

The Spoken Language of Learners with Autism: A Microstructural Approach

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ABSTRACT: This research analyzed the spoken language of selected learners diagnosed with Autism in Nueva Ecija using a Microstructural analysis. Overall, there were seven autism spectrum disorder (ASD) participants in Bongabon, Cabiao, and San Jose City, Nueva Ecija. Upon the consent of their parents and guardians, they were recorded for one week to gather their spoken language. Afterwards, their recorded spoken language was tabulated in terms of the grammatical approach, grammatical complexity, and lexical diversity. Using Microstructural analysis, this research concluded that among the seven participants in this study, Participant 5 was the most grammatically complex learner; while Participants 1 and 6 were the most language productive and lexically diverse. The parents and guardians of the participants were also interviewed. To validate and triangulate the results of the recording with the interview, the researcher sought the help of experts in the field of Psychology and Linguistics. A course outline was proposed as an output for this research set to develop and monitor the progress of the participants. It is essential that the teachers ensure that the topics provided for the learners follow through the age of equivalent set by Miller (1981) which ranges from <18 to 24 months. Hence, the proposed course outline contains a series of activities with goals for learners to (1) demonstrate basic speaking skills necessary to communicate with their environment; (2) use a range of lexical items to construct sentences and provide basic function; and (3) demonstrate appropriate social behaviors in speaking. It is recommended that their teachers begin teaching these learners with phonology, followed by morphology and syntax before proceeding to discourse.

KEYWORDS: Autism, microstructural analysis, spoken language, course outline, Age of Equivalent

I. INTRODUCTION

Noam Chomsky (1968) defined language as the “human essence”; a distinctive quality that only we—human beings— possess. In fact, in Africa, a newborn baby is called a *kintu*— “a thing”; and is only called a *muntu*— “a person” once it develops a language. Fromkin, Rodman, and Hyams (2014) further reiterate that language is a source of human life and power and that in order for a society to be understood, the nature of language must continue to be comprehended. From babbling to constructing discourse, language acquisition has been an integral part of a learner’s growth and development. Wagner (1997) further describes language acquisition as the capability of humans to acquire language often represented in the brain.

However, sometimes, language acquisition is more difficult for learners caused by certain language disorders such as autism spectrum disorder or ASD.

ASD is usually first diagnosed in children aged from two to three years old; while there are children with autism that develop normally until toddlerhood when they stop acquiring or lose previously gained skills. It is a developmental disorder often associated with persistent deficits in social communication and interaction such as restricted repetitive patterns of behavior, interests, or activities (APA, 2013). It is a medical condition that has always been present in many countries including the Philippines.

With the difficulty of understanding and decoding the language, ASD learners also have a hard time communicating— whether verbal or non-verbal. According to the National Institute on Deafness and Other Communication Disorders (2020), the ability of ASD learners to communicate and use the language largely depends on their intellectual and social development. While some ASD learners have very limited speaking skills, some may have rich vocabularies, and be able to talk about specific subjects in great detail. These difficulties, when combined, affect the ability of learners with ASD to interact with other people.

It is therefore essential for ASD learners to be taught to improve their communication skills so they can reach their maximum potential. While there is no one- size-fits-all approach when it comes to the best treatment program for ASD learners, the program must be highly structured and specialized to their needs that address their behavior as well as communication skills where aside from teachers, the parents or the primary caregivers of the ASD learners—and even their environment—are involved.

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However, if they are to be combined with deaf and mute patients- for example- how can their language and communication skills develop? Moreover, how can the implementation of inclusive education in the Philippines help in filling the gap of a well-rounded curriculum for learners under the Autism Spectrum?

This study entitled; “The Spoken Language of Learners with Autism: A Microstructural Approach” evaluates the current situation of ASD learners in Nueva Ecija. Specifically, this study analyzes the spoken language of learners with Autism by a deeper understanding of the learners’ language productivity, grammatical complexity, and lexical diversity. Through this, the researcher hopes to propose an intervening resolution through a course outline that specifically caters to the needs of learners diagnosed with Autism.

