



Expressive morphological deficiencies in children with autism: regular past inflections and pluralization morphemes

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Abstract

The inability of children with autism spectrum disorder to communicate effectively and with confidence as well as the documentation of the level of deficiencies in their speech motivated the thrust of this study. A survey of 20 children aged 5 to 12 was conducted at the Our Lady of Guadalupe Autistic Centre in Rivers State, Nigeria. It examined the severity of the clients' morphological disorder. A judgment sampling technique was used to identify autistic children with intermediate autism who still had speech and could be remediated. Data were gathered employing the verified Word Structure (WS) evaluation, with sentence completion tasks, in addition to a validity test re-test of mean length of utterance (MLU), which professionals discovered to have a significant degree of internal coherence ($r = .94$). The respondents were asked to read a paragraph of 100 utterances, and the readings were then recorded and transcribed for analysis using Systematic Analysis of Language Transcript (SALT) software. The analysis was made easier with the use of the word-based theory. The major findings showed that the production of the past tense and plural morphemes of the clients both in the mean length of utterance in word (MLU_w) and mean length of utterance in morpheme (MLU_m) were less than 5.0. The findings can be used to arrange for a suitable assessment design and therapy for the clients.

Keywords: Autism, disorder, morphology, inflections, pluralization

1. Introduction

One of the outstanding achievements of children growing up is the development of language abilities. Language acquisition opens up new possibilities in other growth areas, such as mental, social, and psychological development. (Schlichting et al. 1995; Maljaars et al, 2012). Based on this, Okon (2023) views language as the result of a cognitive process in which the communication stock of lexical items is minimally arranged. Any shift from the normal whether in word or sentence formation is a disorder. A language disorder is noted when a child deviates during the developmental stages of

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language acquisition. An example is autism, a spectrum of different speech disorders in which the affected person is confronted with difficulties in verbal/non-verbal communication and social interaction as well as restricted and repetitive behaviour. This language learning aberration could be expressive, receptive, or a combination. Autistic children's language acquisition disabilities or delays may occur at several linguistic levels. According to Bartak et al. (1977), as cited in Lindgren, et al (2000) despite having identical deficiencies in expressive language and language output, autistic children scored significantly worse on measures of language comprehension compared to children with specific language impairment (SLI). Studies also show that 63% of children with ASD approximately have language disorders (Levy, et al. 2010; Georgiou & Spanoudis 2021). It is observed that many persons with ASD have deficiencies in other levels of language structure like phonology, grammar, and semantics. They exhibit language disabilities that coexist with social communication problems which is a core symptom of this neurodevelopmental disorder (Baird, et al. 2006; Happe & Frith 2020; Berenguer, et al. 2024). Kjelgaard and Tager-Flusberg (2001) found that when a large group of children with autism was evaluated on diverse standardised language measures, including the clinical test of language basics and a non-word repetition test, the children with autism performed one standard deviation or more below the mean in total language ability as measured by CELF-III. Studies also show that receptive language development is similarly slowed in autistic children. Gernsbacher et al. (2015) concluded in their research that the acquisition of language in children with autism is often retarded though not abnormal. The study also posited that a child's development of language being postponed is not specific to autism and that language acquisition in children is astonishingly varied.

It is crucial to highlight that while some research has been conducted on the morphological difficulties of children with autism all around the world, little has been done in Nigeria. Children with morphological deficiencies, according to Etim (2021), have difficulties learning and applying the rules that regulate word construction. At this level, the affected children may not employ plural forms or verb tenses correctly. Throughout the children's lower school period, morphology and syntax show up as the specific areas that they struggle with, and as they mature and develop the necessary skills to take part in conversations, story-telling abilities also show as a weakness (Bavin, 2009, as cited in Etim 2019). According to the findings of a study conducted by Ozgen, and colleagues (2011), children with autism have a much greater prevalence of morphological irregularities, including both mild and large disabilities, as well as common variants. The present study focuses on the morphological flaws of autistic children, specifically in inflections and pluralization. It employs the Reynell Language Development Scale (RLDS) (Reynell & Gruber, 1990) as an established assessment. Such a study is required for the early remediation of the deficiencies in the expressions of children with autism.



1.1 Autism Spectrum Disorders

According to the American Psychiatric Association (as cited in Steiner, 2011), people with autism spectrum disorders (ASD) exhibit unusual, restricted, and repetitive conduct and interests, and have difficulty with typical and widespread difficulties in reciprocal social communication and interactions. The inability to develop language, according to Mody and Belliveau (2013), is one of the earliest indications of autism. This raises a severe concern for people with ASD because language impairments are rarely consistent, making diagnosis and treatment difficult.

Zaky (2017) claims that children with ASD should be screened for the disorder between the ages of 30 and 36 months; nevertheless, the full manifestation of the disorder may not occur until the child's abilities have been far outpaced by social expectations. A study conducted by Maenner, et al. (2023) observes that the frequencies of the spectrum have gone up dramatically in 2020. They observed that one in thirty-six children is estimated to have been diagnosed with the spectrum, and they all struggle with social communication. According to Baron-Cohen, Leslie, and Frith (1985), impairment in verbal and nonverbal communication is the primary symptom that can be reliably used to diagnose an autistic child.

1.2 Morphological disorders

Developmental language disorders can be researched in linguistics through the study of morphology. According to Kornilov, Rakhlin, and Grigorenko (2012), inflectional and derivational morphology are typically studied separately, and disorders at all levels of morphology are found as language impairment, emphasizing inflectional morphology. Panke (2009) also notes that in languages like Italian that may not allow stems or roots as words, morphological deficiencies can manifest as mistakes of omission (a defaulted form substituting the correct one) or errors of substitution (a defaulted form). Dromi, et al. (1999) observe that the inflectional model's shape also affects the replacement error rate. In other words, the more forms an inflectional model has, the greater the rate of substitution errors. Grammatical word structure is a particular area of difficulty for English-speaking children who have language disorders, according to Leonard (2014). Another finding is that children with language impairment show a significant delay in picking up grammatical morphemes, which is regarded as a defining feature of ASD. The third-person singular -s is observed to be impacted in children who speak English, but the plural -s is not, which is more evidence that classes of inflectional categories can be selectively affected (Leonard, 2014).

1.3 Theoretical framework

The word-based model is the theory adopted in the analysis of data for this study. According to Etim (2019), the word-based approach was first put forth by Aronoff (1976) It claims that all normal word-production processes are word-based and that a regular rule is applied to a single existing word to create a new term. Both the brand-new word and the current word belong to significant lexical categories. According to Blevins (2006), word forms are viewed as the fundamental building blocks of a system in the word-based

approach to morphological description, which prioritizes abstractions above entire forms for recurring portions. Haspelmath and Sims (2010) also notes that the word is given primary importance in the word-based model and that the relationship between complex words is expressed through the development of word schemas that represent the characteristics shared by morphologically related words. Blevins (2006) adds that morphological patterns in grammar can be examined from either a "morph-based" or "word-based" perspective, which is, respectively, creative and abstractive in a morphotactic context. The post-Bloomfieldian patterns, with which morphological Analyses are essentially a method of sorting and categorising, are firmly related to the constructive method. According to Haspelmath and Sims (2010), the "word-based" approach indicates a perspective on morphology that is congruent with the statement that "Morphology is the research on systematic co-variation in the form and meaning of words." The following examples show how the word schema might explain the analogies between the English words *bags*, *keys*, *gods*, *ribs*, *bones*, and *gems* (among many others):

Words: gods, ribs, bones, diamonds, bags, keys, and 1a.

