-2. PMID: 28755032.
- Ganz, J.B., Cook, K.E., Corbin-Newsome, J., Bourgeois, B., & Flores, M. (2005). Variations on the Use of a Pictorial Alternative Communication System with a Child with Autism and Developmental Delays. *TEACHING Exceptional Children Plus*, 1(6) Article 3.
- Gazelle, Magdy. (2007). The effectiveness of a training program in the development of social skills in a sample of autistic children in the city of Amman. Unpublished Master's thesis. Faculty of Graduate Studies: University of Jordan.
- Gilson CB, and Carter EW. (2016). Promoting Social Interactions and Job Independence for College Students with Autism or Intellectual Disability: A Pilot Study. *J Autism Dev Disord.* 46(11):3583-3596. doi: 10.1007/s10803-016-2894-2. PMID: 27573857.
- Grohol, J. (2020). Social (Pragmatic) Communication Disorder. *Psych Central*. Retrieved on November 22, 2020, from [psychcentral.com/disorders/social-pragmatic-communication-disorder/](https://psychcentral.com/disorders/social-pragmatic-communication-disorder/)
- Habib, Sally. (2016). The effectiveness of a program-based training program based on the Gray model of social stories in improving certain social skills and modifying challenging behaviors in children with high-performing autism disorder. *Journal of Special Education.* 4. 180-214. 10.
- Hooper, H. Walker, M (2002). Makaton Peer. Tutoring Evaluation: 10 Years On, *British journal of learning disabilities*, vol.30, nol p38-42.
- Hourcade, J., Pilotte, T., West, E. and Parette, P. (2004). A history of augmentative and alternative communication for individuals with severe and profound disabilities. *Focus in Autism and Other Developmental Disabilities.* 19, 235-244.
- Hudry, K., McConachie, H., Le Couteur, A., Howlin, P., Barrett, B., & Slonims, V. (2018). Predictors of reliable symptom change: Secondary analysis of the Preschool Autism Communication Trial. *Autism & Developmental Language Impairments.* <https://doi.org/10.1177/2396941518764760>
- Hughes, C., Kaplan, L., Bernstein, R., Boykin, M., Reilly, C., Brigham, N., Harvey, M. (2012). Increasing Social Interaction Skills of Secondary School Students with Autism and/or Intellectual Disability: A Review of Interventions. *Research and Practice for Persons with Severe Disabilities*, 37(4), 288–307.
- Hui Shyuan Ng A, Schulze K, Rudrud E, and Leaf JB. (2016). Using the Teaching Interactions Procedure to Teach Social Skills to Children With Autism and Intellectual Disability. *Am J Intellect Dev Disabil.* 121(6):501-519. doi: 10.1352/1944-7558-121.6.501. PMID: 27802105.
- Hutchins, T. L. & Prelock, P. A. (2014). Using Communication to Reduce Challenging Behaviors in Individuals with Autism Spectrum Disorder and Intellectual Disability. *Child and adolescent psychiatric clinics of North America*, 23(1), 41-55.

- 
- Ingersoll B, Walton K, Carlsen D, and Hamlin T. (2013). Social intervention for adolescents with autism and significant intellectual disability: initial efficacy of reciprocal imitation training. *Am J Intellect Dev Disabil.* 118(4):247-61. doi: 10.1352/1944-7558-188.4.247. PMID: 23937368.
  - Johnston, S., Evans, E. and Joanne, P. (2004). *The use of visual support in teaching young children with Autism Spectrum Disorder to Initiate Interactions* London: Pawel Company.
  - Khatib, Jamal. (2021). *Basics of Special Education*. Amman: Dar Al Fikr.
  - Khiran, right. (2011). *The effectiveness of a training program for the development of verbal communication and its impact on social interaction in a sample of autistic children*. Unpublished Master's thesis. Faculty of Education: Damascus University.
  - Laister, D., Stammer, M., Vivanti, G., & Holzinger, D. (2021). Social-communicative gestures at baseline predict verbal and nonverbal gains for children with autism receiving the Early Start Denver Model Autism, 25(6), 1640–1652. <https://doi.org/10.1177/1362361321999905>
  - Lal, R. (2010). Effect of alternative and augmentative communication on language and social behavior of children with autism. *Educational Research and Reviews*, 5(3), 119-125.
  - Liu KP, Wong D, Chung AC, Kwok N, Lam MK, Yuen CM, Arblaster K, and Kwan AC. (2013). Effectiveness of a workplace training programme in improving social, communication and emotional skills for adults with autism and intellectual disability in Hong Kong--a pilot study. *Occup Ther Int.* 20(4):198-204. doi: 10.1002/oti.1356. Epub 2013 Jul 16. PMID: 23861094.
  - Lord, C., Risi, S., Lambrecht, L., Cook, E. H., Leventhal, B. L., DiLavore, P. C., Rutter, M. (2000) The autism diagnostic observation schedule-generic: A standard measure of social and communication deficits associated with the spectrum of autism. *Journal of Autism and Developmental Disorders* 30: 205–223. doi:10.1023/A:1005592401947.
  - Nunes, D & Hanline, M.F. (2007) Enhancing the Alternative and Augmentative Communication Use of a Child with Autism through a Parent- implemented Naturalistic Intervention, *International Journal of Disability, Development and Education*, 54:2, 177-197.
  - O’Keeffe, C., McNally, S. A Systematic Review of Play-Based Interventions Targeting the Social Communication Skills of Children with Autism Spectrum Disorder in Educational Contexts. *Rev J Autism Dev Disord* (2021). <https://doi.org/10.1007/s40489-021-00286-3>
  - Owaijan, Bushra. (2012). *The effectiveness of a training program in developing non-verbal communication skills in autistic children*. Unpublished Master's thesis. Faculty of Education: Damascus University.
  - Plavnick JB, Kaid T, and MacFarland MC. (2015). Effects of a School-Based Social Skills Training Program for Adolescents with Autism Spectrum Disorder and Intellectual Disability. *J Autism Dev Disord.* 45(9):2674-90. doi: 10.1007/s10803-015-2434-5. PMID: 25820638.
  - Reitman, R. (2005). *Effectiveness of music therapy intervention on joint attention in children diagnosed with Autism, a pilot study*, American Psychiatric Publishing.