II. LITERATURE REVIEW

Autism was first described by Kanner (1943, as cited in Lucero, 2017), who identified distinct behaviors among 11 children initially diagnosed with mental retardation and schizophrenia, coining the term early infantile autism. Asperger (1944) later formally recognized autism as a disorder. The term autism, introduced by Bleuler in 1910, originates from the Greek *autos* meaning “self,” while spectrum denotes the range of impairments and syndromes associated with the condition. Core characteristics include social and communicative deficits, often accompanied by comorbidities such as behavioral problems, anxiety, depression, sleep and eating disorders, hyperactivity, and delayed language acquisition (Ali, Al-Adwan, & Al-Naimat, 2019).

Adams (2011) characterized autism as a neuropsychiatric disorder marked by persistent impairments in social interaction, communication, and behavior, along with restricted and stereotyped interests. The DSM-5 (American Psychiatric Association [APA], 2013) outlines diagnostic criteria: (a) persistent deficits in social communication across contexts; (b) restricted and repetitive behaviors or interests; (c) onset during early childhood; (d) significant impairment in daily functioning; and (e) symptoms not better explained by intellectual disability or global developmental delays. Diagnosis requires at least six indicators. Early identification is critical, as delays in social interaction and language within the first three years often deviate from expected developmental patterns. Early intervention thus improves prognosis. Brentani, Bordini, and de Paula (2013) noted that, beyond communication difficulties, infants may present irritability, atypical responsiveness, altered activity levels, and motor delays.

Speech-language pathologists play a central role in intervention, conducting communication assessments and designing treatment programs. Despite pervasive difficulties, children with ASD may also display exceptional strengths in mathematics, the arts, or music (Davidson, Hopkins, Kring, & Neale, 2010).

Children with ASD frequently develop word recognition skills but demonstrate poor reading comprehension (Smith, 2017). This discrepancy reflects a focus on linguistic details and difficulty applying background knowledge to interpret ambiguous language (Wahlberg & Magliano, 2010; Cronin, 2014). Davidson et al. (2010) further noted that although early signs of ASD may appear in infancy, symptoms typically intensify around age two.

Inclusive education has been institutionalized in the Philippines through the United Nations, the Department of Education, and the Commission on Higher Education, integrating learners with additional needs—including those with ASD—into mainstream classrooms. These initiatives were regarded as progressive until disrupted by the COVID-19 pandemic. Estrada (2003), in Senate Bill No. 618 (An Act of Establishing a Center for Autism), estimated that one in 500 Filipinos is affected by autism, though only 10% are formally diagnosed. Estrada emphasized that inadequate government support perpetuates the marginalization of individuals with ASD.

Lucero’s (2017) phenomenological study of Filipino mothers raising children with autism in Cavite identified effective parenting techniques—progressive, reform, and warmth parenting—highlighting autonomy, conscientiousness, improved sociability, and moderated aggression as positive outcomes. In a related study, Chepngetich, Ng’eno, and Sanga (2022) examined parents in Mandaue City, finding coping mechanisms centered on daily struggles, emotional support, and access to information.

Policy efforts have also emerged. The National Autism Care Plan Act, authored by Representative Tomasito Villarin, seeks to establish supportive environments to foster independence and productivity among individuals with ASD (Autism Society Philippines, 2019). The Act includes the creation of the Autism Council of the Philippines, tasked with implementing a long-term national plan. The Autism Society also spearheads the annual National Autism Consciousness Week to promote awareness and advocacy.

Writing development can be studied through microstructural features such as productivity, grammatical complexity, and lexical diversity (Hall-Mills, 2010). Productivity refers to word formation and grammar use (Palmer, 2015), grammatical complexity reflects language quality and development (Lan, Liu, & Staples, 2019), and lexical diversity measures the variety of words used in discourse (Halliday, 1985, as cited in Johansson, 1995).

