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The SMARE approach: A strategic metalinguistic framework for improving reading comprehension in deaf learners

Christine A. Patriana-Podadera*
Cebu Technological University-Main Campus, Cebu City, Philippines

ABSTRACT

Anchored in Special Education and deaf literacy, this study examined metalinguistic awareness and reading comprehension performance of deaf learners after exposure to the SMARE Approach. Metalinguistic awareness was assessed through morphological, syntactic, and semantic components, while reading comprehension covered literal, inferential, sequencing, and summarizing skills. Using a quantitative descriptive-correlational design, the study involved 30 deaf learners in Grades 4–8 from SPED and inclusive school settings in the Division of Butuan City through total enumeration. Researcher-developed Metalinguistic Awareness and Reading Comprehension Tests were administered. Data were analyzed using frequency, percentage, mean, standard deviation, One-Way ANOVA, and Pearson Product-Moment Correlation. Results showed a moderate level of metalinguistic awareness and moderate reading comprehension, with stronger performance in literal comprehension than in inferential, sequencing, and summarizing skills. No significant differences in performance were found across the profile variables examined. The findings indicate that metalinguistic skills remain relevant to the reading development of deaf learners, particularly for higher-order comprehension. The study supports the integration of structured morphological, syntactic, and semantic instruction into reading programs for deaf learners and recommends further research with larger and more diverse samples.

Keywords: SMARE Approach, metalinguistic awareness, reading comprehension, deaf learners, Special Education.

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INTRODUCTION

Reading comprehension is a fundamental academic skill that enables learners to understand, interpret, and evaluate written texts. It is a critical component of education, as it underpins learning across all subject areas. In the Philippine K to 12 curricula, the development of reading proficiency is emphasized to ensure learners acquire essential literacy skills and engage effectively in academic and social contexts. However, learners with hearing impairment face unique challenges in acquiring reading comprehension skills due to limited access to

*Corresponding author / Email: christinepodadera@gmail.com
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spoken language, reduced incidental language exposure, and differences between Filipino Sign Language (FSL) and written English.

In local educational settings, such as Libertad Central Elem. School, Butuan City SPED Center and Agusan National High School, deaf learners receive instruction through FSL or sign-supported strategies. Despite these provisions, many learners continue to demonstrate difficulties in comprehending texts beyond the literal level, particularly in higher-order skills such as inferential understanding, sequencing, and summarizing. These difficulties are influenced by limited early language input, structural differences between FSL and English, and instructional practices that rely heavily on phonological decoding, approaches that are not always effective for deaf learners.

Observations and assessment reports in these institutions indicate that while some learners can recognize words and recall explicitly stated information, they often struggle with tasks requiring inferential reasoning and organizing ideas. Such difficulties underscore the need for instructional strategies that address the specific linguistic and cognitive needs of deaf learners, particularly in SPED and inclusive classroom settings.

Research in literacy development has identified metalinguistic awareness as a critical factor influencing reading comprehension. Metalinguistic awareness refers to the ability to consciously reflect on and manipulate language structures, including morphology (word formation), syntax (sentence structure), and semantics (meaning). For deaf learners, strengthening metalinguistic awareness provides alternative pathways for understanding phonological processing of text independently. Explicit instruction in metalinguistic components has been associated with improved reading comprehension outcomes, particularly in populations with limited access to auditory language input.

To address these challenges, the present study applied the SMARE Approach (Strategic Metalinguistic Awareness for Reading Enhancement), a structured instructional framework designed to improve the reading comprehension of deaf learners through systematic metalinguistic instruction. The SMARE Approach emphasizes the development of morphological, syntactic, and semantic awareness using visual and sign-supported strategies appropriate for SPED and inclusive classrooms. It aligns with instructional practices employed in Butuan City SPED Center, Libertad Central Elem. School and Agusan National High School, with the goal of strengthening learners' ability to comprehend and analyze written texts.

The need for specialized reading instruction for deaf learners is supported by Philippine laws and policies that promote inclusive education. Republic Act No. 11106, or the Filipino Sign Language Act of 2018. The mandates of the use of FSL as the official language of the Filipino deaf community and ensures the recognition of FSL in education, government, and media. Additionally, the Department of Education (DepEd) Order No. 33, s. 2012, which implements the Enhanced Basic Education Act, emphasizes the integration of learners with special needs in inclusive classrooms and the provision of appropriate instructional materials and strategies. These policies underscore the obligation of educational institutions to provide accessible, effective, and evidence-based instruction to deaf learners, including interventions that enhance reading comprehension through language-focused strategies.

Although international studies have established a positive relationship between metalinguistic awareness and reading comprehension, there is limited empirical evidence within the Philippine context, particularly in public SPED centers and inclusive secondary schools in the Caraga Region. Most studies focus on hearing learners or are conducted in non-Philippine contexts, which may not reflect the linguistic environment, instructional practices, or learner profiles in schools utilized in the study. This gap highlights the need for context-specific research to guide instructional planning, teacher development, and curriculum design in Philippine deaf education.

In response to this need, the study employed a descriptive–correlational research design to determine the level of metalinguistic awareness and reading comprehension performance of deaf learners in Butuan City SPED Center, Libertad Central Elem. School and Agusan National High School after exposure to the SMARE Approach, and to examine the significant relationships between these variables. Specifically, the study focused on reading comprehension skills, including literal comprehension, inferential understanding, and sequencing and summarizing. The findings of this study are expected to provide empirical support for the integration of strategic metalinguistic instruction in SPED and inclusive classrooms, in alignment with national policies on inclusive education and the use of FSL.

