

The Effectiveness of the LOVAAS Program in Developing Oral Language in Children with Autism Spectrum Disorder

فعالية برنامج لوفاس في تطوير اللغة الشفهية عند الأطفال ذوي اضطراب طيف التوحد

Karboua Sihem¹, Bouhraoua Meriem²

¹ University of Tipaza, Algeria, karboua.sihem@univ-tipaza.dz.

² University of Tipaza, Algeria, meriembouhraoua1@gmail.com.

Received: 29/12/2025

Accepted: 18/04/2026

Published:01/06/2026

Abstract:

The study aims to determine the effectiveness of the LOVAAS program in developing oral language in children with autism spectrum disorder. To achieve this, we adopted a quasi-experimental approach with a single-group design, utilizing pre- and post-measurements of the Oral Language Test (ELO), which is divided into receptive language items and expressive language items. The pre- and post-measurements of the study tool were interspersed with our application of LOVAAS program activities to the study group, which consisted of 7 purposively selected cases. These were children with moderate autism spectrum disorder who suffer from weaknesses in verbal communication skills, aged between 7 and 10 years, of both genders (male and female), who had received early intervention and were enrolled at the Psychopedagogical Center for Mentally Disabled Children in Bou Ismail.

The results confirmed the general hypothesis of the study, namely that the LOVAAS program is effective in developing oral language in children with autism spectrum disorder, in both its receptive and expressive aspects.

Keywords: Autism spectrum, oral language, LOVAAS program.

ملخص:

تهدف هذه الدراسة إلى تحديد مدى فاعلية برنامج لوفاس (LOVAAS) في تطوير اللغة الشفهية لدى الأطفال ذوي اضطراب طيف التوحد. ولتحقيق ذلك، تم اعتماد المنهج شبه التجريبي بتصميم المجموعة الواحدة، من خلال تطبيق القياسين القبلي والبعدي لاختبار اللغة الشفهية (ELO)، الذي يتضمن بنوداً خاصة باللغة الاستقبالية وأخرى خاصة باللغة التعبيرية. وقد تخللت القياسين القبلي والبعدي عملية تطبيق أنشطة برنامج لوفاس على أفراد عينة الدراسة، والتي تكونت من سبع (7) حالات تم اختيارها قصدياً. وتمثلت العينة في أطفال يعانون من اضطراب طيف التوحد بدرجة متوسطة، ويظهر لديهم ضعف في مهارات التواصل اللفظي، وتتراوح أعمارهم بين 7 و10 سنوات، من كلا الجنسين (ذكور وإناث)، وقد استفادوا من تدخل مبكر، وهم ملتحقون بالمركز النفس-تربوي للأطفال المعاقين ذهنياً ببواسماعيل.

وقد أكدت النتائج صحة الفرضية العامة للدراسة، والمتمثلة في فاعلية برنامج لوفاس في تنمية اللغة الشفهية لدى الأطفال ذوي اضطراب طيف التوحد، سواء في جانبها الاستقبالي أو التعبيري. الكلمات المفتاحية: اضطراب طيف التوحد، اللغة الشفهية، برنامج لوفاس.

The Effectiveness of the LOVAAS Program in Developing Oral Language in Children with Autism Spectrum Disorder

1. Introduction:

Autism spectrum disorder represents one of the neurodevelopmental disorders that has received increasing attention recently, due to the rising rates of its prevalence among children and the complexity of its symptoms and their overlap with many other disorders and disabilities. It is a neurodevelopmental disorder whose symptoms usually appear during the first three years of a child's life. Smith defined it as a condition affecting children who suffer from severe withdrawal from society, loss of ability to communicate, or failure to develop social relationships with others (Smith, 1975).

Zureikat also defines it as a severe disorder in the communication process that appears in early childhood stages, where those affected are characterized by clear difficulties in social communication, with repetitive behavioral patterns, accompanied by severe variation in the level of verbal and non-verbal language, ranging from slight delay in acquiring words to an almost complete absence of language (Zureikat,2017).

Language and communication disorders are among the central and fundamental problems suffered by children with autism spectrum disorder, which negatively affect aspects of their natural development and social interaction with others. These disorders are particularly manifested in oral language in both its expressive and receptive aspects, where a noticeable delay is observed in their acquisition of vocabulary and construction of grammatically correct sentences, repeated resort to using linguistic expressions without complete functional understanding of them, with pragmatic difficulties in using language to express needs and feelings.