(1) Word definitions in lexicons

[/bægz/N] 'bags' [/k^hijz/N] 'keys' [/gadz/N] 'gods' [/ribz/N] 'ribs'
 Word-schema: plurality of s' [Xz/N]

Sims & Haspelmath (2010)

According to Haspelmath and Sims (2010), a word schema in the example above is similar to a lexical entry in that it comprises data about vocalisation, syntactic characteristics, and meaning. However, the word schema may also include other elements, like N. As a result, it just expresses the similarities among related words and abstracts away their differences. The schema in (1c) conveys that every word in (1a,b) ends in /z/, that each word denotes a variety of objects, and that each word is a noun (the subscript N is present after the phonological representation). The variable /X/ is used in place of the phonological string that precedes the /z/ because it is highly different. Importantly, a word schema does not represent single morphemes in the sense of morpheme-based patterns, but rather whole words. The lexical entries in (1b) serve as the foundation for the word schema in (1c), which is a generalization based on word forms rather than morphemes.

Blevins (2006) calls realization-based models "word-based" due to their ability to associate qualities with words. The morphotactic status of these units allows for further classification of models. A morphotactically 'word-based' model treats roots, stems, and exponents as surrogates for a larger set of entire forms rather than as the system's primary building blocks.

2. Methodology

2.1. Participants

Ethical approval was requested and obtained from the Ethical Committee of the University of Calabar to conduct this research. Parental



informed consent was also obtained. 20 children who were already diagnosed with ASD at Our Lady of Guadalupe Autistic Centre (ten males and ten females) were the participants in this study. Communicative Development Inventories (CDI) were used to get more information about the children's language development. Using a judgmental sampling technique and test results supplied by the Centre, the researcher could choose the children with moderate autism to participate in the study.

2.2. *Inclusion/exclusion criteria*

The inclusion included autistic children with moderate speech disorders for easy remediation while exclusion criteria included the autistic children with severe disorder.

2.3. *Data collection and processing*

Kornilov et al. (2012) state that, Word Structure (WS) is an independently administered evaluation for children focused on testing expressive morphological skills through pictures and sentence completion exercises. As a result, a participant was given a pair of pictures to complete based on pluralization morphemes and regular past inflectional morphemes. The Word Structure test consisted of ten picture-naming activities for data collection. The picture-naming assignment was intended to get the client's attention. Also, Mean Length of Utterance (MLU) evaluates the children's language production. Bigelow (2012) suggests that MLU can be applied in language sample analysis to aid in the identification of language impairment in populations where standard testing is problematic. Each client was interviewed separately in the language therapy lab of the centre. The time spent with each child varied according to the child's disposition. However, the order of the interviews was consistent for all the participants. Before administering the passage, each client was given a picture-naming task to capture their attention. Pictures and photographs connected to the passage were displayed on the screen and each child was required to identify. The participants were then given a text 'Frog Where Are You?' which they were requested to retell in narrative form. They listened to the story which was read by the researcher more than once, then they were required to read it by themselves and retell the story in their own words in English. The text contained a hundred utterances including phrases and sentences with regular past tenses and plural morphemes. Those who were not able to read were asked to repeat after the researcher. A recorder and a headset were used to record their utterances and responses in the targeted morphemes. After the collection of data and recording, a qualitative and quantitative analysis with the Systematic Analysis of Linguistic Transcript (SALT) programme was employed. The data were further analysed using bar charts and a spider plot to summarise the findings of the study.

2.4. *Data analysis*

After the collection of data and recording, a qualitative and quantitative analysis with the Systematic Analysis of Linguistic Transcript (SALT) programme was employed. The data were further analysed using bar charts and a spider plot to summarise the findings of the study.

3. Findings

The findings of this study are presented according to individual's performances as follows:

3.1. Participant 1 (11;07 F)

She made 88 statements, totaling 354 words. These statements were 74, exclamations were 7, and inquiries were 7. She spoke at an average of 4.43 words per utterance and 4.51 morphemes per utterance (MLUw/MLUm). She spoke in 2-, 3-, and 4-word sentences most commonly.

57.95% of her words were incorrect. Despite producing the plural bound morpheme only once, the past tense bound morpheme six times, a contracted verb form twice, and the other bound morphemes seven times, she left out the plural bound morpheme ten times, the past tense bound morpheme 28 times, the other bound morphemes seven times, and the contracted verb form four times. The terms BECOME*[EW], MEET*[EW], RECONCIL/*D, once, COME*[EW], GO*[EW], IS*[EW], and WRITE*[EW] were all unnecessary in her sample. She made the following word-level error in her sample: IS*[EW:WAS]. She made the following utterance-level mistakes in her sample: RUN*[EU] and BECOME*[EU].

3.2. Participant 2 (10;09 F)

She made 84 statements, totaling 341 words. The statements were 71, exclamations were 5, and questions were 7. She spoke at an average of 4.42 words per utterance (MLUw) and 4.50 morphemes per utterance (MLUm). She spoke most commonly in 2-, 3-, and 5-word utterances.

Errors were present in 64.29% of her words. Although she produced the plural bound morpheme twice, the past tense bound morpheme three times, a contracted verb form once, and the other bound morphemes seven times, she left out the plural bound morpheme, the past tense bound morpheme 28 times, the other bound morphemes, and the plural bound morphemes four and seven times, respectively. The following overgeneralization mistakes were present in her sample: JUMP/*ED [EO:OMITTED], REPRESENT/*ED [EO:OMITTED], and DANCE/D* [EO:OMITTED]. She used the following unnecessary words in her sample: AM, IS, MEET, and SAY. She made the following word-level errors in her sample: IS*[EW:ARE], CAN*[EW:COULD], DO*[EW:DID], DYE[EW:DIED], HAVE*[EW:HAD], IS*[EW:WAS], REPORT/*ED[EW:ED OMITTED], and THERE*[EW:THEY]. She made the following utterance-level mistakes in her sample: TIME[EU] and DIE/*D[EU]. She also had the following two utterance-level mistakes in her sample: C AFter* [EU] family have* [EW:had] dinner together. C Have not read/ing* [EU] in the Bible?

3.3. Participant 3 (06;08 F)

She made 83 statements, totaling 337 words. There were 73 statements, 5 exclamations, and 5 questions in total. Her mean length of utterance in words (MLUw) and morphemes (MLUm) were 4.42 and 4.52 respectively. She spoke most commonly in 2-, 3-, and 4-word sentences.

The mistakes were evident in 74.70% of her words. Although she generated the plural bound morpheme once, the past tense bound



morpheme four times, and a contracted verb form once, she left out the plural bound morpheme ten times, the past tense bound morpheme 27 times, the contracted verb form twice, and the other bound morphemes seven times. In this instance, she did not use any other morphemes. She used the following unnecessary words in her sample: AM*[EW], GO*[EW], KNOW*[EW], MEET*[EW], PLAY/ING [EW], SAY*[EW], six times, and WRITE*[EW]. The following word-level errors were found in her sample: DYE*[EW:DIED], MEET* [EW:MET], and SEE*[EW:SAW]. Her sample utterances include the following: COM/*ING[EU] once, EAT[EU] once, GO[EU] three times, EAT[EU] once, and IS[EU] once.