Statement of the problem

The SMARE Approach (Strategic Metalinguistic Approach to Reading Enhancement) was developed to address this gap by explicitly teaching reading through structured metalinguistic strategies that are visually accessible and linguistically responsive to deaf learners. While the approach is theoretically grounded, limited empirical evidence exists regarding the relationship between learners' levels of metalinguistic awareness and their reading comprehension performance after exposure to the SMARE Approach, particularly within inclusive secondary schools and elementary Special Education (SPED) centers. This study determined the relationship between deaf learners' metalinguistic awareness and their reading comprehension performance after the implementation of the SMARE Approach in selected SPED schools in Butuan City Division, Butuan City, during School Year 2025–2026, as a basis for proposing SMARE instructional material.

Specifically, this study aimed to answer the following questions:

1. What is the demographic profile of the participants in terms of age, grade level, preferred communication modality, and type of school placement?
2. What is the level of metalinguistic awareness of deaf learners in terms of morphological awareness, syntactic awareness, and semantic awareness?
3. What is the level of reading comprehension performance of deaf learners after exposure to the SMARE Approach in terms of literal comprehension, inferential understanding, and sequencing and summarizing?
4. Is there a significant relationship between deaf learners' metalinguistic awareness and their reading comprehension performance after exposure to the SMARE Approach?
5. Which components of metalinguistic awareness are significantly associated with the reading comprehension performance of deaf learners after exposure to the SMARE Approach?
6. Is there a significant relationship between the participants' demographic profile and the metalinguistic awareness of deaf learners after exposure to the SMARE Approach?
7. Is there a significant relationship between the participants' demographic profile and the reading comprehension performance of deaf learners after exposure to the SMARE Approach?
8. What instructional enhancement plan for SPED programs may be proposed based on the findings of the study?

METHODOLOGY

This study employed a descriptive-correlational research design to examine the relationship between the participants' metalinguistic awareness and their reading

comprehension performance after exposure to the SMARE Approach. The descriptive aspect of the study began with the demographic profiling of participants. Information sheets were distributed for participants to fill out, gathering personal information such as age, grade level, preferred communication modality, and years spent in SPED self-contained classes. This profiling aimed to present the nature of the participants and its possible relationship to other study variables. The descriptive component was further utilized through the administration of the self-developed research instruments to measure the metalinguistic awareness and reading comprehension of the participants. The correlational aspect quantified the strength and direction of the relationship between participants' metalinguistic awareness, specifically morphological, syntactic, and semantic awareness, and their reading comprehension competencies, particularly literal comprehension, inferential understanding, sequencing, and summarizing. This component determined whether a statistically significant relationship existed between the participants' metalinguistic awareness and their reading comprehension skills before and after instruction using the SMARE framework. The design is deemed appropriate because it allows the researcher to analyze existing conditions without manipulating variables. Furthermore, identifying potential associations between participants' levels of metalinguistic awareness and their reading comprehension may inform pedagogical strategies suited for deaf learners and guide the development of instructional materials customized to their needs and learning profiles.

The flow of the study is anchored on the Input–Process–Output (IPO) framework, which systematically illustrates the variables and procedures involved in determining the relationship between deaf learners' metalinguistic awareness and their reading comprehension performance after exposure to the SMARE Approach. The framework provides a clear structure for describing the conditions, instructional exposure, assessment procedures, and resulting outcomes that guided the conduct of the study in selected SPED schools in the Butuan City Division during the school year 2025–2026. The flow of the study is presented in a figure depicting the three phases in sequence. The Input phase represents the baseline characteristics and measurable variables that describe the participants and their language-related competencies. It includes the demographic profile of the deaf learners, such as age, grade level, preferred communication modality, and number of years in SPED. These profile variables are essential in understanding the diversity of learner backgrounds and serve as correlates in determining their possible associations with metalinguistic awareness and reading comprehension performance. In addition to the participant profile, the input phase encompasses the metalinguistic awareness components of the deaf learners, specifically morphological awareness, syntactic awareness, and semantic awareness. These components reflect learners' ability to recognize and manipulate word forms, sentence structures, and meanings, which are foundational skills in reading comprehension. The input phase therefore establishes the descriptive data necessary for analyzing existing conditions and forms the basis for the subsequent correlational analysis.

The Process phase illustrates the instructional and methodological flow of the study. It begins with the exposure of the participants to the SMARE Approach, which emphasizes strategic metalinguistic instruction through sign-supported, visually mediated, and language-accessible reading activities. The SMARE Approach was implemented as part of the regular instructional context, ensuring that no experimental manipulation occurred, consistent with the descriptive–correlational design of the study. Following exposure, the process phase includes the systematic assessment and data collection procedures. Researcher-developed instruments were administered to measure the learners' levels of metalinguistic awareness and reading comprehension performance. These assessments were conducted after exposure to the SMARE Approach to capture learners' current competencies and instructional experiences. The process phase also involved organizing, coding, and preparing the gathered data for statistical analysis.