In this regard, we find the study of (Ben Slimane, 2024), which aimed to reveal the relationship between oral comprehension and linguistic production in autism spectrum disorder using the descriptive approach based on case study, for five children with mild autism spectrum disorder. The results obtained using the Childhood Autism Rating Scale CARS2 and applying the adapted Oral Language Assessment Test (ELO) confirmed the existence of a statistically significant relationship between oral comprehension and linguistic production and autism spectrum disorder, as it affects the child's acquisition and understanding of language and also affects their communication process with the external world, which shows that autism spectrum disorder, regardless of its degree, affects the child's language acquisition process, understanding it, and producing it.

Given these linguistic and communicative challenges, early intervention through training and rehabilitation programs is necessary to develop these children's abilities to communicate with others. Many specialized training programs have been developed for this category, such as the TEACCH program, the Denver program, the ABLLS program, the VB-MAPP program, and the LOVAAS program.

The Applied Behavior Analysis (LOVAAS) program is one of the programs used in the field of therapeutic intervention for children with autism spectrum. This program was named after its developer, psychiatrist Ivar Lovaas, and is based on the foundations of behavioral theory and conditioned response in psychology. The LOVAAS program is based

on three basic principles: the use of behavioral techniques, continuous performance measurement, and following a sequential approach in training. The program aims to modify the behavior of children with autism and shape new behaviors using a mix of various techniques such as positive reinforcement, shaping and chaining, and task analysis into small sequential skills, making them easy to learn and achieve maximum functional independence and improve quality of life (Hefny,2003).

The most important international studies include those conducted by Lovaas himself in 1987, where he implemented the intensive program on a sample of 19 children with autism spectrum disorder aged between 3 to 11 years, with 40 hours of treatment per week over two years. The results showed after the end of the intervention period that 47% of the children developed oral language skills significantly, including increased vocabulary, improved grammatical structures, and initiative in conversation (Lovaas,1987).

Eldevik and colleagues' study (2009) conducted a meta-analysis of research that addressed the application of early intervention (including the Lovaas model) on 155 children with autism spectrum disorder. Treatment sessions were distributed between 20 and 40 hours per week, using standardized assessment criteria for expressive language and independence. The analysis concluded that the average increase in expressive oral skills among children who received ≥ 30 hours of treatment per week was higher by about 1.2 standard deviations compared to those who received less than 20 hours, with clear improvement in their vocabulary and sentence construction (Eldevik, Hastings, Hughes , & et al,2009).

In Arab studies, we find Mustafa's study (2016) in Saudi Arabia, which addressed the effectiveness of the LOVAAS program in developing language skills for children with autism spectrum disorder in the early intervention stage. The study was applied to a sample of 20 children, and the results showed statistically significant differences between the performance averages of the experimental sample members in favor of the post-measurement, indicating the contribution of the LOVAAS program in developing linguistic communication among children with autism spectrum (Mustafa,2016).

At the local level, studies that addressed the application of the LOVAAS program for children with autism spectrum are relatively few. Among these studies is one conducted by Belkacem in 2021, which was conducted on five children in Algiers aged between 4 and 7 years diagnosed with mild to moderate autism spectrum disorder. The LOVAAS program was applied intensively, with sessions lasting 35 hours per week for a full year, relying on visual and auditory linguistic reinforcement methods (pictorial cards and audio recordings). The post-analysis of the study showed that the average number of expressive vocabulary in children increased from 20 words to 55 words, recording an increase of 175%. Their ability to understand instructions also improved from 40% to 80%. Additionally, new pragmatic skills appeared such as asking for help and expressing feelings, confirming the effectiveness of the program in developing oral language and interactive communication in the Algerian environment (Belkacem,2021).

The Effectiveness of the LOVAAS Program in Developing Oral Language in Children with Autism Spectrum Disorder

Based on the above, and stemming from our field observations as specialists working with children with autism spectrum, our research inclinations, as well as our special training in the LOVAAS program and its application, and based on previous studies that proved the effectiveness of this program in different cultural contexts, and our desire to evaluate its effectiveness in the local environment due to the limited previous studies that addressed this topic in the Algerian environment, we can formulate the problem of the current study in the form of questions as follows:

Main Question:

- Is the LOVAAS program effective in developing oral language in children with autism spectrum?