3.4. *Participant 4 (07;08 F)*

She used a total of 354 words in 91 utterances. 75 assertions, 11 exclamations, and 5 inquiries made up these utterances. Her mean length of utterance in words (MLUw) and morphemes (MLUm) were respectively 4.21 and 4.31. She spoke most commonly in 2-, 3-, and 4-word utterances.

69.23% of what she said were incorrect. Although she produced the plural bound morpheme once, the past tense bound morpheme four times, a contracted verb form twice, and the other bound morphemes once, she omitted the plural bound morpheme eleven times, the past tense bound morpheme twenty-seven times, a verb form five times, and the other bound morphemes seven times. She used the words AM*[EW] once, GO*[EW] twice, KNOW*[EW] once, MEET*[EW] once, PLAY/ING[EW] once, SAY*[EW] five times, and WRITE*[EW] once in her sample. The following word-level errors were found in her sample: DYE*[EW:DIED], MEET*[EW:MET], and SEE*[EW:SAW]. She made the following utterance-level mistakes in her sample: AM*[EU], IS*[EU], RUN[EU], WAS [EU], and RUN*[EU].

3.5. *Participant 5 (11;07 F)*

She used a total of 354 words in 91 utterances. There were 75 statements, 9 exclamations, and 7 questions in total. Her mean length of utterance in words (MLUw) and morphemes (MLUm) were respectively 4.32 and 4.41. She spoke most commonly in 2-, 3-, and 4-word sentences.

Mistakes were present in 61.54% of her words. Although she produced the plural bound morpheme once, the past tense bound morpheme four times, a contracted verb form twice, and the other bound morphemes once, she omitted the plural bound morpheme ten times, the past tense bound morpheme twenty-eight times, a verb form four times, and the other bound morphemes eight times. The following words were included in her sample: BECOME*[EW], COME*[EW], GO*[EW], IS*[EW], and WRITE*[EW], STUD/*IES[EW], and RECONCIL*/D[EW]. She made the following word-level errors in her sample: IS*[EW:WAS]. The following utterance-level mistakes were found in her sample: BECOME*[EU] and RUN*[EU], COMPETION*[EU], DANC/*D[EU], THE*[EU], THEE*[EU], and SEE*[EU].

3.6. *Participant 6 (11;07 M)*

He made 84 statements, totaling 341 words. There were 72 statements, 7 exclamations, and 5 questions in total. He spoke for an average of 4.38

words per utterance (MLUw) and 4.50 morphemes per utterance (MLUm). He spoke most commonly in 2-, 3-, and 4-word sentences.

70.24% of his words were incorrect. Although he produced the plural bound morpheme twice, the past tense bound morpheme four times, a contracted verb form twice, and the other bound morphemes once, he omitted the plural bound morphemes nine times, the past tense bound morpheme twenty-six times, and the other bound morphemes seven times. He used the following unnecessary words in his sample: One time each for AM*[EW], GO*[EW] twice, KNOW*[EW], MEET*[EW], PLAY/ING [EW], SAY*[EW], six times, and WRITE*[EW]. The following word-level errors were found in his sample: DYE* [EW:DIED], MEET* [EW:MET], and SEE* [EW:SAW]. The following errors at the utterance level were present in his sample: EAT* [EU] once, GO* [EU] twice, COM/*ING [EU] once, and IS* [EU] once.

3.7. *Participant 7 (06;09 M)*

He made 86 statements, totaling 342 words. 75 assertions, 6 exclamations, and 5 inquiries made up these utterances. His mean length of utterance in words (MLUw) and morphemes (MLUm) were respectively 4.30 and 4.36. He spoke most commonly in 2-, 3-, and 4-word sentences.

74.42% of his words were incorrect. He produced the plural bound morpheme once, the past tense bound morpheme twice, a contracted verb form twice, and the other bound morphemes once, but he left out the past tense bound morpheme thirteen times, the other bound morphemes eight times, the past tense bound morpheme twenty-eight times, a contracted verb form four times, and the plural bound morphemes eight times. He used the following unnecessary words in his sample: One time in AM, twice in GO, once in KNOW, once in MEET, once in PLAY/ING, six times in SAY, and once in WRITE. The following word-level errors were found in his sample: DYE*[EW:DIED], MEET*[EW:MET], and SEE*[EW:SAW]. The following errors at the utterance level were present in his sample: One time COM/*ING[EU], three times GO[EU], and one time IS[EU].

3.8. *Participant 8 (08;01 M)*

He made 89 statements, totaling 355 words. There were 77 statements, 7 exclamations, and 5 questions in total. His mean length of utterance in words (MLUw) and morphemes (MLUm) were respectively 4.31 and 4.39. He spoke most commonly in 2-, 3-, and 4-word sentences.

77.53% of his words were incorrect. Although he produced the plural bound morpheme once, the past tense bound morpheme four times, a contracted verb form twice, and the other bound morphemes once, he omitted the plural bound morphemes thirteen times, the past tense bound morpheme thirty-nine times, and the other bound morphemes seven times. He used the following unnecessary words in his sample: One time each for AM*[EW], BECOME[EW], GO[EW], KNOW[EW], MEET[EW], PLAY/ING[EW], RAN[EW], SIX[EW], and WRITE[EW]. He made the following word-level errors in his sample: COME [EW: CAME] twice, DIE once (DYE*[EW: DIED]), MEET once (MET), and SEE once (SAW). The following errors at the utterance level



were present in his sample: One time COM/*ING[EU], three times GO[EU], and one time IS[EU].

3.9. *Participant 9 (09;06 M)*

He made 85 statements, totaling 344 words. There were 73 statements, 7 exclamations, and 5 questions in total. His mean length of utterance in words (MLUw) and morphemes (MLUm) were respectively 4.39 and 4.47. He spoke most commonly in 2-, 3-, and 4-word sentences.

76.47% of his words were incorrect. Although he produced the plural bound morpheme once, the past tense bound morpheme four times, a contracted verb form six times, and the other bound morphemes seven times, he omitted the plural bound morpheme eleven times, the past tense bound morpheme twenty-six times, the other bound morphemes seven times. He used the following unnecessary words in his sample: One time each for AM*[EW], BECOME*[EW], GO*[EW], KNOW*[EW], MEET*[EW], PLAY/ING*[EW], RAN[EW], SAY*[EW], six times, and WRITE*[EW]. He made the following word-level errors in his sample: Two times, one each for COME [EW:CAME], DYE*[EW:DIED], MEET*[EW:MET], and SEE*[EW:SAW]. The following errors at the utterance level were present in his sample: COM/*ING [EU], GO [EU], GO*[EU], and IS [EU] all once.

3.10. *Participant 10 (06;09 M)*

He made 85 statements, totaling 344 words. There were 73 statements, 7 exclamations, and 5 questions in total. His mean length of utterance in words (MLUw) and morphemes (MLUm) were respectively 4.41 and 4.48. He spoke most commonly in 2-, 3-, and 4-word sentences.