The Output phase represents the measurable outcomes derived from the input and process variables. The primary output of the study is the reading comprehension performance of deaf learners, assessed in terms of literal comprehension, inferential understanding, and sequencing and summarizing skills. These indicators provide a comprehensive view of learners' comprehension abilities across varying levels of cognitive demand. In addition, the output phase culminates in the development of a proposed SMARE instructional material for SPED programs. This instructional enhancement plan is grounded in the significant findings of the study, particularly the relationships identified between metalinguistic awareness components, learner profile variables, and reading comprehension performance, and it aims to strengthen instructional practices and support literacy development among deaf learners in SPED settings.

The IPO framework thus demonstrates the logical flow of the study, beginning with the description of learner characteristics and metalinguistic awareness (Input), followed by exposure to the SMARE Approach and assessment procedures (Process), and concluding with the analysis of reading comprehension outcomes and instructional implications (Output). Correlational analysis using Pearson r and Spearman ρ was employed to determine the degree of relationship among the identified variables without establishing causality. Overall, the IPO framework ensures coherence between the study's objectives, research questions, methodology, and outputs. It provides a systematic guide for examining how metalinguistic awareness and learner characteristics are associated with reading comprehension performance after exposure to the SMARE Approach, ultimately serving as a sound basis for proposing an instructional enhancement plan for SPED programs.

The study was conducted in the Division of Butuan City, one of the public-school divisions under the Department of Education (DepEd), Caraga Region (Region XIII). Butuan City serves as the regional center of Caraga and plays a vital role in educational planning, policy implementation, and innovation in the region. Its strategic location and administrative capacity make it a suitable environment for conducting educational research, particularly in the field of Special Education (SPED). The research was conducted in selected public elementary and high schools under the Butuan City Division, namely Agusan National High School, AD Curato St. Butuan City; Butuan City SPED Center, AD Curato St. Butuan City; and Libertad Central Elementary School, Libertad Butuan City.

Agusan National High School, the largest school in the entire Caraga region, serves 8,941 learners. Established in 1928 and located in the center of Butuan City, it is notably the only high school in the Butuan City Division to have implemented a Special Education (SPED) program since 2008. Initially, this program catered to 2 visually impaired learners and 3 students with intellectual disabilities. The school provides a resource room specifically designed for these learners, equipped with specialized learning tools and materials to meet their unique needs. Moreover, remedial classes and tutorial sessions are conducted in this room with the SPED teacher. It was not until 2010, two years after the program's inception, that deaf learners began enrolling. The school embraces inclusive education, integrating students with special needs into mainstream classrooms. In addition to its SPED program, Agusan National High School offers various specialized programs, including the Special Program in the Arts (SPA), Special Program in Sports (SPS), Special Program in Foreign Languages (SPFL), Special Program in Journalism (SPJ) and the Open High School Program (OHSP).

Butuan City SPED Center is an empowered school, committed to provide equal education climate and opportunities to gifted/ differently– abled children based on their unique level of potential and capacity to adapt to the modern trends of society. The school is dedicated to fulfilling its vision by offering a modified curriculum tailored to the assessed needs of differently abled learners. This curriculum focuses on developing essential skills such as social

communication, sensory-motor abilities, basic academics, and livelihood skills. These components are crucial for the learners' successful integration into regular classes and their eventual participation in the broader community. The center also provides specialized SPED programs and services for gifted and talented children to help them achieve their full potential and contribute to societal enhancement. It supports teachers' professional growth and development through access to training, seminars, and scholarship opportunities, and builds strong partnerships with the PTA, local government units (LGUs), NGOs, alumni, private individuals, and international advocates. Most importantly, it establishes a safe and conducive learning environment with updated facilities to meet the needs of both SSES (Specialized Support and Educational Services) and DA (Differently abled) learners.

The Libertad Central Elementary School (LCES) was formerly named Libertad Barangay High School and is located at Libertad, Butuan City. It was founded in 1969 and was nationalized on June 24, 1984, by virtue of Batas Pambansa 584 sponsored by the then Cong. Jose T. Sison. Its land area is 4 hectares, earmarked as government property by virtue of Municipal Resolution No. 41 s. 1977. It has today a 108 Plantilla itemized position for faculty and staff with its Colongulo Elementary School Campus. LCES Main has 2,265 students with 46 sections. LCES caters to the General Elementary Curriculum with specialized subjects in Technology and livelihood Education, has internet connectivity, and is 95% secured with a concrete perimeter fence. At present, under the leadership of its energetic principal Mr. Ruel C. Gabor, together with the strong support of the faculty and staff, parents, students, LGU, and other sectoral representatives, LCES is on the forefront of working hard for gaining more in terms of institutional performance. The school's best practices include on-going special programs such as the Drop Out Reduction Program, Summer Reading Program, Enhancement and Enrichment Classes, NEPP Mentoring Program, School Search for Clean and Beautiful Classroom, Department Meetings, Brigada Eskwela Year-Round, and Adolescent Seminar for Students. LINHS is hosting Zone Meets, Provincial Meet, Provincial STEP Conference, Division Programs and activities, and Examination Center for ALS, MSU, etc. The mission of LCES is to provide quality basic education that is accessible to all and lays the foundation of lifelong learning and service for the common good, and it envisions that by 2030, LCES is globally recognized for good governance and for developing functionally literate and God-loving Filipinos.

