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RESEARCH ARTICLE

An Empirical Investigation of Tact (Verbal Naming) Skills in Children with Autism Spectrum Disorder: A Descriptive Study Based on Skinner's Verbal Behavior Framework

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Abstract
Verbal communication impairments represent one of the core diagnostic features of Autism Spectrum Disorder (ASD), with particular deficits observed in functional language use. Among the components of verbal behavior conceptualized within Skinner's behavioral framework, tact—defined as the ability to verbally label objects, events, or stimuli present in the environment—plays a pivotal role in facilitating social interaction and shared attention. The present study aimed to examine the level of tact (verbal naming) skills among children diagnosed with Autism Spectrum Disorder in the Algerian provinces of Ghardaia and Setif. A descriptive research design was employed to address the study objectives. The sample consisted of 56 children with ASD, aged between 5 and 13 years, who were enrolled in specialized educational and rehabilitation centers. Data were collected using a standardized verbal communication skills scale specifically designed to assess naming abilities. Statistical analyses were conducted using appropriate descriptive and inferential methods at a significance level of 0.05. The findings revealed that the overall level of tact skills among the participating children with ASD was significantly low. Moreover, the results indicated no statistically significant differences in verbal naming performance attributable to age. These findings suggest that deficits in tacting persist across different childhood stages in individuals with ASD, highlighting the need for early, systematic, and functionally oriented language interventions grounded in behavioral principles. The study underscores the importance of incorporating tact training within educational and therapeutic programs for children with autism spectrum disorder, as enhancing verbal labeling skills may contribute to improved communicative competence and social responsiveness.

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1. Introduction

Autism Spectrum Disorder (ASD) is among the most pervasive neurodevelopmental disorders affecting essential domains of early human development. It has attracted considerable scholarly attention within the fields of psychology, special education, and speech-language pathology due to its early onset and profound impact on communication, social interaction, and adaptive functioning. ASD typically manifests during the early developmental stages of life and is characterized by persistent deficits in social communication and social interaction, alongside restricted, repetitive patterns of behavior, interests, or activities (Bernier & Gerdts, 2010).

One of the most prominent and challenging features of Autism Spectrum Disorder is impairment in language development and functional communication. Empirical evidence suggests that a substantial proportion of children with ASD either fail to develop spoken language altogether or acquire it in a highly limited and rudimentary form. Tager-Flusberg and Kasari (2013) report that many children with ASD exhibit atypical language characteristics, including echolalia, inappropriate pronoun use, repetitive and non-contextual speech, as well as abnormalities in prosody, intonation, and rhythm. Moreover, these children often struggle to acquire the semantic and syntactic structures necessary for meaningful language use (Eissa, 2015). As a result, even when some degree of language is acquired, it frequently remains functionally ineffective for social communication and interaction.

Further research indicates that children with ASD often do not use language as a tool for social engagement. When verbal communication does occur, it is commonly restricted to instrumental purposes, such as making requests or expressing immediate needs and desires (Mody & Belliveau, 2013). This limited functional use of language reflects a weak association between verbal behaviors and their reinforcing outcomes. Children with ASD tend to exhibit difficulties in understanding the reciprocal relationship between verbal behavior and its social consequences, which hinders the natural development of communicative competence.

To explain these language-related deficits, Skinner's behavioral approach to language acquisition provides a valuable theoretical framework. In his seminal work *Verbal Behavior* (1957), Skinner conceptualized language as a form of learned behavior shaped and maintained by environmental variables, particularly antecedent stimuli and reinforcement. Rather than focusing on the structural or formal properties of language, Skinner emphasized its functional aspects, shifting the analytical focus from *what* is spoken to *why* it is spoken. From this perspective, verbal behavior is understood as operant behavior that emerges through interaction with the environment and is regulated by its consequences (Skinner, 1957).

Within the Verbal Behavior framework, language is systematically classified into distinct functional categories, commonly referred to as verbal operants. These include echoic behavior (echoing), manding (requesting), tacting (labeling), and intraverbal behavior (conversing). Each verbal operant is defined by a specific relationship between antecedent stimuli, verbal responses, and reinforcing consequences. Echoic and intraverbal behaviors primarily involve verbal interactions with others, whereas manding and tacting are closely linked to the individual's direct interaction with the environment and personal experiences.

Among these verbal operants, tacting occupies a central role in language development. According to Skinner (1957), a *tact* is a verbal response emitted in the presence of a non-verbal stimulus, such as an object, event, or action, and is typically reinforced through social consequences. Sundberg (2015) emphasizes that tacting is one of the most critical components of verbal behavior, as it enables individuals to label and describe their environment, thereby facilitating shared attention and social exchange. For example, when a child observes an object and labels it verbally (e.g., "cat"), the listener's social response ("Yes, that's a cat") reinforces the behavior and strengthens communicative interaction.