78.82% of his words were incorrect. Although he produced the plural bound morpheme once, the past tense bound morpheme three times, a contracted verb form six times, and the other bound morphemes seven times, he omitted the plural bound morpheme eleven times, the past tense bound morpheme twenty-seven times, the other bound morphemes seven times, and the past tense bound morpheme seven times. He used the following unnecessary words in his sample: One time each of BECOME*[EW], GO*[EW], KNOW*[EW], ME*[EW], RUN*[EW], SAY*[EW], and WRITE*[EW]. He made the following word-level errors in his sample: COME [EW:CAME] twice, DYE* [EW:DIED] once, HIM [EW:HE], MEET* [EW:MET], SEE* [EW:SAW], and THEY [EW:THEIR] all once. The following errors at the utterance level were present in his sample: AGAIN once [EU], once [COM/*ING[EU]], once [EAT*[EU]], once [GO[EU]], once [GO* [EU]], three times [IS*[EU]], once [GO*D[EU]], once [INSIDE*[EU]], and twice [IS*[EU]].

3.11. *Participant 11 (10;04 F)*

She made 86 statements, totaling 347 words. There were 74 statements, 7 exclamations, and 5 questions in total. She spoke at an average of 4.37 words per utterance (MLUw) and 4.40 morphemes per utterance (MLUm). She spoke most commonly in 2-, 3-, and 4-word sentences.

Inaccuracies were present in 79.07% of her words. Although she generated the plural bound morpheme once, she did not utilize any other

bound morphemes in this sample. Instead, she omitted the past tense bound morpheme 29 times, the contracted verb form 6 times, the other bound morphemes 8 times, the plural bound morpheme 13 times, and the past tense bound morpheme. She used the following extraneous terms in her sample: AM once, BECOME once, GO twice, KNOW once, MEET once, PLAY/ING once, RAN once, SAY five times, and WRITE twice. She made the following word-level errors in her sample: Two times, one each for COME[EW:CAME], DYE*/D[EW:DIED], MEET*[EW:MET], and SEE*[EW:SAW]. She made the following utterance-level mistakes in her sample: COM/*ING[EU], EAT[EU], GO[EU] twice, GO[EU], and IS[EU], each of which occurred once.

3.12. Participant 12 (10;02 F)

She used a total of 344 words in 85 utterances. There were 73 statements, 7 exclamations, and 5 questions in total. She spoke at an average of 4.39 words per utterance (MLUw) and 4.47 morphemes per utterance (MLUm). She spoke most commonly in 2-, 3-, and 4-word sentences.

Mistakes were present in 76.47% of her words. Although she produced the plural bound morpheme once, the past tense bound morpheme four times, a contracted verb form once, and the other bound morphemes once, she did not use any other bound morphemes in this sample. She omitted the plural bound morpheme eleven times, the past tense bound morpheme twenty-six times, a verb form six times, and the other bound morphemes seven times. She used the following extraneous terms in her sample: One time each for AM*[EW], BECOME*[EW], GO*[EW], KNOW*[EW], MEET*[EW], PLAY/ING*[EW], RAN*[EW], SAY*[EW], and WRITE*[EW]. The following word-level errors were found in her sample: COME (EW:CAME) twice, DYE*/D (EW:DIED) once, MEET* (EW:MET) once, and SEE* (EW:SAW) twice. She made the following utterance-level mistakes in her sample: COME/*ing once, EAT once, GO once, and IS once in the EU.

3.13. Participant 13 (07;06 F)

She made 89 statements, totaling 353 words. There were 79 statements, 5 exclamations, and 5 questions in total. She spoke at an average of 4.35 words per utterance (MLUw) and 4.37 morphemes per utterance (MLUm). She spoke most commonly in 2-, 3-, and 4-word sentences.

78.65% of her words were incorrect. Although she created the plural bound morpheme once, she did not utilize any other bound morphemes in this sample. She left out the plural bound morpheme 15 times, the past tense bound morpheme 33 times, a contracted verb form 4 times, and the other bound morphemes 8 times. She used the following extraneous terms in her sample: AM*[EW], GO*[EW], KNOW*[EW], MEET*[EW], PLAY/ING [EW], SAY*[EW], five, SAY, and WRITE*[EW] once each. She made the following word-level errors in her sample: GO [EW:GOING] once, COMPETE* [EW:COMPETITION] twice, DYE*/D[EW:DIED] once, MEET* [EW:MET] once, and SAW* [EW:SAW] twice. She made the following utterance-level mistakes



in her sample: COMING/*ING [EU] once, EATING [EU] once, TRAVELING [EU] three times, IN [EU], RUN [EU], TRAVELING [EU], and IS [EU] once.

3.14. *Participant 14 (06;04 F)*

She made 92 statements, totaling 354 words. There were 79 statements, 8 exclamations, and 5 questions in total. She spoke at an average of 4.23 words per utterance (MLUw) and 4.27 morphemes per utterance (MLUm). She spoke most commonly in 2-, 3-, and 4-word sentences.

Mistakes were present in 76.09% of her words. Although she produced the plural bound morpheme twice, the past tense bound morpheme twice, a contracted verb form once, and the other bound morphemes once, she did not use any other bound morphemes in this sample. She omitted the plural bound morphemes 11 times, the past tense bound morpheme 30 times, a contracted verb form 5 times, and the other bound morphemes 8 times. The following overgeneralization error was present in her sample: MAKE*D[EO:MADE]. She used the following extraneous terms in her sample: One time each for AM*[EW], GO*[EW], KNOW*[EW], MEET*[EW], PLAY/ING [EW], SAY*[EW] and WRITE*[EW]. The following word-level errors were found in her sample: DYE*/[EW:DIED], MEET*/[EW:MET], ONE*/[EW:ONCE], and SEE*/[EW:SAW]. She made the following utterance - level mistakes in her sample: EAT*[EU] once, COM/*ING[EU] twice, IS*[EU] twice; LOOKED[EU] once; PULLED/ING: READ/ING; and RAN*[EU] once.

3.15. *Participant 15 (11;03 F)*

She used a total of 359 words in 91 utterances. There were 76 statements, 9 exclamations, and 6 questions in total. She spoke at an average of 4.27 words per utterance (MLUw) and 4.29 morphemes per utterance (MLUm). She spoke most commonly in 2-, 3-, and 4-word sentences.

Mistakes were present in 74.73% of her words. Although she created the plural bound morpheme once, she did not utilize any other bound morphemes in this sample. She omitted the past tense bound morpheme 33 times, the contracted verb form five times, the other bound morphemes, and the plural bound morpheme eleven times. She used the following extraneous terms in her sample: One time each for AM*[EW], GO*[EW], KNOW*[EW], MEET*[EW], PLAY/ING [EW], SAY*[EW], SHOUT/*ED [EW] twice, and WRITE*[EW]. She made the following word-level errors in her sample: Once each for DYE*/D[EW:DIED], MEET*[EW:MET], and SEE*[EW:SAW]. She made the following utterance-level mistakes in her sample: one time COM/*ING [EU], one time COM/*S[EU], one time EAT*[EU], three times GO*[EU], one time GO[EU], one time IS*[EU], and one time MATTER[EU].