The study was thus conducted at Agusan National High School (ANHS), Libertad Central Elementary School (LCES), and the Butuan City Special Education Center (BCSPED), schools located in Butuan City, Philippines. These institutions were selected as the research locale because they implement inclusive education programs and provide instructional services to learners who are deaf or hard of hearing. The location of the research environment is shown in a map retrieved from https://tools.paintmaps.com/map-cropping/PH/4-1108697145/samples, which serves as the location map of the research environment.

The participants of the study include Grade 7-8 deaf learners from Agusan National High School (ANHS), as well as Grade 4-6 learners from Libertad City Elementary School (LCES) and Butuan City SPED Center for the school year 2025-2026. Across grade levels, deaf learners are frequently reported to demonstrate lower reading proficiency compared to their hearing peers. However, as the English teacher to Junior High School deaf learners, the researcher aimed to effectively implement the acquired reading skills at the beginning of high school and the end of elementary school. The focus will be on developing reading skills in these specific grade levels, which are known for their adaptability to educational innovations. The goal is to maximize and demonstrate the efficacy of the applied strategies, ensuring that the improvements continue as these learners progress through high school.

A minimum sample size of 30 participants was identified to ensure sufficient statistical power for conducting correlational analysis, in line with commonly accepted guidelines for

quantitative educational research. According to Creswell and Creswell (2017), correlational research does not require large samples when participants are deliberately selected based on their relevance to the phenomenon under investigation. The purposive sampling procedure was appropriate for this study because it allowed the selection of participants who possessed specific characteristics that were directly aligned with the objectives of the research. In inclusive education studies, purposive sampling is commonly employed when the focus is on individuals who have direct experience, exposure to the phenomenon being examined. According to Creswell and Poth (2016), purposive sampling enables researchers to intentionally select participants who can provide rich, detailed, and relevant information about the research problem. This approach ensured that the data gathered were meaningful and grounded in actual practice rather than drawn from a general population with limited exposure to the issue under investigation. Moreover, purposive sampling, a non-probability sampling technique, intentionally selected participants based on specific characteristics relevant to the objectives of the research. In this case, participants were deaf learners who met the established inclusion criteria and had been exposed to SMARE-based instruction.

The use of purposive sampling was appropriate because the study sought to examine the relationship between metalinguistic awareness and reading comprehension performance following a specialized instructional approach. Random sampling would be impractical, as SMARE-based instruction was implemented only in selected educational settings and among a specific population. The study ensured that by deliberately selecting learners who have experienced this instructional framework, the data collected were directly aligned with the research variables and research questions, thereby enhancing the relevance and internal validity of the findings. Moreover, purposive sampling was employed to select participants who meet the predefined inclusion criteria, specifically deaf learners who were exposed to SMARE-based instruction. This technique is considered appropriate as it ensures that participants possess the relevant instructional experience necessary for examining the relationship between metalinguistic awareness and reading comprehension. A minimum sample size of 30 participants was identified to ensure sufficient statistical power for conducting correlational analysis, in line with commonly accepted guidelines for quantitative educational research.

Participants in the study were medically diagnosed as either profoundly hearing-impaired (HI) or hard of hearing (HH). Regarding their economic status, 25% of them are classified as being of average economic standing, while a significant 75% fall below the poverty line. The distribution of participants across the research locales is as follows. Agusan National High School, located at A.D. Curato St., Butuan City, contributed a frequency (F) of 15 participants, corresponding to 50%. Libertad Central Elementary School, located at Brgy. Libertad, Butuan City, contributed an F of 5, corresponding to 17%. Butuan City SPED Center, located at A.D. Curato St., Butuan City, contributed an F of 10, corresponding to 33%. The total number of participants was 30, with the percentage entry for the total shown as 10 in the original distribution table.

The instruments assessed participants' morphological, syntactic, and semantic awareness, providing a clear profile of their metalinguistic abilities in both sign and oral language. In addition, participants' reading comprehension performance was assessed before and after exposure to the SMARE Approach, focusing on literal comprehension, inferential understanding, sequencing, and summarizing skills. As stated earlier, this study employed a descriptive–correlational research design to examine the relationship between participants' metalinguistic awareness and their reading comprehension performance. To obtain the necessary data, three instruments were utilized, namely the Metalinguistic Awareness Test, the Reading Comprehension Test, and the Demographic Profile Questionnaire.

The Metalinguistic Awareness questionnaire used in this study was a researcher-made instrument modified to ensure appropriateness for deaf learners. The test was designed to measure students' ability to consciously reflect on and manipulate language structures, consistent with Gombert's (1992) Metalinguistic Awareness Theory. The Metalinguistic Awareness Test, consisting of 30 multiple-choice items, was subjected to a reliability analysis using Cronbach's alpha to determine its internal consistency. The analysis yielded a Cronbach's alpha coefficient of $\alpha = 0.87$, indicating high internal consistency among the test items. This suggests that the instrument reliably measures learners' metalinguistic awareness across morphological, syntactic, and semantic components. According to George and Mallery (2003), a Cronbach's alpha value above 0.80 is considered good, while values above 0.90 indicate excellent reliability. Thus, the obtained reliability coefficient confirms that the Metalinguistic Awareness Test is a reliable research instrument for use among deaf learners in the present study.