Sub-questions:

- Are there statistically significant differences between the results of pre- and post-measurements in favor of the post-measurement in the ELO test (receptive language item) in children with autism spectrum after applying the LOVAAS program?
- Are there statistically significant differences between the results of pre- and post-measurements in favor of the post-measurement in the ELO test (expressive language item) in children with autism spectrum after applying the LOVAAS program?

Study Hypotheses

General Hypothesis:

- The LOVAAS program is effective in developing oral language in children with autism spectrum.

Partial Hypotheses:

- There are statistically significant differences between the results of pre- and post-measurements in favor of the post-measurement in the ELO test (receptive language item) in children with autism spectrum after applying the LOVAAS program.
- There are statistically significant differences between the results of pre- and post-measurements in favor of the post-measurement in the ELO test (expressive language item) in children with autism spectrum after applying the LOVAAS program.

2. Study Methodology:

We adopted a quasi-experimental design with a single group that includes pre- and post-measurements of the dimensions of the Oral Language Test (ELO), that is, before and after applying the activities of the LOVAAS training program to the study group. This methodology is used when strict experimentation cannot be applied in the field and allows the researcher to partially intervene to determine the effect of an independent variable on a dependent variable under realistic conditions (Obeidat, Al-Adwan, & Abdel Salam, 2004).

3. Study Limitations:

3.1 Spatial Limitations:

Our study was conducted at the Pedagogical Psychological Center for Mentally Disabled Children located in the municipality of Bou Ismail.

3.2 Temporal Limitations:

The time period for the main study extended from 20/10/2024 to 17/04/2025.

4. Study Group:

The study group was selected purposively, consisting of 7 children with autism spectrum disorder (moderate degree) who suffer from oral language disorders affecting both receptive language and expressive language (according to their medical and speech therapy files at the center). Their ages range from 7 to 10 years of both genders (males/females), who have undergone early intervention and are enrolled at the Pedagogical Psychological Center for Mentally Disabled Children in Bou Ismail. The following table summarizes the characteristics of the study group.

Table 1: Characteristics of the Study Group

Cases	Age	Degree of Disorder	Age at Diagnosis	Age at Intervention
Case 1	10 years, 2 months	Moderate	3 years	3 years
Case 2	8 years, 8 months	Moderate	3 years	3 years
Case 3	9 years, 11 months	Moderate	4 years	4 years
Case 4	7 years, 4 months	Moderate	4 years	4 years
Case 5	8 years, 1 month	Moderate	3 years	3 years
Case 6	10 years, 11 months	Moderate	4 years	5 years
Case 7	10 years, 3 months	Moderate	3 years	3 years

5. Study Tools:

5.1 ELO Test:

The Khomsi Oral Language Test (ELO), adapted to the Algerian environment, was applied. This test aims to identify the study group and assess receptive language through the lexical reception and comprehension items, as well as to evaluate expressive language through lexical production, phrase production, and repetition of words and phrases. The test is appropriate for the age group of the children in our study sample (7 to 10 years old).

5.2 LOVAAS Program:

A. Definition of the LOVAAS Program:

The LOVAAS Program is an early and intensive behavioral intervention specifically designed for children with autism spectrum disorder. It is based on the principles of Applied Behavior Analysis (ABA) and was developed by Dr. Ivar Lovaas at the University of California, Los Angeles (UCLA) in the 1970s.

- **Main Objective:** To improve behavioral, linguistic, cognitive, and social skills in children with autism through early and intensive intervention.
- **Target Group:** Children aged two to thirteen years, especially those who show symptoms of autism at an early age.
- **Founder:** Developed by the psychologist Ivar Lovaas, one of the pioneers in systematically applying ABA with autistic children.

B. Characteristics of the LOVAAS Program:

- **Intensive Intervention:**
 - Up to 40 hours per week of individual sessions.
 - Typically extends over 2 to 3 years.