3.16. *Participant 16 (11;01 M)*

He made 87 utterances, totalling 343 words. There were 77 statements, 5 exclamations, and 5 questions in total. His mean length of utterance in words (MLUw) and morphemes (MLUm) were 4.32 and 4.33, respectively. He spoke most commonly in 2-, 3-, and 4-word sentences.

83.91% of his words were incorrect. Although he created the plural bound morpheme once, he did not utilize any other bound morphemes in this sample. He left out the plural bound morpheme 13 times, the past tense bound morpheme 32 times, a contracted verb form 5 times, and the other bound morphemes 8 times. He used the following extraneous terms in his sample: once each for AM, ASK/ED, COMPETITION, GO, KNOW, MEET, PLAY/ING, SAY, SAY/ING, and WRITE. He made the following word-level errors in his sample: one time each for DYE*/D[EW:DIED], MEET*[EW:MET], ONE*[EW:ONCE], and SEE*[EW:SAW]. The following errors at the utterance level were present in his sample: COME* [EU] once, EAT* [EU] once, GO* [EU] four times, IS* [EU] once, and IN [EU] once.

3.17. *Participant 17 (11;06 M)*

He made 84 statements, totaling 340 words. There were 74 statements, 5 exclamations, and 5 questions in total. His mean length of utterance in words (MLUw) and morphemes (MLUm) were 4.32 and 4.33, respectively. He spoke most commonly in 2-, 3-, and 4-word sentences.

78.57% of his words were incorrect. Although he created the plural bound morpheme twice, he did not utilize any other bound morphemes in this sample. He left out the plural bound morpheme 12 times, the past tense bound morpheme 29 times, a contracted verb form 4 times, and the other bound morphemes 8 times. He used the following extraneous terms in his sample: EATING once, MOVING twice, KNOWING once, MEETING once, PLAYING once, SAYING four times, and WRITING once. He made the following word-level errors in his sample: Once each for DYE*/D[EW:DIED], MEET*[EW:MET], and SEE*[EW:SAW]. The following errors at the utterance level were present in his sample: EAT*[EU] once, GO* [EU] three times, COM/*ING [EU] once, and IS*[EU] once.

3.18. *Participant 18 (09;11 M)*

He made 89 statements, totaling 355 words. There were 74 statements, 8 exclamations, and 7 questions in total. His mean length of utterance in words (MLUw) and morphemes (MLUm) were 4.33 and 4.34, respectively. He spoke most commonly in 2-, 3-, and 4-word sentences.

75.28% of his words were incorrect. Although he created the plural bound morpheme once, he did not utilize any other bound morphemes in this sample. He left out the plural bound morpheme 12 times, the past tense bound morpheme 31 times, a contracted verb form 5 times, and the other bound morphemes 8 times. He used the following extraneous terms in his sample: EAT once, GO twice, JOIN once, KNOW once, MEET once, PLAY once, SAY six times, and WRITE once. The following word-level errors were found in his sample: DYE*/D[EW: DIED], MEET*[EW: MET], and SEE*[EW: SAW]. The following errors at the utterance level were present in his sample: EAT*[EU] once, GO* [EU] three times, COM/*ING [EU] once, and IS*[EU] once.

3.19. *Participant 19 (07;02 M)*

He made 84 statements, totaling 340 words. There were 74 statements, 5 exclamations, and 5 questions in total. His mean length of utterance in



words (MLUw) and morphemes (MLUm) were 4.32 and 4.33, respectively. He spoke most commonly in 2-, 3-, and 4-word sentences.

75.00% of his words were incorrect. Although he produced the plural bound morpheme once, the past tense bound morpheme four times, a contracted verb form once, and the other bound morphemes seven times, he left out the plural bound morpheme, the past tense bound morpheme eleven times, the other bound morphemes seven times, and the bound morphemes in the other tenses 27 times. He used the following extraneous terms in his sample: one each of AM*[EW], GO*[EW], KNOW*[EW], MEET*[EW], PLAY/ING [EW], SAY*[EW], and WRITE*[EW]. He made the following word-level errors in his sample: DYE*/D once [EW:DIED], twice [EW:SAW] and once [EW:MET]. The following errors at the utterance level were present in his sample: COME*[EU] once, COME*[EU] once, EAT*[EU] once, GO*[EU] three times, IS*[EU] once, and IN [EU] are all one-time verbs.

3.20. *Participant 20 (05;04 M)*

He made 84 statements, totaling 339 words. There were 74 statements, 5 exclamations, and 5 questions in total. His mean length of utterance in words (MLUw) and morphemes (MLUm) were 4.42 and 4.44, respectively. He spoke in 2-, 3-, and 4-word sentences most commonly.

78.57% of his words were incorrect. Although he created the plural bound morpheme once, he did not utilize any other bound morphemes in this sample. He left out the plural bound morpheme 13 times, the past tense bound morpheme 31 times, a contracted verb form 4 times, and the other bound morphemes 8 times. The following extraneous words were included in his sample: *COMPETITION [EW] once, AM*[EW] once, COME*[EW] twice, COMPETITION GO*[EW] once, KNOW*[EW] once, MEET*[EW] once, PLAY/ING [EW] once, and WRITE*[EW] once. He made the following word-level errors in his sample: one time each for MEET*[EW: MET], ONE*[EW:ONCE], and SEE*[EW:SAW]. The following errors at the utterance level were present in his sample: EAT*[EU] once, GO*[EU] four times, IS*[EU] once and COM/*ING [EU] once.

The results were further analysed using bar charts shown in Figures 1 to 4.