The instrument consists of three subtests corresponding to key components of metalinguistic awareness. The Morphological Awareness Subtest assesses learners' understanding of word structure, including root words, prefixes, and suffixes. Test items require learners to identify base words, recognize affixes, and determine how morphological changes affect word meaning, and visual supports and context-based examples were incorporated to accommodate the language needs of deaf learners. The Syntactic Awareness Subtest measures learners' ability to recognize, analyze, and manipulate sentence structures. Items include identifying grammatically correct sentences, rearranging words to form meaningful sentences, and recognizing errors in sentence construction, and the subtest focuses on learners' awareness of how word order and sentence patterns contribute to meaning. The Semantic Awareness Subtest evaluates learners' understanding of word meanings and their ability to interpret words and phrases within context. Learners are asked to determine appropriate meanings of words in sentences, identify synonyms or related meanings, and distinguish between multiple meanings of words based on contextual clues.

The researcher-developed Reading Comprehension Test was designed to assess the reading comprehension abilities of deaf learners. The test was carefully planned to ensure linguistic accessibility, clarity of instructions, and suitability for learners receiving instruction through Filipino Sign Language (FSL) or sign-supported communication. The Reading Comprehension Test, consisting of 30 multiple-choice items, was subjected to reliability analysis using Cronbach's alpha to determine its internal consistency. The test measures learners' reading comprehension skills across several domains, including literal comprehension, inferential comprehension, vocabulary in context, sequencing, cause-and-effect relationships, and identification of main ideas. The reliability analysis yielded a Cronbach's alpha coefficient of $\alpha = 0.88$, indicating good internal consistency among the test items. This result suggests that the items are sufficiently correlated and consistently measure the construct of reading comprehension. According to George and Mallery (2003), a Cronbach's alpha value ranging from 0.80 to 0.89 reflects good reliability, while values of 0.90 and above indicate excellent reliability. Therefore, the Reading Comprehension Test is considered a reliable research instrument and is appropriate for use in assessing learners' reading comprehension performance in the present study.

The instrument measures reading comprehension across three key domains. The literal comprehension component assesses learners' ability to understand information that is explicitly stated in the text. Items require learners to identify facts, details, characters, settings, and events directly presented in reading passages, and this component evaluates basic understanding and accurate recall of textual information without requiring interpretation beyond what is clearly stated. The inferential understanding component measures learners' ability to derive meaning that is implied rather than directly stated in the text. Items require learners to make logical

inferences, predict outcomes, identify implied relationships, and determine causes and effects based on textual clues, and this component reflects higher-order comprehension skills and the ability to integrate background knowledge with textual information. The sequencing and summarizing component evaluates learners' ability to organize ideas and identify the main ideas of a text. Sequencing items require learners to arrange events or ideas in their correct chronological or logical order, while summarizing items assess learners' ability to identify key points and condense information without altering the original meaning, and this component reflects learners' understanding of text structure and coherence.

The Reading Comprehension Test is scored by assigning one point for each correct response. Sub scores are computed for literal comprehension, inferential understanding, and sequencing and summarizing, as well as an overall reading comprehension score. Higher scores indicate higher levels of reading comprehension. The resulting data serve as the dependent variable in the correlational analysis examining its relationship with students' metalinguistic awareness. The literal comprehension of the deaf learners mostly relies on recognition and recall of linguistic forms, and metalinguistic awareness supports identifying words, sentence patterns, and explicitly stated information. In inferential comprehension, learners move beyond surface-level reading by interpreting morphological, syntactic, and semantic cues to construct meaning not directly stated in the text. Furthermore, in sequencing, summarizing, and overall comprehension, learners actively use metalinguistic knowledge to organize information, understand text flow, and integrate meanings across sentences and paragraphs.

The Demographic Profile Questionnaire was a researcher-developed instrument used to gather essential background information about the participants. The data obtained were utilized to describe the sample characteristics and to provide contextual information necessary for interpreting the relationship between metalinguistic awareness and reading comprehension among deaf learners. The questionnaire includes items related to the participants' age and grade level, which provide baseline information regarding their developmental and academic standing. It also gathers data on learners' preferred communication modality, such as Filipino Sign Language (FSL), sign-supported instruction, or other modes of communication, to help contextualize language exposure and instructional experiences. In addition, the instrument includes items on the number of years enrolled in Special Education (SPED) programs, which reflect the length of formal educational support received by the learners. Other relevant demographic variables may include type of school placement (e.g., SPED center or inclusive school) and language exposure at home or school, as deemed necessary for accurately describing the participants.

The questionnaire is structured around four profile variables, each with a description, response options, and level of measurement. Age, described as the chronological age of the learner, is answered by writing the number of years old and is treated at the ratio level of measurement. Grade level, described as the current grade level of the learner, is answered by writing the grade and is treated at the ordinal level. Primary language used, described as the main language for communication, is answered by selecting Filipino Sign Language, Sign-Supported English, or Other with a space to specify, and is treated at the nominal level. Type of school placement, described as the educational setting of the learner, is answered by selecting SPED Center or Inclusive School and is treated at the nominal level. Data obtained from these items will be analyzed using frequency and percentage distribution. The variables provide descriptive context and are not treated as independent variables in the correlational analysis. The questionnaire ensures clarity, standardization, and accessibility for deaf learners.