Tacting plays a fundamental role in social communication by providing listeners with meaningful information that supports interaction and shared understanding. This can be illustrated in social play contexts, such as when one child states, "The baby is hungry," during pretend play, prompting another child to respond appropriately by extending the scenario (e.g., offering a bottle). Through such exchanges, tacting serves as a foundation for cooperative play, social reciprocity, and language-mediated interaction.

Sundberg (2015) further asserts that tacting skills form the basis for the development of other verbal operants, including manding, echoing, and intraverbal behavior. In neurotypical development, these verbal processes emerge naturally and sequentially as children interact with their environment. However, in children with Autism Spectrum Disorder, this developmental trajectory is often disrupted. Research by Karmali, Greer, Nuzzolo-Gomez, and Ross (2005) highlights that children with ASD exhibit significant delays and deviations in the acquisition of verbal operants, particularly those requiring spontaneous and socially mediated language use.

In light of these considerations, the present study seeks to examine spoken language from a functional perspective, focusing specifically on verbal behavior and, more precisely, on tacting ability. By evaluating the level of tacting skills among children with Autism Spectrum Disorder, this study aims to contribute to a deeper understanding of functional language deficits within this population and to inform evidence-based educational and therapeutic interventions.

1.1 Research Questions

The present study is guided by the following research questions:

- What is the level of tacting ability among children with Autism Spectrum Disorder in the study sample?

- Are there statistically significant differences, at the 0.05 significance level, in tacting ability attributable to age among children with Autism Spectrum Disorder?

1.2 Research Objectives

The primary objectives of the current study are as follows:

- To administer a standardized scale designed to assess tacting (verbal naming) ability among children with Autism Spectrum Disorder.

- To measure and analyze the level of the naming (tact) variable within the study sample.

1.3 Importance of the Study

The significance of the present study can be articulated across two primary dimensions:

Theoretical Significance

This study contributes to the theoretical literature on verbal behavior by examining tacting ability within the context of Autism Spectrum Disorder. It enhances understanding of functional language deficits through the application of Skinner's Verbal Behavior theory, thereby enriching behavioral and linguistic research related to ASD.

Practical Significance

From a practical standpoint, the study offers empirical support for the use of structured assessment tools to evaluate tacting skills in children with ASD. The findings may inform educators, therapists, and practitioners in designing targeted intervention programs aimed at improving functional communication and social interaction.

1.4 Operational Definitions

- **Autism Spectrum Disorder (ASD):** In the context of this study, Autism Spectrum Disorder refers to children diagnosed with ASD ranging from mild to moderate severity, as determined by the Childhood Autism Rating Scale (CARS). The participants' ages range from 5 to 13 years.

Verbal Behavior In the context of the present study, *verbal behavior* refers to the spoken verbal responses exhibited by children within the study sample. These behaviors include the child's ability to produce sounds, words, or verbal expressions for various functional purposes, such as imitation (echoic behavior), self-expression, requesting (manding), or labeling stimuli (tacting) present in the surrounding environment. Verbal behavior, as conceptualized within Skinner's theoretical framework, serves as a primary means through which children interact socially and communicate meaningfully with others.

Tacting
Tacting refers to a child's ability to spontaneously and verbally label objects, events, or stimuli encountered in their environment without external prompting. This verbal response is emitted solely for the purpose of socially sharing

information rather than obtaining a tangible reward. In the current study, tacting ability is operationally defined as the level of performance achieved by a child with Autism Spectrum Disorder on the tacting scale employed for assessment.

2. Methodology

2.1 Research Method and Design

To achieve the objectives of the present study, a **descriptive research methodology** was adopted. This approach is appropriate for examining phenomena as they naturally occur, without manipulation of variables, and allows for the systematic description and analysis of observed characteristics. The descriptive method facilitates both quantitative and qualitative representations of the phenomenon under investigation, enabling a comprehensive understanding of tacting abilities among children with Autism Spectrum Disorder (Abidet, Ades, & Abdelhak, 2005).

2.2 Research Population and Sampling

The target population of this study consists of children who have received a formal clinical diagnosis of Autism Spectrum Disorder (ASD) and who are enrolled in educational, medical, or rehabilitation institutions located in the administrative regions of **Ghardaia and Setif, Algeria**.