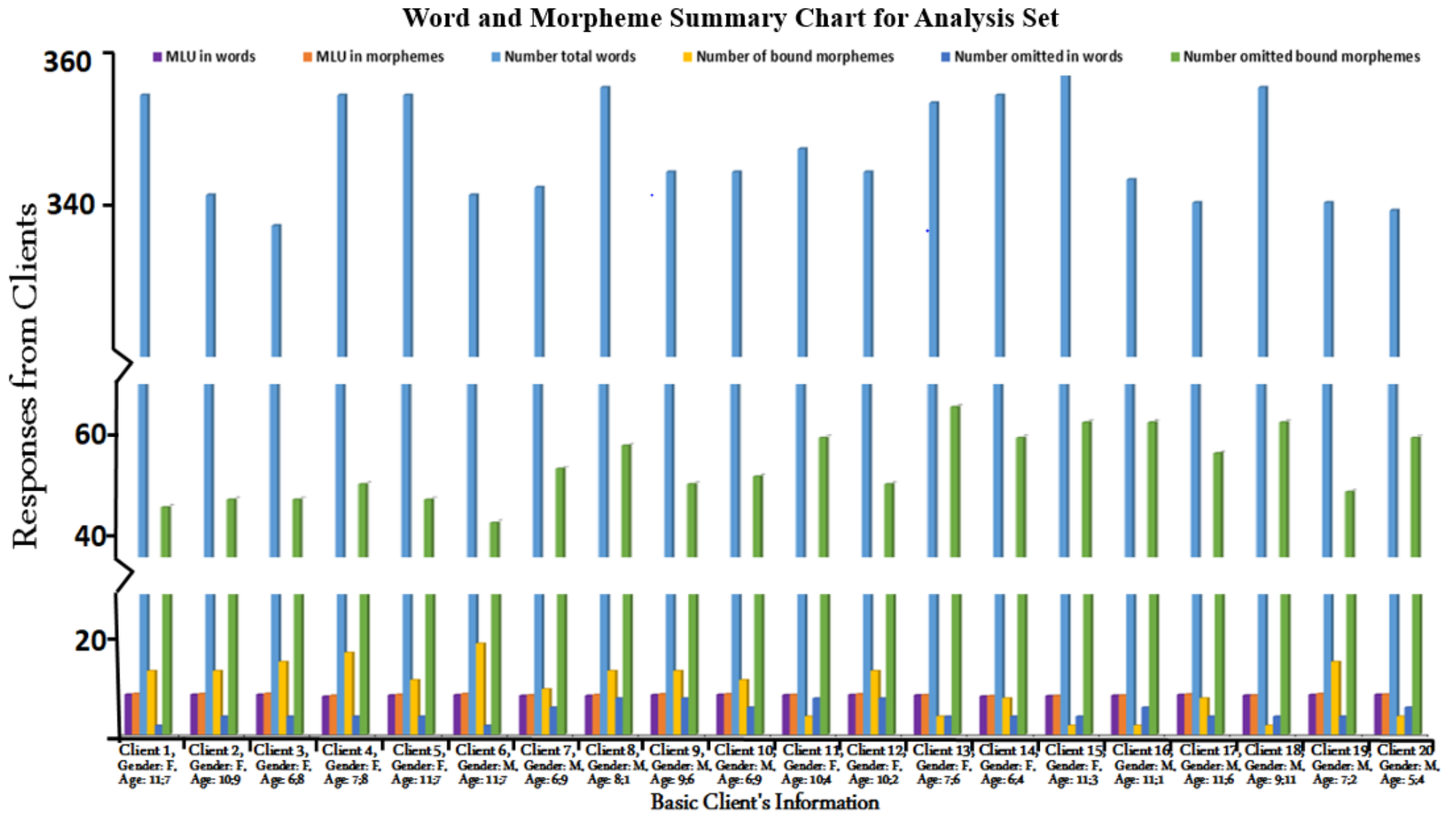


Figure 1. Word and morpheme summary for the analysis set

Figure 1 (above) summarizes the analysis set for word and morpheme responses from the participants under MLU in words, morphemes, number of total words, number of bound morphemes, number of omitted words, and number of omitted bound morphemes. It was observed that participants 1(F) and 6 (M) omitted the least number of words while participants 8 (M), 9 (M), 11 (F), and 12 (F) had the highest omitted number of words. Also, Participant 6 (M) had the least number of omitted bound morphemes while Participant 13 (F) had the highest number of omitted bound morphemes.

Figure 2 (below) shows the total utterances of the words and morphemes of the participants. It was observed that Participant 3 (F) had the least number of words produced while Participant 15 (F) had the highest number of words produced. Also, participants 15 (F), 16 (M), and 18(M) produced the least number of morphemes while participant 6(M) produced the highest number of morphemes.