Before the conduct of the study, the researcher sent a formal letter to the Schools Division Superintendent to seek permission to conduct the research. Once approval was

granted, similar letters were forwarded to the school principals to secure their consent and support in administering the research instrument. After obtaining the necessary approvals, the final version of the questionnaire was prepared based on the results of the reliability testing. The instruments were then converted into hard copies for convenient distribution and collection of responses. They were given to the identified schools through the assistance of their SPED and English teacher, with clear instructions regarding the purpose of the study, procedures for answering, and the duration of the data collection period. Within the given instruments, an introductory letter was included to inform participants about the nature and objectives of the study. This letter explained their role as participants and emphasized that their involvement was voluntary. It also indicated that they had the freedom to decline participation or leave any question unanswered if they felt uncomfortable. Only those who provided their consent through the form would continue and participate in the conduct of the study.

Before the administration of the research instruments, an orientation was conducted to familiarize the participants with the purpose of the study and the tasks they were expected to perform. The orientation was delivered using accessible communication modes, including Filipino Sign Language (FSL), sign-supported instruction, and visual aids, to ensure full comprehension. Participants were informed that their responses would be kept confidential and that they could withdraw from the study at any time without any academic consequences. The Metalinguistic Awareness Test and the Reading Comprehension Test were administered in a quiet, well-lit, and controlled classroom setting. Clear and standardized instructions were provided using appropriate visual and signed support. The tests were administered during regular school hours, and sufficient time was allotted to allow participants to complete each instrument without pressure. Clarifications were provided only to explain instructions and did not include any guidance that could influence learners' responses.

The Demographic Profile Questionnaire was administered either prior to or immediately after the tests to gather relevant background information about the participants. Assistance was provided, when necessary, to ensure that learners clearly understood each item, particularly those related to communication modality and educational background. After the administration of all instruments, learners' responses were collected, checked for completeness, and coded using numerical identifiers to ensure anonymity. All hard copies of the data were securely stored, while electronic files were password-protected and accessible only to the researcher. The collected data were used solely for the purposes of this study and were analyzed in aggregate form. Following the data collection period, the researcher retrieved and consolidated all accomplished instruments. The gathered information was then encoded and analyzed using appropriate statistical tools. The data gathering procedure was carried out in a systematic and ethical manner to ensure the accuracy, reliability, and validity of the data collected from deaf learners.

Prior to the conduct of the study, formal approval was obtained from the concerned school administrators of the participating SPED centers and inclusive schools. Ethical clearance was also secured from the appropriate institutional ethics review committee. Written informed consent was obtained from the parents or legal guardians of the learner participants, while learner assent was secured to ensure voluntary participation. Coordination meetings were conducted with school heads and SPED teachers to discuss the objectives of the study, the instruments to be used, the schedule of data collection, and the procedures to be followed. Hence, this study was conducted in accordance with established ethical standards to protect the rights, dignity, and welfare of the participants, particularly deaf learners. The purpose of the study, procedures involved, potential risks and benefits, and the voluntary nature of participation were clearly explained using accessible communication modes, including Filipino Sign Language (FSL) and visual supports.

The identities of all participants were protected throughout the duration of the study. Participants were assigned numerical codes in place of names to ensure anonymity. All data collected were treated with strict confidentiality and were used solely for research purposes. Hard copies of research instruments were securely stored, and electronic data were password-protected and accessible only to the researcher. Participation in the study was entirely voluntary. Participants were informed that they could withdraw from the study at any time without penalty or negative consequences, and withdrawal did not affect their academic standing or access to educational services. All research instruments were administered with appropriate accommodations to ensure accessibility for deaf learners. These included the use of Filipino Sign Language (FSL) interpreters, sign-supported instruction, visual materials, and clear written instructions. Accommodation was provided to support comprehension without influencing students' responses or outcomes.

Because this study involved minor participants, it was conducted in compliance with institutional child-protection policies and ethical standards for research involving children. All research activities were carried out within the school premises and in the presence or with the knowledge of authorized school personnel. The researcher always maintained professional boundaries and ensured that interactions with participants were strictly related to the research procedures. No physical, psychological, or emotional harm was inflicted upon the participants. Any concern related to a child's safety or well-being observed during the conduct of the study would be reported immediately to the appropriate school authorities in accordance with established child-protection protocols. All data collected were retained solely for academic and research purposes. Hard copies of research instruments and consent forms were securely stored in a locked cabinet, while electronic data files were password-protected and accessible only to the researcher. In accordance with institutional research guidelines, the data will be retained for a specified period (e.g., three to five years) following the completion of the study to allow for academic review or audit, after which all identifiable data will be permanently destroyed. Paper-based records will be shredded, and electronic files will be securely deleted to ensure continued confidentiality and protection of participants' information.

The study utilized a descriptive–correlational research design, and the collected data were analyzed using both descriptive and inferential statistics to address the research questions and test the hypotheses. Descriptive statistics were used to summarize the demographic profile of the participants and the distribution of scores in both the Metalinguistic Awareness Test and the Reading Comprehension Test. Measures such as mean, standard deviation (SD), frequency, and percentage were computed to provide an overview of the data. To determine the strength and direction of the relationship between students' metalinguistic awareness and reading comprehension performance, the Pearson Product–Moment Correlation Coefficient (r) was computed. Correlations were analyzed not only for the overall scores but also for the specific subcomponents of each instrument. The metalinguistic awareness subcomponents were morphological awareness, syntactic awareness, and semantic awareness, while the reading comprehension subcomponents were literal comprehension, inferential understanding, and sequencing and summarizing. This allowed the researcher to examine the relationship between each metalinguistic component and each reading comprehension component, providing a detailed understanding of which aspects of metalinguistic awareness are most strongly associated with specific reading comprehension skills.