A **purposive sampling technique** was employed to select participants who met the study's inclusion criteria. The final sample comprised **56 children with ASD**, aged between **5 and 13 years**. Children younger than 5 years or older than 13 years were deliberately excluded to ensure developmental homogeneity and methodological consistency.

The sample included both male and female participants and was drawn from several specialized institutions and centers. The distribution of participants according to institution, gender, and percentage is presented in Table 1.

Table 1. Distribution of Children with Autism Spectrum Disorder in the Study Sample

Place	Males	Females	Total	Percentage
Dar Al-Ihsan Psychopedagogical Center, Attaf (Ghardaia)	08	02	10	17.85%
Latif Challenge Association for Autism (Setif)	07	03	10	17.85%
Al-Rahmat Psychopedagogical Center, Benoura (Ghardaia)	05	02	07	12.50%
Bouachoura Draji Hospital (Setif)	03	01	04	7.14%
Hadi Clinic (Setif)	06	02	08	14.28%
Khababa Abdelwahab Primary School (Setif)	04	03	07	12.50%
Psychopedagogical Center for Mentally Disabled Children (300), Setif	05	05	10	17.85%
Total	**38**	**18**	**56**	**100%**

Description of the Study Sample

As illustrated in Table 1, the total study sample consisted of **56 children diagnosed with Autism Spectrum Disorder**, aged between **5 and 13 years**. The participants were distributed across multiple institutions in the regions of Ghardaia and Setif.

Specifically, 10 children (17.85%) were enrolled at the Dar Al-Ihsan Psychopedagogical Center in Ghardaia, while another 10 children (17.85%) were selected from the Latif Challenge Association for Autism in Setif. The Al-Rahmat Psychopedagogical Center in Ghardaia contributed 7 children (12.5%), and Bouachoura Draji Hospital in Setif accounted for 4 children (7.14%). Additionally, 8 children (14.28%) were recruited from the Hadi Clinic in Setif, 7 children (12.5%)

from Khababa Abdelwahab Primary School in Setif, and 10 children (17.85%) from the Psychopedagogical Center for Mentally Disabled Children (300) in Setif.

The sample comprised **38 males and 18 females**, reflecting the higher prevalence of Autism Spectrum Disorder among males reported in the literature.

2.3 Research Instruments

To achieve the objectives of the present study, the **Verbal Communication Scale** grounded in **Skinner's Verbal Behavior Theory** was employed. This scale was developed by **Dr. Ahmed Kharoubi (2022)** as part of the requirements for obtaining a doctoral degree in Special Education and Adapted Education. The original research was entitled *"The Effectiveness of a Training Program to Improve Communication Skills in Children with Autism."*

The scale is designed to assess functional verbal communication abilities in children with Autism Spectrum Disorder and consists of **42 items** distributed across four dimensions, each representing a major verbal operant within the Verbal Behavior framework:

- **Dimension One: Repetition (Echoic Behavior)** – 9 items
- **Dimension Two: Request (Mand Behavior)** – 11 items
- **Dimension Three: Naming (Tact Behavior)** – 9 items
- **Dimension Four: Conversation (Intraverbal Behavior)** – 13 items

Method of Responding

The scale is completed by the caregiver or specialist responsible for the child. Responses are recorded by placing a mark (×) next to the option that best reflects the child's typical verbal behavior. Each item is rated on a five-point Likert scale with the following response alternatives:

- Always
- Often
- Sometimes
- Rarely
- Never

Scoring System

For the purposes of the present study, the response options were assigned weighted scores as follows:

- **Always** = 5 points
- **Often** = 4 points
- **Sometimes** = 3 points
- **Rarely** = 2 points
- **Never** = 1 point

Higher scores indicate a higher level of verbal communication proficiency.

2.4 Psychometric Properties of the Scale

To ensure the scientific rigor of the measurement tool, its **validity** and **reliability** were examined.

2.4.1 Validity

Validity refers to the extent to which the instrument accurately measures the construct it was designed to assess.

Internal Consistency Validity

Internal consistency was evaluated by calculating correlation coefficients between each item and the total score of the scale. The results indicated that:

- Most items demonstrated statistically significant correlations with the total scale score at the **0.01 level**,
- The remaining items showed statistically significant correlations at the **0.05 level**,
- Correlation coefficients between each dimension (Repetition, Request, Naming, Conversation) and the total score were statistically significant at $p \leq 0.01$.

These findings confirm that the items are internally consistent and adequately represent the construct of verbal communication.

Discriminant Validity

The Verbal Communication Scale demonstrated an acceptable level of discriminant validity, indicating its ability to differentiate between varying levels of verbal communication performance among children with Autism Spectrum Disorder.