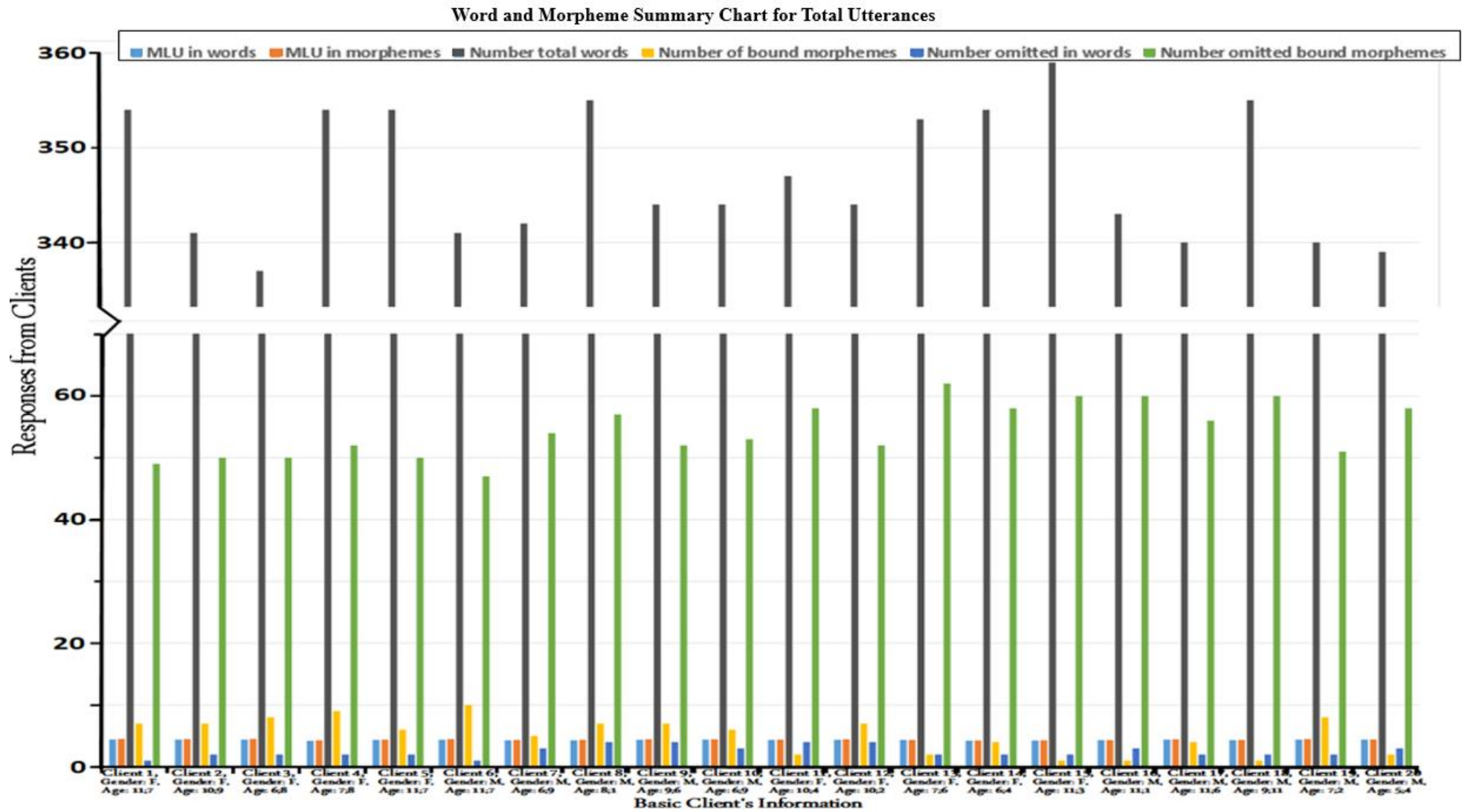


Figure 2. Word and morpheme summary for total utterances

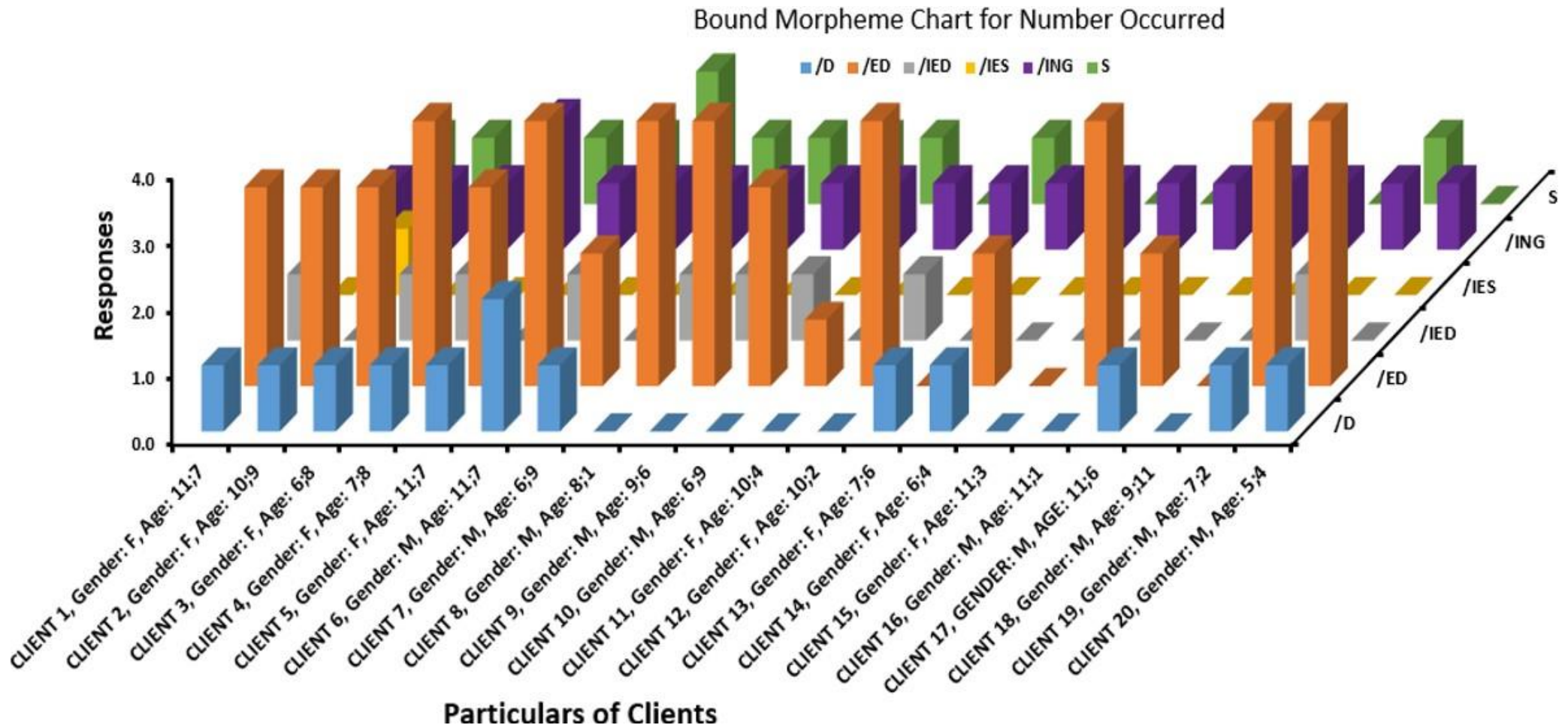


Figure 3. Bound morpheme chart for the number occurred

Figure 3 (above) shows the total number of past morphemes and plurals produced by the participants. The findings reveal that Participants. 12 (F), 13 (F), 15 (F), and 18(M) could not articulate the regular past morpheme (-*ed*) in their responses while Participants 4 (F), 6 (M), 8 (M), 9 (M), 12 (F), 15 (F), 19 (M) and 20 (M) produced the highest number of the regular past morpheme (-*ed*). In addition, for the articulation of the plural morpheme (-s), Participants 11(F), 13(F), 14(F), 15(F), 16(M), 17(M), 18(M), and 20(M) could not produce the plural (-s) at all, while participant 6 (M) had the highest production of plural morpheme (-s).

Figure 4 (below) shows the number of past morphemes (-*ed*) and plural morphemes (-s) omitted by the participants. The Figure shows that participant 12 (F) omitted the least number of plural morphemes while participant 13 (F) omitted the highest number. Also, participants 6(M), 9 (M), and 12 (F) omitted the least number of past morpheme (-*ed*) while participants 13 (F) and 15 (F) omitted the highest.