Age was treated as a ratio-level variable because it possesses a true zero point and equal intervals between values. As a ratio variable, age allows for meaningful comparisons of magnitude, as when a learner who is 14 years old is twice as old as a learner who is 7 years old. This level of measurement permits the use of more advanced statistical procedures compared

to nominal or ordinal variables. To determine the profile of the learners in terms of age, descriptive statistics were employed. Specifically, the mean (M) was computed to determine the average age of the learners, the standard deviation (SD) to measure the variability or dispersion of ages, the minimum and maximum values to identify the age range of the participants, and the range to determine the spread between the youngest and oldest learners. These statistical measures provided a clear description of the chronological age distribution of the participants. Since age is measured in years and has a true zero point, it qualifies as a ratio variable, allowing for meaningful interpretation of differences and proportional comparisons among learners.

Grade level was treated as an ordinal variable because it represents ordered categories like Grade 5, Grade 6, Grade 7 & 8, where the categories follow a logical sequence but the intervals between them are not assumed to be equal. While Grade 6 is higher than Grade 5, and Grade 7 is lower than Grade 8, the difference in academic difficulty or developmental progression between grade levels cannot be assumed to be uniform. Therefore, grade level is classified as an ordinal level of measurement. To determine the profile of the participants in terms of grade level, descriptive statistics appropriate for ordinal data were employed. Frequency counts (f) were used to determine the number of learners in each grade level, and percentages (%) were computed to describe the proportion of learners per grade level. If necessary, the median grade level was identified to determine the central tendency of the distribution. The results were presented using a frequency and percentage distribution table to clearly describe how participants were distributed across grade levels, providing a clear overview of the academic placement of the deaf learners included in the study. Since grade level is ordinal in nature, parametric statistics such as mean and standard deviation were not primarily used to describe this variable. Instead, emphasis was placed on distributional measures that appropriately reflect its categorical and ordered characteristics.

Primary language used was treated as a nominal variable because it classifies participants into distinct categories without any inherent order or ranking. The response options, namely Filipino Sign Language (FSL), Sign-Supported English (SSE), and Home Signs, represent different communication modalities used by the learners for daily interaction. Since these categories are mutually exclusive and do not follow a hierarchical structure, nominal-level statistical procedures were applied. To determine the profile of the participants in terms of primary language used, frequency counts (f) were computed to determine the number of learners in each language category, and percentages (%) were calculated to show the proportion of participants using each primary language. The results were presented in a frequency and percentage distribution table to clearly describe the linguistic background of the participants, which allows for straightforward comparison of how learners are distributed across communication modalities. Measures of central tendency such as mean and median were not computed because they are not appropriate for nominal-level data. Instead, categorical distribution analysis was used to accurately summarize and interpret the participants' primary language profile. The analysis of primary language used is particularly important in deaf education research, as language modality significantly influences literacy development, reading comprehension, and access to instruction.

Educational setting, or school placement, was likewise treated as a nominal variable because it consists of categorical classifications without any inherent order. The categories, namely SPED Center and Inclusive School, represent distinct educational placements of the learners but do not imply ranking or hierarchy. Since nominal variables only identify group membership, they are analyzed using non-parametric descriptive statistics. To determine the profile of the participants in terms of educational setting, frequency counts (f) were used to determine the number of learners enrolled in SPED Centers and Inclusive Schools, and percentages (%) were computed to describe the proportion of participants in each educational

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setting. The results were presented using a frequency and percentage distribution table to clearly illustrate the distribution of learners according to school placement. This method provides a straightforward and appropriate summary for nominal-level data. Since educational setting is nominal in nature, measures of central tendency such as mean or median were not computed. Instead, categorical distribution analysis was used to accurately describe the participants' placement characteristics.

The rubric developed for this study was used to assess the learners' metalinguistic awareness. It consists of clearly defined criteria with corresponding performance descriptors and numerical scores to ensure objective and consistent evaluation. Scores were converted to percentage equivalents for ease of interpretation, and the rubric was used to determine learners' levels of metalinguistic awareness in the morphological, syntactic, and semantic domains and to support statistical analyses. A score range of 81–100% corresponds to the Very High level, at which learners accurately identify and manipulate word parts and demonstrate strong understanding of word formation (morphological awareness), consistently recognize correct sentence structure and grammatical relationships (syntactic awareness), and accurately interpret word meanings and relationships across contexts (semantic awareness). A score range of 61–80% corresponds to the High level, at which learners correctly identify most word parts with minimal errors and show good understanding of morphological rules, demonstrate good understanding of sentence patterns with minor grammatical errors, and demonstrate good understanding of word meanings with occasional difficulty. A score range of 41–60% corresponds to the Moderate level, at which learners identify basic word parts but show partial or inconsistent understanding, understand basic sentence structure but struggle with complex constructions, and understand literal meanings but struggle with nuanced or contextual meanings. A score range of 21–40% corresponds to the Low level, at which learners demonstrate limited ability to recognize or manipulate word forms, limited awareness of sentence structure and grammar, and limited understanding of word meanings and relationships. A score range of 0–20% corresponds to the Very Low level, at which learners show minimal to no understanding of word structure and morphology, are unable to identify or apply basic syntactic rules, and show minimal or no understanding of word meanings.

