

Effectiveness of the Applied Behavior Analysis Program in Developing Naming Skill in Children with Autism Spectrum Disorder

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Abstract:

This study aims to demonstrate the efficacy of Applied Behavior Analysis (ABA) techniques in enhancing naming abilities and their associated components in a cohort of children with mild autism spectrum disorder (ASD). The research was performed on 2 four-year-old children employing a quasi-experimental case study methodology. The procedures employed included interviews, structured observation, and standardized test instruments such as the Childhood Autism Diagnostic Scale (CARS) and the ABLLS-R Language and Learning Test. A four-month ABA-focused training program aimed at enhancing naming skills was conducted, using pre-, follow-up, and post-tests to evaluate improvement. The results indicated a substantial enhancement in naming abilities and all associated components, demonstrating a steady advancement from basic to more intricate responses. This validates the efficacy of ABA techniques in improving linguistic abilities in children with ASD.

Keywords: Autism, Spectrum Disorder; Applied Behavior Analysis Program; Naming Skill.

1. INTRODUCTION

Autism Spectrum Disorder (ASD) is a neurodevelopmental condition that draws the attention of researchers, practitioners, and parents due to the complexity of its symptoms and its diverse cognitive, behavioral, social, and psychological manifestations. In 1943, Austrian physician Kanner described autism as a syndrome characterized by a set of traits observed in children of typical intelligence, including social isolation, linguistic echolalia, and a propensity for routine and behavioral.

The complexity and obscurity of this disorder complicate early diagnosis and intervention, resulting in pronounced challenges in verbal and non-verbal communication, impaired social interaction, repetitive behavioral patterns, and restricted, non-specific interests.

Quin et al. (2024) note that ASD is among the most intricate neurodevelopmental disorders, as current scientific evidence points to a multifaceted interplay between genetic factors, such as mutations or chromosomal alterations, and environmental influences, including complications during pregnancy and childbirth or exposure to specific toxins (Wang, 2024, p. 10). Research, including Al-Sharqawi (2018), indicates that autism symptoms encompass cognitive deficits independent of intelligence quotient, intermittent intellectual delays, disruptions in feeding and sleeping patterns, and atypical emotional reactions. Their manifestations also include self-injurious or harmful behaviors toward others, social withdrawal, repetitive and stereotypical behaviors, language impairments such as echolalia or improper pronoun usage, and limited symbolic play, highlighting various challenges in social interaction and language development (El-Sharkawy, 2018, pp. 81–83).

In addition to social, behavioral, and cognitive impairments, children with autism experience linguistic and communication difficulties. These challenges are among the most salient characteristics differentiating ASD and

impede the child's ability to express needs and interact effectively, thereby affecting psychological and social development. Maghawry Najwa (2023) asserts that ASD impacts children's linguistic abilities, including both verbal and semantic comprehension as well as language production. Significant difficulties manifest in expressive and receptive language, such as delayed speech, phonological disorders, sentence formation challenges, inadequate linguistic balance, obstacles in naming and requesting, ineffective gestures, and non-verbal communication (Maghawry, 2023). In receptive language, individuals struggle to understand instructions and questions, may be unresponsive to calls, and demonstrate insufficient attention to spoken language, encompassing verbal and non-verbal cues, signals, gestures, and facial expressions.

Autism manifests in language impairments and barriers to social interaction. Despite scientific advances, children with ASD require tailored and holistic support. Programs such as Applied Behavior Analysis (ABA) facilitate behavior modification and social adaptation.

Jamalal-Khatib (2017) asserts that ABA is among the most effective approaches for altering and teaching human behavior (Midoun, 2019). Applied behavior analysis is a scientific discipline aiming to understand and evaluate human behavior through systematic examination of behavioral antecedents, which include diverse stimuli influencing behavior in terms of frequency, magnitude, and intensity. It also involves analysis of behavior itself and post-behavioral outcomes, particularly via mechanisms of positive and negative reinforcement.