The Effectiveness of the LOVAAS Program in Developing Oral Language in Children with Autism Spectrum Disorder

- Conducted in a structured environment, often at home or in specialized centers.
- **Based on Applied Behavior Analysis (ABA):**
 - Utilizes positive reinforcement principles to shape behavior.
 - Each skill is analyzed and taught gradually using Discrete Trial Training (DTT) techniques.
- **Individualized Approach:**
 - An individualized educational plan is designed for each child according to their abilities and needs.
 - The program is periodically adjusted based on the child's progress.
- **Focus on Core Skills:**
 - Such as communication, imitation, play, self-care, and social interaction.

C. LOVAAS Foundations in ABA:

- Discrete Trial Training (DTT) techniques.
- Teaching skills through repeated and organized sessions.
- Each session includes skill instruction, reinforcement, and repetition.
- Data collection and progress analysis: Every child's response is recorded and analyzed to make precise educational decisions.
- Positive behavior reinforcement: Rewards are used to encourage desired behaviors.
- Gradual integration: At advanced stages, the program seeks to integrate the child into mainstream educational environments.

D. Benefits of Using the LOVAAS Program:

- Many children show significant improvement in language, behavior, and cognitive skills.
- The program is based on solid scientific foundations and ongoing assessment.
- It is among the most widely researched programs regarding its impact on autism.
- Parents are actively involved in implementing the sessions.

If you are looking for an effective behavioral program for children with autism, the LOVAAS program is considered one of the most successful models, especially when applied intensively and at an early age (Kahal,2016).

E. Procedures for Applying the Program to the Study Group:

- **Pre-Assessment Stage:**

Before starting the LOVAAS program, we first assessed the oral language level of the study group by applying the ELO test.

- **Program Training Stage:**

The study group was trained on the LOVAAS program, focusing only on receptive and expressive language skills, without addressing other skills. Based on this, the number of sessions ranged from 15 to 20 hours per week, distributed over 4 daily sessions, each lasting 30 to 45 minutes, for a period determined by the intervention plan for each child.

- **Post-Assessment Stage:**

After completing the program training, we reapplied the ELO test.

F. Techniques Used with Cases in the Program:

- **Verbal and Visual Prompting:** Direct verbal instructions are given, accompanied by visual cues or gestures to support the child's understanding.
- **Positive Reinforcement:** The child is rewarded for correctly identifying the required body part.
- **Repetition and Gradual Progression:** The activity is presented in a graded manner from easiest to most difficult, starting with the most obvious parts (head, eye, etc.) to the less obvious ones (elbow, fingertips, etc.).
- **Physical Support:** When needed, the child's hand is guided to the correct location to support the response.
- **Generalization:** The LOVAAS program is used both in the classroom with the educator and at home with parents.

G. Example of Program Sessions:

- **Session Title:** Recognizing Body Parts
- **Session Duration:** 30 minutes
- **General Objective:** The child identifies the names of body parts and responds appropriately upon hearing the name of each part.

H. Procedures for Conducting the Session with Study Cases:

- The examiner and the child sit face-to-face.
- The examiner presents pictures or uses a doll/mirror to help the child identify the required part.
- The examiner gives instructions such as: "Where is your nose?", "Show me your hand," and so on.
- If the child responds correctly, immediate reinforcement is given.
- In case of no response, redirection is provided in a simplified manner with physical or visual support.
- Responses are recorded in a special table to track progress.

6. Statistical Methods:

To achieve the objectives of the study and analyze the collected data, the Statistical Package for the Social Sciences (SPSS 26) was used. This program includes a wide range of statistical tests that fall under descriptive statistics, such as frequencies, means, standard deviations, among others, as well as inferential statistics, such as correlation coefficients, univariate and multivariate analysis of variance, and others. Given the nature of the topic and in pursuit of the study's objectives, the most appropriate statistical measures required for this study are as follows:

- **Arithmetic Mean ("Moyenne"):**

Used to determine the average responses of the participants regarding the test.

- **Standard Deviation ("Ecart type"):**

Used to determine the value and level of individual differences in the participants' responses to the test.

- **Wilcoxon Signed-Rank Test for Two Related Samples ("Test de Wilcoxon"):**

The Effectiveness of the LOVAAS Program in Developing Oral Language in Children with Autism Spectrum Disorder

Used to compare two related samples with quantitative data that are not normally distributed. Its purpose is to determine the degree and direction of differences in the participants' responses to the test.