2.4.2 Reliability

Reliability refers to the degree to which the instrument produces stable and consistent results.

- **Cronbach's Alpha Coefficient:** The overall reliability coefficient reached **0.87**, indicating a high level of internal consistency.
- **Split-Half Reliability:** Using the Guttman Split-Half method, the reliability coefficient reached **0.978**, further confirming the stability and reliability of the scale.

2.5 Statistical Tools for Data Analysis

2.5.1 Statistical Processing

The collected data were statistically analyzed using the **Statistical Package for the Social Sciences (SPSS), version 22**.

2.5.2 Statistical Methods Used

Statistical methods were selected in accordance with the study objectives and sample characteristics:

- **Sample size:** 56 children with Autism Spectrum Disorder
- **Single-Sample t-Test:** This test was employed to:

- Compare the observed mean score of the study sample on the **Naming (Tact) dimension** with the hypothetical mean,
- Examine differences in naming ability according to the **age variable**.

All analyses were conducted at a **significance level of 0.05**.

3. Results and Discussion

3.1 Results Related to the First Research Question

The first research question sought to determine:

"What is the level of naming (tacting) ability among children with Autism Spectrum Disorder in the study sample?"

To answer this question, the following hypothesis was formulated:

"The level of naming among children with Autism Spectrum Disorder in the study sample is average."

A **single-sample t-test** was conducted to test this hypothesis by comparing the empirical mean score of the sample with the hypothetical mean of the Naming dimension.

Table 2. Results of the Single-Sample t-Test for the Naming Dimension

Degree of Freedom	Standard Deviation	Arithmetic Mean	Hypothetical Mean	Significance Level	Sig.	t-value
55	6.540	13.26	27	0.05	0.000	-14.248

Interpretation of Results

Table 2 indicates that the **hypothetical mean** for the Naming (Tact) dimension is **27**, whereas the **observed arithmetic mean** for children with Autism Spectrum Disorder in the study sample is **13.26**. The calculated t-value (-14.248) is statistically significant at **p = 0.000**, which is well below the adopted significance level of **0.05**.

These results demonstrate a statistically significant difference between the observed mean and the hypothetical mean, indicating that the level of naming ability among children with Autism Spectrum Disorder in the study sample is **significantly lower than average**. Accordingly, the research hypothesis is **rejected**, and it can be concluded that children with ASD in the present sample exhibit marked deficits in tacting skills.

Discussion

The low level of naming ability observed among children with Autism Spectrum Disorder is consistent with prior research highlighting fundamental impairments in functional language use within this population. From the perspective of Verbal Behavior theory, tacting requires spontaneous verbal responses under non-verbal stimulus control and socially mediated reinforcement—conditions that pose significant challenges for children with ASD.

These findings align with the work of Skinner (1957), Sundberg (2015), and Tager-Flusberg and Kasari (2013), who emphasize that deficits in tacting reflect broader limitations in social attention, symbolic representation, and environmental responsiveness. The results further underscore the importance of early, structured interventions targeting tact development as a foundational component of functional communication and social interaction in children with Autism Spectrum Disorder.

3. Results and Discussion (Continued)

The obtained **t-value was negative (t = −14.248)**, indicating that the arithmetic mean of the study sample on the Naming (Tact) dimension is **significantly lower** than the hypothesized mean for this dimension. This negative value confirms the direction of the difference, demonstrating that the observed level of naming ability among children with Autism Spectrum Disorder is below the expected average level.

Accordingly, the null hypothesis stating that *"the level of naming among children with Autism Spectrum Disorder in the study sample is average"* is **rejected**, and the alternative hypothesis is **accepted**, which states that *"the level of naming among children with Autism Spectrum Disorder in the study sample is less than average."*

3.2 Results Related to the Second Research Hypothesis (Age Variable)

The second hypothesis of the study stated:

"There are statistically significant differences at the 0.05 significance level in the level of verbal behavior (naming) attributable to the age variable in the study sample."

To test this hypothesis, the arithmetic means of the Naming dimension on the Verbal Communication Scale were calculated for three age groups within the study sample. The results are presented in Table 3.

Table 3. Arithmetic Means of Naming Scores According to Age Group

Degree of Freedom	F-value	Sig.	Mean Score	Age Group
55	2.317	0.111	12.55	5–7 years
			12.08	8–10 years
			18.00	11–13 years

Interpretation of Results

As shown in Table 3, the mean score for the Naming dimension was **12.55** for children aged **5–7 years**, **12.08** for those aged **8–10 years**, and **18.00** for the **11–13 years** age group. Although there appears to be a numerical increase in the mean score for the oldest age group, the calculated significance level (**Sig = 0.111**) exceeds the adopted threshold of **0.05**.