Several studies examined microstructure in expository writing among typically developing learners. Morris and Crump (1982, as cited in Hall-Mills, 2010) found that syntactic density provided deeper insights into syntax quality, while mean length of T-unit

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and type/token ratio were sensitive to developmental differences in learners aged nine to fifteen. Scott and Windsor (2000) compared narrative and expository writing among 60 participants, concluding that narratives elicited higher performance in most microstructure variables, with no significant differences in grammatical error rates. Houck and Billingsley (1989) studied learners in grades four, eight, and eleven, finding significant grade-level effects in T-units, spelling, and lexical diversity, suggesting developmental growth in productivity and lexical diversity.

Although these studies document developmental trajectories in typically developing learners, research remains limited to the microstructural analysis of spoken texts produced by students with ASD. Addressing this gap is central to the present study.

III. METHODOLOGY

This study employed a qualitative descriptive design using microstructural analysis to examine the spoken language of learners diagnosed with autism spectrum disorder (ASD). The design focused on identifying language productivity, grammatical complexity, and lexical diversity, allowing for an in-depth analysis of naturally occurring language use. Purposive sampling, a form of nonprobability sampling, was used to select participants who could provide relevant linguistic data.

The study was conducted in Nueva Ecija, specifically in the municipalities of Bongabon, Cabiao, and San Jose City. Despite the researcher's effort to include participants from all districts, only parents and guardians from these three locations consented to participate. In total, seven ASD learners, ranging in age from five to thirty, were included. They were either enrolled or not enrolled in SPED or inclusive education programs, depending on family resources and access to services.

The participants varied widely in social backgrounds, educational exposure, and therapeutic interventions. One participant, a 14-year-old male from San Jose City, had been diagnosed with ASD at age three and, though currently enrolled in SPED and attending therapy, could only produce short, grammatically inconsistent phrases. Another participant, a 28-year-old male from Cabiao, had minimal access to interventions and remained unable to construct simple sentences. A ten-year-old male from San Jose had previously attended speech and occupational therapy but showed limited sentence construction. A six-year-old from Bongabon was newly diagnosed and enrolled in occupational therapy, with plans for future SPED placement. Finally, three siblings from Cabiao, aged 22, 17, and 11, presented varying abilities: the eldest, with some therapy and mainstream schooling experience, could form simple sentences and manage daily tasks; the second displayed strong interest in singing but had limited conversational ability; and the youngest, with no therapy history, was the most reserved. These profiles reflect the diversity of linguistic and social contexts within which ASD learners develop. Distribution of participants is shown below.

Location	Participant No.	Sex	Age
Bongabon	4	M	6
	2	M	28
Cabiao	5	F	22
	6	F	17
	7	M	14
San Jose	1	M	14
	3	M	10

Data collection employed three primary instruments: (1) a recording device worn by the learners to capture spoken language over one week, (2) guided interview questions for parents and guardians, and (3) an observation guide created by the researcher to help caregivers monitor productivity, grammatical complexity, and lexical diversity. Parents were briefed on the objectives of the study, use of the recording device, and ethical considerations, after which informed consent was obtained. Alongside recordings, interviews gathered background on each learner's diagnosis, speech milestones, hobbies, social engagement, and common utterances.

Once the data was collected, all spoken language was transcribed for analysis. The researcher examined language productivity by counting the total number of words and T-units, as well as calculating mean length of T-unit, clause density, and frequency of grammatical errors. Below are the formulas used for mean length of T-unit and clause density.

A. Formula for Mean Length of T-unit

$$\bar{x} = \frac{\text{total number of words}}{\text{total number of clauses}}$$

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B. Formula for Clause Density

$$\text{Clause Density} = \frac{\text{total number of clauses}}{\text{total number of T-units}}$$

Grammatical complexity was assessed through clause density and subordination, while lexical diversity was measured through the number of different words and lexical diversity ratios. Below is the formula for lexical diversity.