Effect Size Test "r" for Two Related Nonparametric Samples:

Used to determine the degree of effect of the independent variable on the dependent variable when the researcher controls the independent variable, and the sample consists of two related groups with a small size (less than 30) or nonparametric data.

7. Presentation, Analysis, and Discussion of Results According to the General Hypothesis:

The general hypothesis of the study states: "The LOVAAS program is effective in developing oral language in children with autism spectrum disorder." To verify its validity, we present, analyze, and discuss the results of its partial hypotheses, starting from the sub-hypotheses that constitute it:

7.1. Presentation, Analysis, and Discussion of Results According to the First Sub-Hypothesis:

The first sub-hypothesis states that: There are statistically significant differences between the results of the pre- and post-measurements in favor of the post-measurement in the ELO test (receptive language item) among children with autism spectrum disorder after applying the LOVAAS program. Below is the presentation and analysis of its statistical results:

Table 2: Differences Between Pre- and Post-Measurement Results in the Receptive Language Item (Oral Comprehension) Among Children with Autism Spectrum Disorder After Applying the LOVAAS Program							
Test	Arithmetic Mean	Standard Deviation	Wilcoxon Test (Z value)			Significance Level	
			Test Z	Significance Level	Decision	Test	Arithmetic Mean
Pre-test	61,57	12,52	-2,36	0,01	Significant differences in favor of post	0,89	Strong positive effect
Post-test	82,57	14,85					
Interpretation of "r": [≤ 0.30) = Weak / 0.30 ≤ 0.50 = Moderate / ≥ 0.50 = Strong.							

The results of Table 2, which include the Wilcoxon test, Kendall's correlation coefficient, and the effect size test, illustrate the differences between the pre- and post-measurement results for the Oral Language Scale in the receptive language item (oral comprehension) for the study group, before and after training with the LOVAAS program as related to the first sub-hypothesis. The value of the arithmetic mean for the receptive language (oral comprehension) test among children with autism spectrum disorder after applying the LOVAAS program was (82.57) with a standard deviation of (14.85), which is higher than its

pre-program mean of (61.57) with a standard deviation of (12.52). This indicates that the results of children with autism spectrum disorder in the receptive language (oral comprehension) test improved significantly after the application of the LOVAAS program. This is further confirmed by the Wilcoxon value, converted to the standardized "Z" value, which was (-2.36) and is significant at a significance level of (0.01).

This means that there are differences between the pre- and post-measurement results in favor of the post-measurement in the receptive language (oral comprehension) dimension among children with autism spectrum disorder after applying the LOVAAS program.

In the same direction, the calculated effect size "r" value was (0.89), which falls within the " ≥ 0.50 " range, indicating that the application of the LOVAAS program had a strong and positive effect on improving oral comprehension as a form of receptive language. Accordingly, the LOVAAS program is effective in developing receptive language (oral comprehension) in children with autism spectrum disorder.

Based on the above, it can be stated that there are statistically significant differences between the pre- and post-measurement results in favor of the post-measurement in the ELO test for the receptive language item among children with autism spectrum disorder after applying the LOVAAS program. Therefore, the first sub-hypothesis of the study has been confirmed.

We interpret the growth and development of receptive language skills (oral comprehension) in the study group as a result of the LOVAAS program's goal to enhance linguistic comprehension through intensive and interactive language training, which emphasizes teaching the child to respond to commands and questions and to recognize meanings and concepts. This type of language intervention is effective in strengthening auditory attention and engagement in structured learning situations, which contributes to consolidating vocabulary and language understanding in the child.

The current study's results have demonstrated the effectiveness of this program in raising the level of receptive language performance, which aligns with findings from the literature in psycholinguistics that emphasize the importance of intensive and targeted training in improving language skills in children with autism spectrum disorder. This effectiveness is attributed to the LOVAAS program's reliance on principles of motivation, positive reinforcement, and repetition, enabling the child to acquire language skills in a correct and stable manner.