Regarding language, some researchers consider verbal skills a facet of human behavior, termed verbal behavior. This concept falls within the scope of ABA and was first articulated by Skinner in 1957. He emphasized that verbal behavior constitutes a component of ABA. Buchanan and Jane Weiss (2020) noted that Skinner highlighted the inclusion of verbal behavior within the spectrum of human behavior. Skinner focused on expressive language, which encompasses all auditory and non-vocal communication methods,

including imitation, requests, naming, dialogue exchange, and signals, gestures, and facial expressions used for communication (Bouchanan & M, 2020, p. 23).

Fatiha Saeed Nawasir (2017/2018) asserts that ABA programs, through systematic and repetitive training, assist children with autism in enhancing verbal communication, compensating for their limited natural exploration and reduced ability to benefit from daily experiences compared with typically developing children (Nawasir, 2017_2018). Research on ABA programs and verbal behavior indicates their efficacy in improving language skills in children with autism, as evidenced by the studies of Ahmed Mohamed Ahmed (2024), Abeer Abu Al-Majd Mohamed Hassan (2020), Mohammed Reda (2018), and Luis Antonio Pérez-Gonzalez (2020).

Peterson et al. (2024) found that Applied Behavior Analysis (ABA) interventions significantly improved verbal behaviors in children with Autism Spectrum Disorder. Gains were observed in multiple domains, including requesting, labeling, listener responding, intraverbals, and social communication skills, demonstrating the broad effectiveness of ABA in enhancing verbal and communicative abilities.

Within linguistic competencies and verbal behavior, naming behavior, known as "Tact," represents a fundamental pattern. It enables children to articulate stimuli and objects in their environment by naming them. This skill is particularly crucial in early intervention programs for children with ASD, as it supports communication, social interaction, and overall linguistic development. Research by Toumi et al. (2023) demonstrates that children with autism exhibit significant deficits in naming skills without appropriate training, reflecting a notably low level of language proficiency (Toumi, 2023

Naming behavior can be guided and cultivated through ABA techniques. Management involves controlling antecedent stimuli to elicit accurate responses, followed by timely reinforcement to consolidate the desired behavior and reduce inappropriate actions. Numerous studies, including Cihon et al. (2012), and My Savana Bak et al. (2021), demonstrate

the efficacy of ABA programs in enhancing naming skills in children with autism. A comprehensive review of 51 studies conducted between 2000 and 2019 confirmed the effectiveness of naming skill interventions using ABA strategies. These studies highlight significant improvements in children's ability to associate tasks through ABA methodologies, alongside tasks from the Aibles scale. This approach aims to promote comprehensive development of all aspects of naming, including both receptive and expressive components, thereby fostering functional and gradual enhancement of children's language abilities.

2. Problem Statement

Interactions with autistic children reveal significant deficits in language abilities, encompassing both expressive and receptive skills, as well as overall language utilization, particularly in the area of naming. This suggests either inadequate linguistic development, insufficient comprehension of language application, or a reluctance to engage in naming.

The majority of autistic children struggle to articulate the objects in their environment or their desired objects, instead relying solely on pointing to convey their needs and aspirations, particularly when posing straightforward inquiries such as "What is this?" They exhibit distraction and maladaptive behaviors, lacking any attempt, even inadvertently, to name an object, which indicates a deficiency in awareness regarding the expectation to identify any object by name.

The deficiency in naming skills is a key issue for autistic children, adversely impacting their verbal communication and social engagement. Consequently, the issue addressed in this study arises from the following:

How effective is the applied behavior analysis program in developing the skill of naming and in enhancing the ability to generalize gains in children diagnosed with autism spectrum disorder?

3. Research Hypothesis:

The applied behavior analysis approach is useful in increasing naming skills and enhancing the ability to generalize gains in children with autism spectrum disorder.

4. Research Objectives:

The study seeks to assess the efficacy of the Applied Behavior Analysis program and the ABLLS-R scale in enhancing naming skills in children with autism, tracking their progress post-training, and evaluating their capacity to generalize learned skills across various contexts and settings.