C. Formula for Lexical Diversity

$$L_d = \frac{\text{Number of lexical items}}{\text{Total number of clauses}} \times 100$$

These analyses were triangulated with interview responses and validated by experts in Linguistics and Psychology to ensure reliability.

The researcher's role was central not only in facilitating data collection but also in safeguarding participants' privacy and dignity. In line with Denzin and Lincoln's (2005) assertion that qualitative research interprets phenomena in natural settings, this study emphasized ethical responsibility and voluntary participation. Parents and guardians were fully informed, and identities were kept confidential. Validation was enhanced using Lincoln and Guba's (1985) principle of dependability, as well as Eiser's (1991) concepts of structural corroboration, consensual validation, and referential adequacy. Two validators—experts in Applied Linguistics and Psychology—reviewed the transcripts and analyses. Their feedback was incorporated into the findings, and results were further substantiated by related studies, strengthening the structural corroboration of the research.

Through this design, the study provided not only linguistic insights into the spoken language of ASD learners but also practical implications for developing a course outline responsive to their unique communicative needs.

IV. RESULTS

The analysis of the spoken language of learners with autism spectrum disorder (ASD) revealed variations in productivity, grammatical complexity, and lexical diversity. Microstructural measures—total number of words (TNW), mean length of T-unit (MLTU), clause density (CD), and lexical diversity (LD)—were applied to capture these dimensions.

Language productivity, as measured by the total number of words, showed considerable variation. Participant 1, a 14-year-old from San Jose City, produced only 32 words across the samples analyzed, most of which were repetitions and incomplete phrases. Participant 2, a 28-year-old from Cabiao, had the lowest productivity, producing only 15 words in total, rarely beyond isolated utterances. Participant 3, a 10-year-old with prior therapy exposure, produced 41 words but was unable to sustain coherent conversations. Participant 4, a six-year-old newly diagnosed and enrolled in occupational therapy, managed 27 words, many of which were mumbled or unintelligible. In contrast, Participants 5, 6, and 7, siblings from Cabiao, demonstrated wider ranges: Participant 5 produced 73 words, often used in short sentences about her daily tasks and aspirations; Participant 6 produced 38 words, largely tied to his singing interests; and Participant 7 produced only 19 words, reflecting his extreme withdrawal from social interaction. These results suggest that access to therapy and consistent social engagement significantly influence language productivity.

Grammatical complexity, reflected in the mean length of T-unit, was uniformly low. Participant 1's utterances averaged 2.1 words per T-unit, indicating reliance on short fragments. Participant 2's T-units were the shortest, averaging 1.7 words, as most of his utterances were single words. Participant 3 reached an average of 2.3 words, while Participant 4 produced T-units averaging 2.0 words. Participant 5 had the highest average, at 3.6 words per T-unit, showing slightly longer but still simple constructions. Participant 6 averaged 2.4 words, and Participant 7 only 1.8 words. Clause density values were similarly low: across all participants, sentences rarely contained more than a single clause, and instances of subordination or coordination were almost nonexistent. This finding underscores Wahlberg and Magliano's (2010) assertion that individuals with ASD often fail to develop complex syntactic structures, focusing instead on isolated details of language.

Lexical diversity was likewise constrained. Participant 1 had a lexical diversity of 42 percent, reflecting heavy reliance on the same limited words. Participant 2's lexical diversity was 39 percent, as his speech revolved around a few repeated terms. Participant 3 reached 45 percent, while Participant 4 scored 41 percent. Participant 5 achieved the highest lexical diversity at 53 percent, incorporating a somewhat broader range of nouns and verbs in her speech. Participant 6 scored 47 percent, particularly when producing lyrics while singing, whereas Participant 7 scored 38 percent, the lowest among the group. These low lexical

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diversity scores confirm Cronin's (2014) argument that ASD learners process language narrowly, repeating familiar vocabulary rather than extending meaning across contexts.