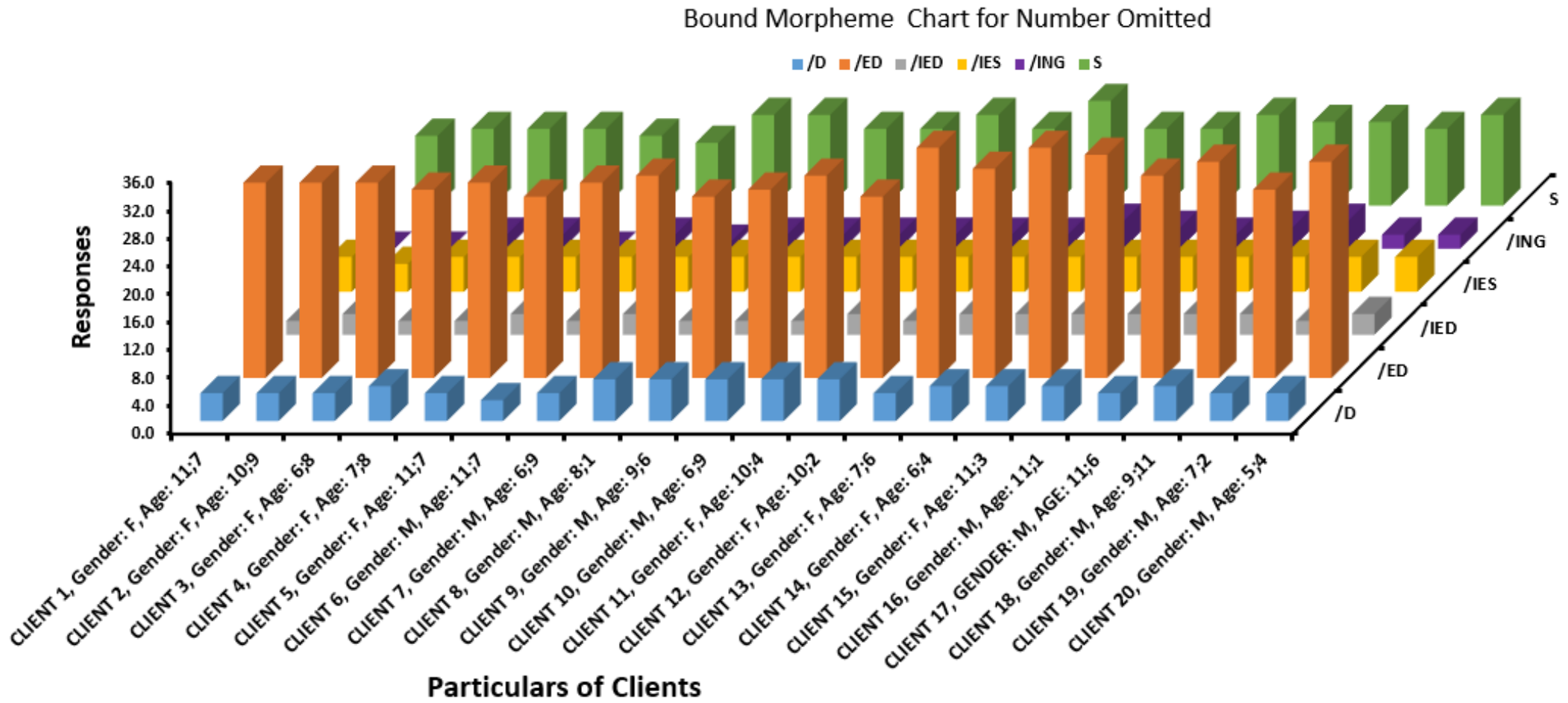


Figure 4: Omitted bound morphemes chart for the number omitted

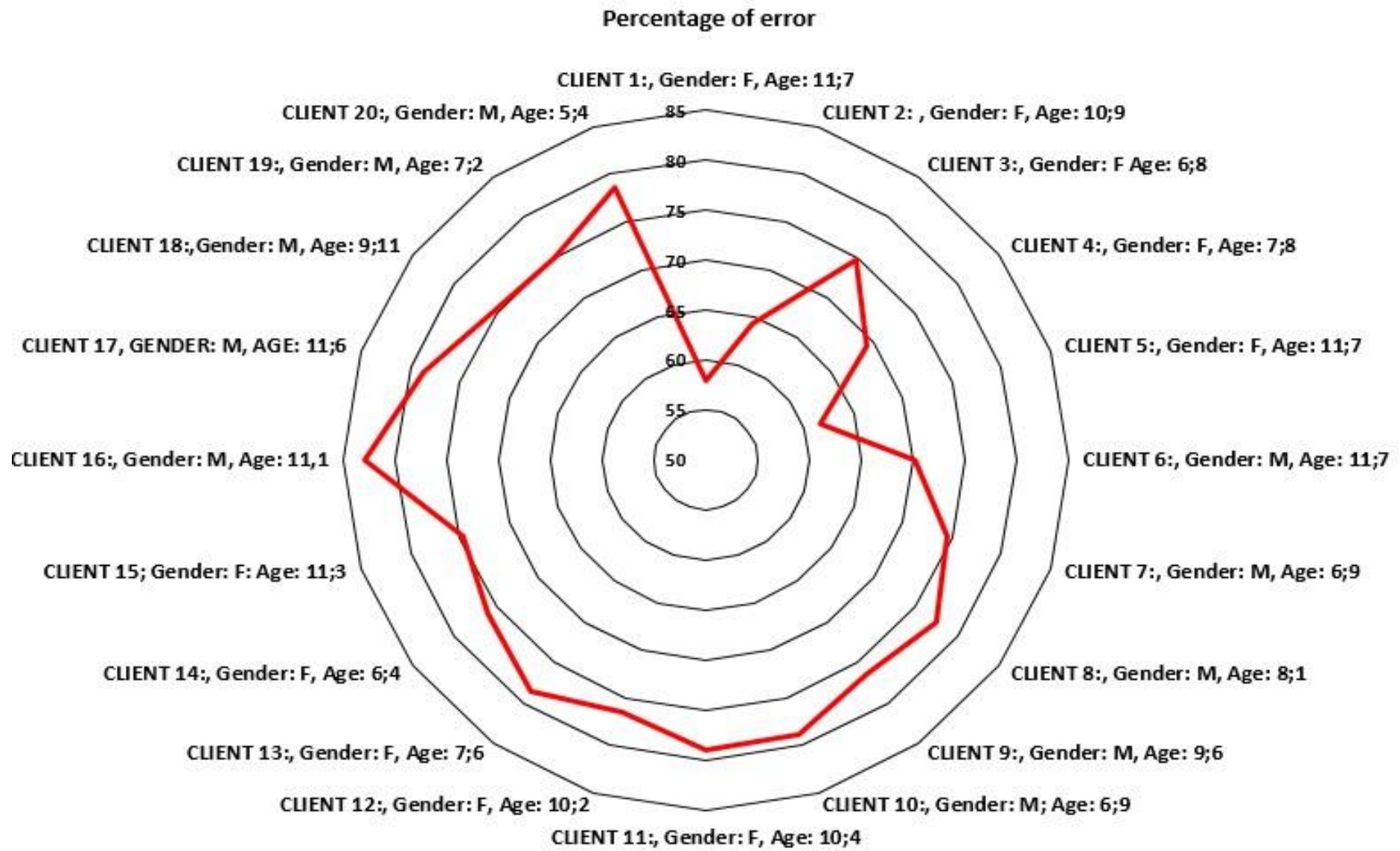


Figure 5. Summary chart for percentage of error



4. Discussion and conclusion

This research studied children with autism at the Our Lady of Guadalupe Health Autistic Centre in Rivers State. The objectives were to investigate the structural deficiencies in autistic children,

to look into the frequencies of morphological impairments in children with autism, and to document findings of the deficiency analysis for a therapy programme for children with ASD. The data were compiled using a variety of techniques for analysis. 20 autistic children with speech from the center, aged 5 to 12, were chosen.

The participants were given a passage of 100 utterances in the form of a narrative, entitled 'Frog where are you?'. Sentences with clues for regular past inflections and plural morphemes were offered. They were also given a word construction task using ten images. Systematic Analysis of Language Transcript (SALT) was used to record, transcribe, and analyse their responses.

Through the use of ADO's and ADI-R childhood autism diagnoses together with interviews and direct observation measures, the participants were identified as having undertaken the F84.0. I chose autistic children with modest symptoms who could still benefit from speech therapy.

The analysis established that the degree of errors, the MLU in word and morphemes for the production of past tense and plural morphemes for each participant were 57.95%, 64.29%, 74.70%, 69.23%, 61.54%, 70.24%, 74.42%, 77.53%, 76.47%, 78.82%, 79.07%, 76.47%, 78.65%, 76.09%, 74.73%, 83.91%, 78.57%, 75.28%, 75.00%, 78.57% respectively. The breakdown of the analysis shows that the MLUw and MLUm were below 5.0, which supports Paul's (2007) claim that those who speak with MLUm between 3.75 and 4.5 may pick up morphemes like regular past tense and third-person singular. The research demonstrates that the language systems of children with ASD reveal significant neuroimaging evidence that affects their communication proficiency.

The summary results for all the participants on the spider plot showing errors in percentages are shown in Figure 5. The result indicates that client 16, a male of eleven years and one month had the highest rate of errors, and client 1, a female of eleven years and seven months had the lowest percentage of errors. This supports the observation by Maenner (2023 et al) that boys score a higher percentage of ASD than girls.

The study concluded that the 20 children with autism who were chosen as participants exhibited some level of morphological deficiencies in their speech which possibly affected their interaction and free flow of communication. The findings of the analysis of each child constitutes the final analyses and results of this work which can be used to arrange appropriate assessment designs for a follow-up intervention by the speech therapists.

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