5. Fundamental Concepts:

5.1. Definition of Autism Spectrum Disorder:

Autism is a developmental disease that manifests in children prior to the age of three. (AbdelRahman, 2008, p. 16)

Leucaner (1943) was the first to reference autism disorder, characterizing it as "a disorder that manifests in childhood," and noted that various terms have been employed to describe this condition, including autism, rumination, self-closure (self-occupation), autopsychosis, and childhood schizophrenia, in relation to the development of an abnormal ego. (Al-Hadidi, 2005, p. 9)

Kanner characterized autism as a collection of behaviors and manifestations indicative of a syndrome marked by peculiarity. He noted that autistic children, following extensive studies, exhibit social isolation and withdrawal from others, engage in repetitive and stereotypical communication devoid of purpose, and resist changes in routine. He classified this condition as an emotional disorder. (Al-Ismail, 2011, p. 11)

- **Procedural Definition:**

Autism is defined by a range of characteristics, including egocentrism, social detachment, solitary play, attention to specific details, reluctance to communicate—especially visually—engagement in unusual and purposeless actions, along with language impairments and underuse. Managing a child with autism can be very difficult, particularly since symptoms intensify with age in the absence of intervention.

5.2. ABA Program Definition:

- **Terminological definition:**

Asper Rizeigat (2024) states that Applied Behavior Analysis (ABA) is a program designed for skill training and education, grounded in the behavioral analysis of a child's behaviors and responses to environmental stimuli, and relies on conditioning theory through systematic and concurrent reinforcement. (Al-Rzaiqat, 2024)

- **Procedural Definition:**

Applied behavior analysis is a methodology that examines the antecedents of behavior, the behavior itself in response to stimuli, and the consequences of behavior, with the objective of regulating, modifying, and rectifying the actual responses and behaviors by managing their antecedents and consequences.

5.3. Naming Skill Definition:

- **Terminological definition:**

Naming is a component of verbal activity wherein the speaker identifies objects and acts, conveying information through several sensory modalities (sight, hearing, touch, smell, taste). (El-Sayed, 2018, pp. 90-91)

- **Procedural Definition:**

Naming talent refers to the ability to evoke the appropriate term at the opportune moment, influenced by verbal prompts such as "What is this?" and the surrounding contextual stimuli.

6. Research Procedures:

- **Human limits:** A sample of 2 girls and 2 boys with autism spectrum disorder was utilized. At the age of 4, they were deliberately selected to ensure normal IQ, with no concomitant disorders aside from behavioral issues..
- **Spatial limits:** This study was conducted at the Psychological and Pedagogical Center for Children with Intellectual Disabilities – Bougezoul.
- **Time limits:** The study was conducted over a period of four months, including 32 classes, with an average of two classes each week at the center, similar to working at home with parents.
- **Research Tools:**
 - 1- The Childhood Autism Rating Scale (CARS-2) is a tool developed by Schopler and colleagues to assess the severity of autism through 15 behavioral criteria, relying on parent interviews and child observation, and takes 30–45 minutes to administer.
 - 2- ABLIS-R: The ABLIS-R is a comprehensive tool for assessing and tracking the development of basic learning and language skills across

25 domains, identifying strengths and deficits, and guiding skill development.

The following table delineates naming tasks and skills, methods of evaluation, and assessment tasks: This table presents tasks and skills, along with the evaluation method and assessment tasks, showcasing only three tasks as examples from a total of 20.