- Riahi, Rafeef, Zubairi, Batoul, (2017). Social interaction skills in autistic children. *Arabian Gulf Magazine*. 45. .P. 345- 380.
- Richdale, A., Raising Children. (2020). Emotional development in children with autism spectrum disorder: Emotions and children with autism spectrum disorder. [raisingchildren.net.au/autism/development/social-emotional-development/emotional-development-asd](http://raisingchildren.net.au/autism/development/social-emotional-development/emotional-development-asd)
- Safira, Irga & Rangkuti, Rahmadsyah & Nasution, Ely & Harefa, Yulianus. (2020). Non-Verbal Communication by Autistic Children. *ELS Journal on Interdisciplinary Studies in Humanities*. 3. 492-505. 10.34050/elsjish.v3i4.8065.
- Sheikh Theeb, Raed. (2004). Design a training program to develop communicative and social skills and autonomy in autistic children and measure its effectiveness. Unpublished doctoral thesis. Faculty of Graduate Studies: University of Jordan.
- Sheinkopf, S. J. (2005). Hot Topic in Autism: Cognitive Deficits, Cognitive Style, and Joint Attention Dysfunction. *Medicine and Health/Rhode Island*. 88, (5), 155-158.
- Sigafos, J., O'Reilly, M.F., Lancioni, G.E. et al. (2014). Augmentative and Alternative Communication for Individuals with Autism Spectrum Disorder and Intellectual Disability. *Curr Dev Disord Rep* 1, 51–57 (2014).
- Siu AMH, Lin Z, and Chung J. (2019). An evaluation of the TEACCH approach for teaching functional skills to adults with autism spectrum disorders and intellectual disabilities. *Res Dev Disabil*. 90:14-21. doi: 10.1016/j.ridd.2019.04.006. Epub 2019 Apr 24. PMID: 31028977.
- Smith, D. (2003). *Introduction to Special Education: Teaching in an Age of Opportunity*. (5th Ed). Allyn & Bacon.
- Soorya, L., Arnstein, L., Gillis, J., & Romanczyk, R. (2003). An over review of imitation skills in Autism: implications for practice. *The behavior Analyst today*. 14, (2), 114-123.
- Stauch TA, Plavnick JB, Sankar S, and Gallagher AC. (2018). Teaching social perception skills to adolescents with autism and intellectual disabilities using video-based group instruction. *J Appl Behav Anal*. 51(3):647-666. doi: 10.1002/jaba.473. Epub 2018 May 17. PMID: 29774525.
- Walsh E, Holloway J, and Lydon H. (2018). An Evaluation of a Social Skills Intervention for Adults with Autism Spectrum Disorder and Intellectual Disabilities preparing for Employment in Ireland: A Pilot Study. *J Autism Dev Disord*. 48(5):1727-1741. doi: 10.1007/s10803-017-3441-5. PMID: 29224188.
- Walton KM, and Ingersoll BR. (2013). Improving social skills in adolescents and adults with autism and severe to profound intellectual disability: a review of the literature. *J Autism Dev Disord*. 43(3):594-615. doi: 10.1007/s10803-012-1601-1. PMID: 22790427.
- Watkins, L., O'Reilly, M., Kuhn, M. et al. A Review of Peer-Mediated Social Interaction Interventions for Students with Autism in Inclusive Settings. *J Autism Dev Disord* 45, 1070–1083 (2015).

- 
- Weiss, J., Thomson, K., Riosa, P., Albaum, C., Chan, V., Maughan, A., Tablon, P. & Black, K. (2018). A randomized waitlist-controlled trial of cognitive behavior therapy to improve emotion regulation in children with autism. *Journal of Child Psychology and Psychiatry*. doi:10.1111/jcpp.12915.
  - Wilkinson, K. M., & McIlvane, W. J. (2013). Perceptual factors influence visual search for meaningful symbols in individuals with intellectual disabilities and Down syndrome or autism spectrum disorders. *American Journal on Intellectual and Developmental Disabilities*, 118(5), 353–364.
  - Zureikat, Ibrahim (2020). *Effective Interventions with Autism Spectrum Disorder: Therapeutic Practices Based on Scientific Research*, (1), Amman: Dar Al Fikr.