7.2. Presentation, Analysis, and Discussion of Results According to the Second Sub-Hypothesis:

The second sub-hypothesis states: "There are statistically significant differences between the results of the pre- and post-measurements in favor of the post-measurement in the ELO test (expressive language item) among children with autism spectrum disorder after applying the LOVAAS program." Below is the presentation and analysis of its statistical results:

The Effectiveness of the LOVAAS Program in Developing Oral Language in Children with Autism Spectrum Disorder

Table 3: Differences Between Pre- and Post-Measurement Results in the Expressive Language Item (Oral Production) Among Children with Autism Spectrum Disorder After Applying the LOVAAS Program

Test	Arithmetic Mean	Standard Deviation	Wilcoxon Test (Z value)			Significance Level	
			Test Z	Significance Level	Decision	Test	Arithmetic Mean
Pre-test	24,14	5,63	-2,37	0,01	Significant differences in favor of post	0,89	Strong positive effect
Post-test	33,57	6,18					
Interpretation of "r": [≤ 0.30) = Weak / $0.30 \leq 0.50$ = Moderate / ≥ 0.50 = Strong.							

Based on the results presented in Table 3, which include the Wilcoxon test, Kendall's correlation coefficient, and the effect size "r" test, the differences between the pre- and post-measurement results for the Oral Language Scale in the expressive language item (oral production) for the study group—before and after training with the LOVAAS program as related to the second sub-hypothesis—are evident. The arithmetic mean for the expressive language (oral production) test among children with autism spectrum disorder after applying the LOVAAS program was 33.57, with a standard deviation of 6.18, which is higher than the pre-program mean of 24.14, with a standard deviation of 5.63. This indicates that the results of children with autism spectrum disorder in the expressive language (oral production) test improved significantly after the application of the LOVAAS program.

This improvement is further confirmed by the Wilcoxon value, converted to the standardized "Z" value, which was (-2.37) and is significant at a significance level of 0.01. This means that there are statistically significant differences between the pre- and post-measurement results in favor of the post-measurement in the expressive language (oral production) dimension among children with autism spectrum disorder after applying the LOVAAS program.

Similarly, the calculated effect size "r" value was 0.89, which falls within the " ≥ 0.50 " range. This indicates that the application of the LOVAAS program had a strong and positive effect on improving expressive language (oral production) in the study group. Accordingly, the LOVAAS program is effective in developing expressive language (oral production) in children with autism spectrum disorder.

Therefore, it can be concluded that there are statistically significant differences between the pre- and post-measurement results in favor of the post-measurement in the ELO test for

the expressive language item among children with autism spectrum disorder after applying the LOVAAS program. This confirms the validity of the second sub-hypothesis of the study.

The results of the current study have demonstrated the effectiveness of the LOVAAS program in raising the level of expressive language, which is consistent with findings from the literature in psycholinguistics that emphasize the importance of intensive and targeted training in improving language skills among children with autism spectrum disorder. This effectiveness is attributed to the inclusion of principles such as motivation, positive reinforcement, and repetition within the LOVAAS program, enabling children to acquire language skills in a correct and stable manner.

At the conclusion of our presentation, analysis, and discussion of the study results according to the sub-hypotheses that constitute the general hypothesis, we can state that the general hypothesis of the study has been confirmed by the validation of its two sub-hypotheses related to receptive and expressive language. That is, the LOVAAS program is effective in developing oral language in children with autism spectrum disorder.

These findings are consistent with the study by Lovaas (1987), whose results demonstrated the effectiveness of the LOVAAS program in significantly developing oral language in children with autism spectrum disorder, including increases in vocabulary, improvements in grammatical structures, and greater initiative in conversation. The current study's results also align with the findings of Eldevik et al. (2009), which confirmed that the LOVAAS model is effective for individuals with autism spectrum disorder in improving their vocabulary and sentence construction.

Similarly, these results are supported by several Arab and local studies, such as the study by Mustafa (2016), which indicated that the LOVAAS program contributed to the development of linguistic communication in children with autism spectrum disorder. The study by Belkacem (2021) also concluded that the abilities of children with autism spectrum disorder (the study group) to understand instructions improved, and new pragmatic skills emerged—such as requesting help and expressing emotions—further confirming the effectiveness of the program in developing oral language and interactive communication.