Task	Task Objective and Question	Performance Assessment	Notes
G1: Naming Reinforcers	The child will name the existing objects, answering the question is: " What is this? "	The child takes the mark: 0=0 labeled/1if naming 2 titles/ 2 if naming 4 titles / 3=6 titles /4=10 titles or more	Enhancers should be the objects he prefers and loves, as well as providing auditory stimuli
G2: Naming Common Objects	Naming 100 objects in the house, answering the question: " What is this? "	1=5 titles /2=10 titles /3=50 titles /4=100 titles	The list from which he will choose must be heard and, in his field, or dealt with repeatedly
G3: Naming Familiar People in His Environment	He calls the people in his house, answering the question, "Who is this?"	1= 2 people/2= 4 people/ 3= 6 people/ 4= 10 people	Takes 0 if not named in all tasks

Table (1): The main tasks in the naming function taken from the Aibles program

- **Statistical methods:** Percentages were used to determine the level of success of developing the naming skill in both pre- and post- test.
- **Stages of study:**

The study included three stages: pre-tests, ABA-based training, and post- tests to test effectiveness:

- **First Stage:** Tribal Test Stage:

Authorization was secured from the center's director and the parents to execute the ABA program with the children and maintain its daily implementation at home. Following the selection of the sample, the CARS scale was utilized to evaluate the severity of autism, succeeded by the ABLLS-R to examine naming abilities, in conjunction with an observation sheet to document responses and associated behaviors. The test was performed in authentic contexts utilizing animal images and models during play, with sessions documented for subsequent analysis. Stimuli were introduced progressively from simple to complex (1–20), with prompts and reinforcements employed to build a baseline for naming proficiency, utilizing around 20 tasks from the 47 in the scale due to the children's restricted language capabilities.

- **Aibles Scale Results:**

The pre-test findings indicated significantly low scores across most dimensions of the ABLLS-R scale, yielding the following outcomes:

In task G1 regarding the identification of reinforcements, we presented the children's preferred objects, comprising 10 objects for each child, thereby placing reliance on parental selection. The children were assigned scores ranging from 0 to 4 points. Upon displaying the actual objects, the children exhibited a desire to acquire them and pointed at them rather than verbalizing their names. Subsequently, we inquired, "What is this?" The boy identified 2 objects, earning 1 point, while the girl identified 4 objects, earning 2 points. In Group 2, after presenting actual objects to the children at home, the mother facilitated the task, as we could not provide 100 common objects that the child had encountered. The child named 20 objects, yielding 1.5 points, and the girl named 15 objects, yielding 1 point. In Group 3, we utilized images of 10 household members; the child named the mother, father, and siblings, earning (3n), while the girl earned (3.5n). In Group 4, after displaying 100 pictures of familiar objects, one child's response involved touching a picture and uttering unintelligible sounds, occasionally producing unclear words. We

recorded (2n) and (1n) in response to the question: What is this? In 5G, we received 3 labels for the child while avoiding eye contact, and he was reiterating the labels for other objects, resulting in (2n) and (1n). However, in G6, during the task of naming cloobject objects, the child provided alternative labels for home usage, such as "shoes," which he referred to as "*sibāṭi*." The term is colloquial rather than Standard Arabic, and he permanently associated the matter with himself, receiving a score of (1n), whereas the girl declined to view the images, expressing boredom and receiving a score of (0n).

For G7 in the task of naming the current familiar activities, that is, the question about the event which is actually happening, and this was done at home with the mother, and we recorded the child (1,5n) and the girl (1n), so that the child recognized the crying event and said "crying", while the fall event said "floor" .. Thus, while the girl was repeating words about the event such as "a child eats" saying "*Makala*" which is a colloquial word. As for the generalization, the children could not generalize; i.e. when presenting the eating event from boy to dog, they did not repeat the same name. As for G8 in the task of naming activities with pictures, we got (0n) for the child and (2n) for the girl, which was referring to pictures only, without naming and muttering unclearly. As for G9 in the task of naming fluently and naming quickly, automatically and without assistance within a short time, the children got (0n), so that there was no fluency and no speed, but rather a repetition of random words and repeating the question more than once, the children were able to name some colors and numbers, but not fluently, so the label does not count correctly. As for the G10, they got (0n) because they could not acquire new labels without training that exceeds 15 repetitions, so that we prepared real and unfamiliar objects such as (shears, needle, vase, cutter, axe...), and we counted them several times before the child's eyes. For instance we ask them to give us the axe or scissors, we repeat it only 4 times, then we ask them to name the axe or scissors, yet they couldn't do it.