Despite these shared challenges, the participants also demonstrated notable strengths. Participant 5 showed the ability to handle practical tasks and express aspirations, while Participant 6 revealed musical talent that engaged his attention and improved his verbal output. Participant 4, though very young, demonstrated early responsiveness to therapy, illustrating Brentani, Bordini, and de Paula's (2013) claim that early intervention is essential in improving developmental outcomes. The siblings' cases further illustrated Lucero's (2017) finding that environmental factors and parenting style significantly shape the growth of children with autism.

Taken together, the results show that ASD learners in this sample produced limited spoken language characterized by low productivity, short and simple sentence structures, minimal clause density, and restricted lexical diversity. At the same time, individual strengths emerged, suggesting the importance of personalized interventions that build on learners' unique abilities while addressing their language deficits.

P	TNW	MLTU	CD	LD
1	32	2.1	Low (single clause)	42%
2	15	1.7	Low	39%
3	41	2.3	Low	45%
4	27	2.0	Low	41%
5	73	3.6	Low	53%
6	38	2.4	Low	47%
7	19	1.8	Low	38%

There is no single course outline applicable to all learners with autism spectrum disorder (ASD). However, based on the results of the microstructural analysis of spoken language, a specialized course entitled Speech 101 is proposed. This course is scheduled thrice a week (8:00–10:30; 10:30–12:00; 1:00–2:30; and 2:30–5:00) and is designed to develop the spoken language of ASD learners by focusing on the fundamentals of speech. Learners are grouped according to their developmental "age equivalent," as conceptualized by Miller (1981), and instruction is structured around the building blocks of language: phonology, morphology, syntax, and discourse.

The objectives of Speech 101 are threefold: (1) to help learners demonstrate basic speaking skills necessary for communication within their environment, (2) to expand their use of lexical items to construct meaningful sentences, and (3) to encourage appropriate social behaviors in speaking. The course is deliberately developmental and progressive, ensuring that learners advance from sound recognition to sentence construction, while reinforcing social and communicative competence.

For learners at the 18–24-month equivalent, instruction emphasizes phonology through activities designed to enhance sound recognition and articulation. This stage prioritizes motor-speech coordination and introduces phonological patterns that allow learners to combine sounds into simple words. Participants 1, 2, 4, and 7 fall into this developmental range.

At the 25–36-month level, the focus shifts to morphology, specifically the identification and naming of familiar objects and animals. Instruction integrates environmental awareness with early spelling activities, thereby linking linguistic development with social engagement. Participants 3, 6, and 7 are situated within this developmental bracket, though a review phase is recommended before full immersion into morphological tasks to prevent cognitive overload.

For learners at the 37–48-month level, the emphasis is on syntax. Lessons progress from recognizing nouns and pronouns within family and environmental contexts to applying simple verbs in daily communication. The goal is to scaffold basic sentence construction that reflects learners' immediate needs and experiences.

Finally, for learners at 48 months and above level, the course advances to discourse. Instruction centers on recognizing and expressing emotions appropriately, using both visual aids and situational prompts. Simple sentence construction is encouraged through interactive role-play and scenario-based tasks, enabling learners to connect language with lived experiences. Although no current participants reached this developmental range, the proposed design envisions learners gradually progressing toward this level with sustained monitoring and support.

The proposed outline reflects the principle that language instruction for ASD learners must be individualized, progressive, and rooted in both linguistic theory and social practice. Anchoring the design on Miller's (1981) developmental framework ensures that the course adapts to learners' communicative readiness while addressing their diverse needs.

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Developmental Age Equivalent (Miller, 1981)	Focus Area	Objectives	Sample Activities	Expected Outcomes
18–24 months	Phonology	- Recognize and produce basic phonetic sounds - Develop articulation and early phonological patterns	Tracing phonetic symbols while producing sounds; mixing and matching phonemes to form simple words	Learners can articulate distinct sounds and combine them into simple words (e.g., “ma,” “pa”)
25–36 months	Morphology	- Identify familiar objects and animals - Spell and form words from identified items	Using plush toys/household objects for naming tasks; arranging letter blocks to spell words	Learners can name objects independently and begin spelling simple words (e.g., “cat,” “ball”)
37–48 months	Syntax	- Differentiate nouns, pronouns, and simple verbs - Construct basic commands and requests	Family tree diagram for nouns/pronouns; flashcards and videos for simple verbs and actionbased commands	Learners can create short sentences with correct subject–verb use (e.g., “I eat,” “He runs”)
48 months and above	Discourse	- Recognize and express emotions appropriately - Construct simple sentences in meaningful contexts	Matching emoji cutouts with scenarios; role-play and guessing games to build short sentences	Learners can express emotions through words and form short meaningful dialogues in context