9. Conclusion:

Autism spectrum disorder is a developmental disorder that affects many cognitive and behavioral functions, particularly in the domains of linguistic communication and social interaction. Oral language, both in its receptive and expressive aspects, is among the most prominent difficulties faced by children with autism spectrum disorder, whether in acquiring it or applying it within daily life contexts. The importance of the current study lies in investigating the effectiveness of the LOVAAS program—as one of the most prominent early intensive behavioral intervention programs—in developing receptive and expressive language in children with autism spectrum disorder. The results of the study demonstrated that the application of this program led to a statistically significant improvement in their linguistic performance, with noticeable development observed in their abilities to comprehend language (receptive language) as well as in their abilities for verbal expression (expressive language).

The study's hypotheses were confirmed, as statistically significant differences were

The Effectiveness of the LOVAAS Program in Developing Oral Language in Children with Autism Spectrum Disorder

recorded between the pre- and post-measurement results in favor of the post-program results, which confirms the effectiveness of the program in improving the targeted aspects. These results are attributed to the behavioral foundations upon which the program is based, which rely on repetition, positive reinforcement, and Applied Behavior Analysis (ABA)—methods that have proven successful in working with children with autism spectrum disorder.

Accordingly, the LOVAAS program is considered an effective therapeutic approach that can be relied upon to improve verbal communication in children with autism spectrum disorder, especially if implemented in a supportive environment and under the supervision of trained specialists. This opens promising prospects in the field of early intervention and improving the quality of life for children and their families.

• Recommendations:

- Adopt the LOVAAS program as an effective therapeutic tool for developing verbal communication skills in children with autism spectrum disorder, given its proven effectiveness as demonstrated by the statistical results of the study.
- Train speech-language specialists and child educators on the principles of Applied Behavior Analysis (ABA) and positive reinforcement techniques to effectively implement the program within specialized centers and inclusive schools.
- Emphasize the importance of early intervention and intensifying therapeutic sessions at an early age to achieve better outcomes in language development and social interaction.
- Involve the family in the implementation of the LOVAAS program by raising their awareness and training them to use behavioral techniques at home, as this plays a supportive role in generalizing the child's language gains.
- Conduct broader future studies on larger samples in diverse environments to verify the consistency and effectiveness of the program in the Algerian context, and to compare its results with other intervention programs.
- Improve university training programs in the field of speech-language pathology by including practical modules on modern therapeutic programs, adapting and standardizing them, as well as tests specific to this population.
- Encourage multidisciplinary collaboration among speech-language pathologists, psychologists, and educators to achieve integration in therapeutic work for the benefit of children with autism spectrum disorder.

10. Bibliography List :

1. Smith, M. (1975). *childhood autism : A developmental disorder*. Academic press.
2. Zureikat, M. A. (2017). *Autism and Characteristics of Treatment*. Dar Al-Fikr Al-Arabi.
3. Ben Slimane, N. E. (2024). The Relationship Between Language Production and Oral Comprehension in Autism Spectrum Disorder Accompanied by Epilepsy Using the Khomsi Test (ELO). *Journal of Law and Human Sciences*, 17(01), 319-331.
4. Hefny, M. H. (2003). *Behavior Analysis and Modification of Human Behavior*. Dar Al-Fikr Al-Arabi.
5. Lovaas, O. (1987). Behavioral Treatment And Intellectual Functioning in Yong Antistic children. *Journal Of consulting and clinical Pschology*, 55(01), 3-9.
6. Eldevik S, Hastings RP, Hughes JC, & et al. (2009). Meta-analysis of Early Intensive Behavioral Intervetion for Children with Autism. *Journal of Clinical Child and Adolescent Psychology*, 38(03), 439-450.
7. Mustafa, A. (2016). *The Effectiveness of a Training Program Based on Applied Behavior Analysis (ABA) in Developing the Skills of Children with Autism in the Early Intervention Stage*. Master's Thesis.
8. Belkacem, M. (2021). *The effectiveness of the LOVAAS program in developing oral language in children with autism spectrum disorder*. A field study. Unpublished master's thesis. University of Algiers 2.
9. Obeidat, Z., Al-Adwan, A. R., & Abdel Salam, M. (2004). *Scientific Research: Its Concept, Tools, and Methods*. Dar Al-Fikr for Publishing and distribution.
10. Kahal, Z. (2016). *Care for Children with Autism: A Psychological Perspective*. Khalif Publishing and Printing House.