In Task G11 with regard to naming professions, when viewing a picture with several objects and events, they could not name a set of words or even signs, but all they did was stare at the pictures and then point with the finger as usual without naming, especially the girl was raising her head and looking

at us as if she was asking for help or clarifying or changing the subject. She got (0n). Concerning Task G12, it was about naming parts of objects or their features, when viewing shapes such as toys and different figures, answering the question: How do we call this part? We point to the wheel or handle and say, What do we hold when we want to open the door? Or what color is this? pointing with the finger, carrying a heavy object with another in parallel and asking: Is this heavy or light? The children was able to name the basic colors and name some of the shapes that they had previously been trained on in the sponsorship classes before, and they got (2n) and (1,5n). In the G13 task about displaying objects, we ask the child "What color is this?" Is this big or small? ", "Is this soft or rough?", "Is the sound loud or quiet?". The two children repeated the instruction and the question, and succeeded only in naming colors and some shapes such as a square and a triangle, they got (2n) and (2,5n), by providing 10 objects and answering 10 questions. As for the G14 task in naming pictures of relationships as explained in the table above, that is, displaying a picture of a ball and a shoe along with extraneous pictures, so that the image of the ball alone with the relevant and extraneous is displayed, and then showing the image of the shoe. We got (1,5n) and (2n), the two children were linking objects according to color and not functional relationship, so that 10 elements were mentioned for each picture. In the G15 task about naming the object while knowing its function, they got (0n), so that each of them was repeating what we say, especially the girl. In the G16 task about naming the object while knowing its features, each of them got (0n). In the G17 task in naming the object while knowing its category, each of them was able to know the dress when asked which of these do we wear? Which of these do we eat with? The boy was pointing with his finger, and then, when repeating the question, he named them " pants" and "lace", and the rest were not recognized. As for the girl, she was only pointing without a label. They got (0n) and (0n). As for task G18 about naming 2 objects when presented together, the child was unable to focus and name each of the 2 pictures, but he was only naming one picture. They got (0n). As for task G19 about naming objects in one picture, the child was able to name objects known to him. They got (1n) and (0n). Finally, in task G20 about naming 2

objects through meaning-bearing sentences, it is required to link with the word "and", each of which was unable to name and got (0n).

Note: Audio stimuli were presented, such as: Sounds of familiar animals asking the question: Whose voice is this? providing tactile, tasteless, and olfactory stimuli.

- **Observation results:**

In the pre-test test, the children showed weakness in naming; they did not initiate responses spontaneously, and their answers were slow and unclear, often in the form of gestures or incomprehensible repetitions. Successful naming attempts were mostly limited to visual stimuli, while distracting behaviors such as escape, poor eye contact, and frequent turning away were observed.

- **Pre-test Score:**

The pre-test results for naming skills revealed significant deficiencies, with the two cases scoring 20n and 15n out of a possible 124 points, corresponding to percentages of 16% and 12%. This indicates a restricted vocabulary and a near-total absence of the generalization process, as both individuals struggled to transition from visual to auditory stimuli, as well as from tactile, olfactory, and gustatory stimuli.

- **Second Stage: Training Stage:**

At this level, we utilized Applied Behavior Analysis (ABA) and modeling (ABC) techniques while applying naming skills in accordance with the ABLIS-R scale criteria. Using the aforementioned methods, we instructed children in naming skills and in the generalization of these gains. During the antecedent stage (A), we trained mothers to implement various stimuli—visual, auditory, etc.—at home, ensuring that the training progressed from simpler to more complex skills, specifically from G1 to G20. Progression to subsequent skills occurred only after the mastery of preceding ones, transitioning to auditory stimuli only after the successful naming of visual stimuli, and similarly for all sensory modalities. Regarding stages (B) and (C), Behavior and Consequence, after eliciting the target behavior or an alternative behavior, we administered the appropriate reinforcers for the child, ensuring that these reinforcers were delivered promptly and that positive and negative reinforcement were not conflated. Positive