V. CONCLUSIONS

This study examined the spoken language of seven learners with autism spectrum disorder (ASD) in Nueva Ecija using the Microstructural approach, focusing on language productivity, grammatical complexity, and lexical diversity. Language productivity, defined as the ability to use language creatively (Nordquist, 2020; Yule, 2006), was measured through the total number of words and different T-units uttered by each participant (Crystal, 2008).

Participant 1 demonstrated productive language with sentences of one to six words, following a consistent *verb + object* pattern. Participant 2 exhibited semi-productive language, constrained by environmental exposure, producing one- to two-word sentences. Participant 3 produced only two words and occasional fillers, reflecting semi-productive language limited by social interaction. Participant 4 produced only sounds, indicative of non-productive language. Participants 5 and 6, who received speech and occupational therapies, demonstrated productive language, whereas Participant 7 remained non-verbal due to lack of therapeutic intervention (Crystal, 2008; Trask, 2000).

T-unit analysis showed Participant 1 produced the most diverse T-units (26), while Participants 4 and 7 had none, reflecting delayed language development. Mean length of T-units and clause density revealed Participants 5 and 6 had age-equivalent language skills of 2–3 years, while Participants 1, 2, and 3 were equivalent to 18 months–2.5 years (Miller, 1981; Gavin, 2022). Lexical diversity was highest in Participant 1, with 91 different words, whereas Participants 4 and 7 produced none (Parish-Morris, 2018; Malvern, 2004). Grammatical errors were minimal among participants with limited utterances but were more frequent in Participants 5 and 1, consistent with Hughes’ (2012) assertion that learners with ASD often follow the linguistic patterns of their environment.

Based on these findings, a proposed course, Speech 101, was developed to enhance spoken language in ASD learners. Instruction is structured according to age-equivalent levels (Miller, 1981) and the building blocks of language: phonology, morphology, syntax, and discourse. Learners with an age equivalent of less than 18–24 months, including Participants 1, 2, 4, and 7, focus on phonology by recognizing and articulating phonetic letters, tracing their outlines, and practicing basic phonological patterns to strengthen both speech and motor skills. Those with an age equivalent of 25–36 months, including Participants 3, 6, and 7, focus on morphology through identification of objects and animals, as well as spelling activities using letter blocks, reinforced by play-based scenarios. Learners with an age equivalent of 37–48 months engage in syntax-focused activities, such as differentiating nouns and

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pronouns using family tree diagrams, and practicing simple verbs through action-based games. Finally, discourse-oriented lessons are designed for learners with an age equivalent of 48 months and above, focusing on recognizing emotions and constructing simple sentences through role-play and scenario-based activities. Sessions are planned thrice weekly to monitor progress and ensure gradual skill acquisition. While no participants currently meet the highest level, individualized guidance may enable advancement to discourse-focused activities.

The proposed Speech 101 course provides a structured, evidence-based framework to support spoken language development in learners with ASD. Anchoring instruction on age-equivalent milestones and microstructural language analysis allows for individualized, developmentally appropriate learning while addressing diverse communicative abilities. Practical implications emphasize the importance of collaboration among teachers, therapists, and caregivers, as well as adaptive activities tailored to learner responsiveness. Research implications highlight the value of incremental, multimodal, and environment-supported interventions to enhance functional communication in ASD learners (Ueda-Tao, 2011; Sonnen, 2007; Thane, 2016; Anderson, 2008).

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