These results indicate that the observed differences in naming scores across age groups are **not statistically significant**. Therefore, the hypothesis asserting the presence of statistically significant age-related differences in naming ability is **rejected**, and the alternative hypothesis is **accepted**, which states that *there are no statistically significant differences at the 0.05 level in naming ability among children with Autism Spectrum Disorder based on age.*

Discussion of the Findings

The absence of statistically significant age-related differences in naming ability can be interpreted through several theoretical and empirical considerations grounded in Verbal Behavior theory and autism research.

First, according to Skinner (1957), tacting is a verbal operant that occurs in response to non-verbal environmental stimuli and is primarily reinforced through **social reinforcement**. For example, when a child sees a ball and verbally labels it as "ball," reinforcement typically takes the form of a social response from the listener, such as praise or acknowledgment. This social reinforcement strengthens the association between the stimulus and the verbal response.

Second, the interactive and social characteristics of children with Autism Spectrum Disorder present a significant barrier to the acquisition of tacting skills. Research by Chevallier et al. (2012) demonstrates that individuals with ASD show reduced sensitivity to social stimuli and social reinforcers, such as facial expressions, eye contact, and vocal feedback. Instead, they tend to prefer predictable and tangible reinforcers that do not vary across contexts. While social stimuli can sometimes be paired with tangible reinforcers, social reinforcement alone is often insufficient to sustain learning.

This interpretation is further supported by the findings of Savana Bak et al. (2021), who argue that teaching naming skills to children with ASD in naturalistic settings is particularly challenging. Unlike manding, where reinforcement is concrete and directly related to the child's request (e.g., receiving a desired object), tacting is motivated by the desire to **share information** with others. Reinforcement in tacting occurs only when the listener responds socially, making it inherently more complex for children with ASD, who may lack intrinsic motivation for social sharing.

From a behavioral learning perspective, skill acquisition occurs through operant conditioning, whereby a response is strengthened by consistent and meaningful reinforcement. However, in the case of tacting, children with ASD often fail to form stable stimulus–response–reinforcement associations due to their difficulty in processing and valuing social reinforcement. As a result, procedural learning of naming remains impaired regardless of chronological age.

Therefore, the findings of the current study suggest that the acquisition of naming skills in children with Autism Spectrum Disorder is **not age-dependent**, but rather contingent upon the child's ability to engage with and benefit from social reinforcement. Without systematic intervention strategies that effectively pair social reinforcement with meaningful outcomes, deficits in tacting are likely to persist across developmental stages.

4. Conclusion

Naming (tacting) is one of the most significant areas of deficit observed in children with Autism Spectrum Disorder, reflecting broader impairments in functional communication and social interaction. The results of the current study demonstrate that children with ASD exhibit a significantly low level of naming ability and that this deficit does not vary significantly with age.

These findings highlight the tendency of children with ASD to rely on repetitive behaviors reinforced by tangible and predictable outcomes, a pattern that extends to their verbal communication. Because naming is primarily maintained through social reinforcement, its acquisition is particularly challenging for this population. The study confirms that deficits in tacting are closely linked to the social and communicative characteristics of Autism Spectrum Disorder rather than developmental maturation alone.

Based on these findings, the study recommends the following:

- Greater attention should be devoted to verbal behavior—particularly naming—in future research and clinical practice through the development and application of specialized assessment tools for children with ASD.

- Conducting correlational studies examining the relationship between naming and other verbal operants (e.g., manding, echoic, intraverbal behavior) in children with Autism Spectrum Disorder.

- Investigating the relationship between naming ability and both verbal and non-verbal communication skills to better inform comprehensive intervention programs.

Ethical Considerations

This study was conducted in accordance with recognized ethical standards for research involving human participants. Approval was obtained from the relevant institutional authorities, and informed consent was secured from the parents or legal guardians of all participating children. Confidentiality and anonymity were strictly maintained throughout the research process, and participation was entirely voluntary, with the right to withdraw at any stage without consequences.

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Author Contributions

- **Ouchene Nadia:** Conceptualization of the study, data collection, statistical analysis, and manuscript drafting.

- **Kharoubi Ahmed:** Methodological supervision, theoretical framework development, and critical revision of the manuscript.

- **Benamor Nor Elhouda:** Literature review, interpretation of results, and language editing.

All authors have read and approved the final version of the manuscript.

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Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of this article.

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