reinforcement included applause and verbal praise, such as “Bravo” or physical affection like hugging, may be ineffective for children with autism. For instance, during the initial task of identifying preferred objects, we offer the child a selection of favored objects, such as cars, airplanes, scissors, and bubble bottles. In contrast, another child may favor spoons, dolls, chairs, and tables. We sequentially present these engaging objects and inquire, "What is this?" Upon receiving a correct response, we reinforce it with expressions such as "Bravo" or "Applause." Conversely, in the case of an incorrect label, we provide correction, and for responses that deviate from the designated label, we implement negative reinforcement, which may include frowning or verbalizing that the response is incorrect. We varied our stimuli, utilizing visual stimuli initially, and when feasible, we incorporated auditory stimuli, continuing this approach throughout all tasks up to task 20.

○ **Stage 3:** Post-test stage:

After an intensive training period at the center and at home that lasted 4 months, we then evaluated the naming skills of the two cases, and the results of the Aibles scale and observation were as follows:

● **Aibles Scale Results:**

Skills	Points Child (SB)	Points The child (K.D.)	Skills	Points Child (SB)	Points The child (K.D.)
G1	4n	4n	G11	1n	2n
G2	2,5n	3n	G12	3n	2,5n
G3	4n	3,5n	G13	3,5n	4n
G4	2n	1n	G14	2,5n	3n
G5	3n	4n	G15	2n	2,5n
G6	2n	2n	G16	2n	2,5n
G7	3n	3,5n	G17	2,5n	3n
G8	2,5n	3n	G18	2n	3n
G9	1,5n	2n	G19	1,5n	2n
G10	1n	1n	G20	1n	1n
			Total	47,5n from 124 pts	54,5n from 124 pts
			Percentages	38%	43%

Table (2) represents the total points of the two children in naming skills and percentages

- **Comment on the table:**

It appears in the above table that the children's points ranged from (1n) to (4n), and this translates into ratios estimated at: (38%) and (43%), which reflect the good performance of naming skills in general.

- **Observation Results for Post-test:** In the post-test, children's responses showed clear improvement in quality and speed, with better focus on presented stimuli and direct initiation of naming. Unfocused mumbling and repetitions decreased, while naming occurred from the first prompt. Disruptive behaviors such as ignoring and escaping declined, with improved eye contact and stronger engagement in the naming task.
- **Post-test results:** The results of Table (2) showed a noticeable improvement in naming skills by 38% and 43%, reflecting the development of a significant linguistic repertoire and its use in appropriate situations. There was also progress in generalizing the skill across different sensory modalities (visual, auditory, tactile) and transferring it between situations, which indicates a functional understanding of concepts rather than a mere formal memorization of stimuli.
- **Presentation and analysis of the results:**

Under the hypothesis that states: "The effectiveness of the applied behavior analysis program in developing naming skills and enhancing the ability to generalize the gains of children with autism spectrum disorder," the results of the pre- and post-tests proved that there are clear and meaningful differences in the obtained scores. The lowest score obtained by the two children in the pre-test was (0n) and the highest was (3.5n), while in the post-test the lowest score was (1n) and the highest was (4n), out of a possible range of 0–4n. This progression indicates the development of a significant linguistic balance and the ability to apply it in naming tasks. Improvement in behavioral responses was observed, particularly in the children's reactions to

the stimuli provided, in addition to a clear enhancement in naming skills and an increase in the strength of evocation during naming. Favorable indicators also emerged, including improved attention and the capacity for visual communication. The observed improvements can be explained through the principles of Applied Behavior Analysis, as the employed strategies—including the introduction of varied stimuli and the provision of reinforcement—fulfilled the necessary conditions to enhance desired behaviors such as naming, communication, and attention, which were previously nearly unattainable. While no new linguistic signs were developed, the existing signals became more automatic, making our study consistent with the findings of Luis Antonio Pérez-Gonzalez (2020), who demonstrated that the use of Applied Behavior Analysis strategies is effective in promoting the emergence of verbal skills such as naming, (Pérez-Gonzalez, 2020) and the study of Gladys Williams 2006, which proved that there is an effectiveness of the behavior analysis program applied in the emergence of automatic language in natural situations, by relying on verbal stimuli, that is, the behavioral transition from the triggered naming with discriminatory and verbal stimuli to proactive automatic behavior, as the data proved that ABA strategies contributed to reducing undesirable behaviors. (Gladys Williams, 2006)

This makes our study compatible with the study of Cihon et al 2012, which proved that training on naming skills by applying ABA procedures, especially the use of differential and positive reinforcement methods, leads to the reduction of behaviors associated with the naming process, such as purposive verbal repetitions, and that the appropriate naming skill may work as a competing response to stereotypical behaviors, that is it occupies the child and reduces undesirable behavior. (Cihon, 2012)

The results of many studies also claim that the sequence of acquisition naming is starting from high-frequency stimuli in the daily environment, and then gradually moving to less familiar or abstract stimuli, such as a study where the results showed a variation in the ratios from the first to the last tasks, and a gradual improvement was observed in the ability of children to respond verbally to different environmental stimuli, and the growth of

naming skills was gradual from easy to difficult, as it was found that the initial skills, especially those associated with stimuli that are familiar or loved by children, were easier to acquire and more stable in performance compared to new or unfamiliar skills.

The data also showed that the generalization of skills to new situations or stimuli was less automatic, which indicates the need to design additional interventions to support verbal generalization in natural environments, so that our results were compatible with the study of Lablanch & Santter (2007) which proved that the generalization process was limited and that there is difficulty in applying naming skills to other categories that were not trained. (Santter, 2007)

Our study is in contrast with the research by Norma R Schnell et al. (2018), which proves that the application of applied behavior analysis strategies through sequential training and simultaneous training is effective in developing and improving naming and acquiring generalization skills. (Norma R, 2018)

As for the generalization of the gains from naming skills through diversification in sensory inputs, the results showed that children were able to respond to non-visual discriminatory stimuli such as auditory, tactile, olfactory and taste stimuli, however, the rates of improvement remained relatively limited and weak compared to visual stimuli. This is because these types of stimuli require deeper sensory processing and more sophisticated linguistic abilities. The lack of exposure and repetition of these stimuli daily in natural sensory contexts contributes significantly to reducing their generalization. This makes our study relatively consistent with the Madisyn Quidort (2022) research, which proved that there is a generalization of naming from external discriminatory stimuli to internal stimuli such as ting, pain and cold, where some children were able to generalize directly provided that the object is visible and provided that children are taught to name special events such as distress, heat and cold, provided that these events resemble previously learned general stimuli. This is called generalization from visual stimuli to invisible stimuli, and from general stimuli to special ones. (Quidort, 2022)

7. Conclusion:

The Applied Behavior Analysis (ABA) method has demonstrated efficacy in cultivating naming skills and their associated components in children with moderate autism spectrum disorder. The findings indicate that the systematic and intentional presentation of stimuli, along with the prompt delivery of reinforcers, enhances the development of naming skills. It also mitigates maladaptive behaviors and improves the child's capacity to generalize learned abilities in novel contexts. This corroborates the study's hypothesis and validates the efficacy of the ABA program in enhancing language abilities in children with autism spectrum conditions.

Nonetheless, certain limitations must be acknowledged. The limited sample size constrains the generalizability of the findings, and the case study approach precludes extensive causal inferences. Future research should prioritize larger and more representative sample sizes, as well as long-term monitoring of skills to evaluate their acquisition and consistent generalization.

The theoretical and practical significance of this study is rooted in the assertion that Applied Behavior Analysis (ABA) provides a methodical and precise framework that supports the progressive enhancement of language skills. These findings underscore the importance of personalized interventions utilizing targeted reinforcement in the early education of children with autism spectrum disorder.

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