The rubric provides a structured framework for evaluating the three key components of morphological awareness, syntactic awareness, and semantic awareness. Each component is assessed using a percentage-based scoring system ranging from 0% to 100%, divided into five interpretive levels: Very Low, Low, Moderate, High, and Very High. This rubric provides a clear, objective, and standardized framework for assessing the metalinguistic skills of deaf learners across the three domains of language awareness. Through the alignment of percentage scores with descriptive performance levels, researchers and educators can quantify proficiency in each domain, identify strengths and weaknesses in morphological, syntactic, and semantic skills, guide instructional planning tailored to the linguistic needs of deaf learners, and support correlational analyses linking metalinguistic awareness to reading comprehension, grade level, and language modality. The rubric also ensures consistency in scoring and facilitates reliable interpretation of results in a descriptive–correlational research design.

Reading comprehension performance was likewise interpreted through a rubric. Scores were converted to percentage equivalents for ease of interpretation and were used to describe the learners' reading comprehension performance after exposure to the SMARE Approach. A score range of 81–100% corresponds to the Very High level, at which learners accurately identify all or almost all explicitly stated facts and details in the text (literal comprehension), consistently make accurate inferences and interpretations based on textual evidence (inferential understanding), and accurately sequence events and produce a clear, coherent summary

capturing main ideas (sequencing and summarizing). A score range of 61–80% corresponds to the High level, at which learners correctly identify most explicit information with minor errors, make appropriate inferences with minimal difficulty, and correctly sequence most events and provide an adequate summary. A score range of 41–60% corresponds to the Moderate level, at which learners identify some explicit details but miss key information, make basic inferences but struggle with deeper interpretation, and partially sequence events and provide an incomplete or unclear summary. A score range of 21–40% corresponds to the Low level, at which learners demonstrate limited ability to identify explicit information, limited ability to infer meaning beyond explicit content, and difficulty sequencing events and summarizing key ideas. A score range of 0–20% corresponds to the Very Low level, at which learners are unable to identify basic explicitly stated facts or details, unable to make logical inferences from the text, and unable to sequence events or summarize the text. This rubric allows for a systematic and objective evaluation of reading comprehension, enabling the researcher to quantify the learners' performance and identify areas of strength and difficulty. It is particularly suitable for deaf learners, as it addresses multiple levels of comprehension, from literal understanding to higher-order thinking skills, which are critical in assessing reading proficiency in this population. The rubric not only provides scores for statistical analysis but also facilitates descriptive interpretation of the participants' reading comprehension levels, which is essential for linking metalinguistic awareness to reading performance.

To determine the significant relationship between metalinguistic awareness and reading comprehension after exposure to the SMARE Approach, correlation coefficients (r-values) and significance levels (p-values) were computed between the subcomponents of metalinguistic awareness, namely morphological, syntactic, and semantic awareness, and the subcomponents of reading comprehension, namely literal comprehension, inferential understanding, sequencing and summarizing, as well as overall reading comprehension scores. An overall metalinguistic awareness score was also correlated with each reading comprehension measure. The results are to be reported in a matrix in which each cell contains the entry r = ___, p = ___ for the pairing of each metalinguistic awareness component (Morphological Awareness, Syntactic Awareness, Semantic Awareness, and Overall Metalinguistic Awareness) with each reading comprehension measure (Literal Comprehension, Inferential Understanding, Sequencing & Summarizing, and Overall Comprehension).

Morphological awareness reflects a learner's understanding of root words, prefixes, and suffixes. A high positive r-value with literal comprehension suggests that learners who can manipulate morphemes accurately are better at recalling explicitly stated information. Significant correlations with inferential understanding or sequencing and summarizing indicate that morphological knowledge also supports higher-order comprehension skills, such as drawing inferences and organizing ideas logically. Syntactic awareness measures the ability to recognize and manipulate sentence structures. Strong correlations with literal comprehension suggest that learners who understand sentence grammar can extract information more accurately, while correlations with inferential understanding and sequencing and summarizing indicate that syntactic knowledge facilitates comprehension of relationships between ideas and overall text coherence. Semantic awareness involves understanding word meanings in context. High correlations with literal and inferential comprehension indicate that learners who can interpret meanings accurately are better able to understand both explicit and implicit information, and significant correlations with sequencing and summarizing show that semantic understanding also contributes to the ability to identify main ideas and organize information. The overall metalinguistic awareness score represents the combined effect of morphological, syntactic, and semantic awareness, and its correlations with reading comprehension subcomponents reflect the cumulative contribution of metalinguistic skills to overall reading performance. Significant positive correlations indicate that students with higher metalinguistic

awareness tend to perform better across all aspects of reading comprehension, supporting the premise of the SMARE framework.

The p-values indicate whether the observed correlations are statistically significant. A p-value of $p \leq 0.05$ shows that the correlation is unlikely to have occurred by chance, suggesting a meaningful relationship between the subcomponents, whereas $p > 0.05$ indicates that the observed correlation is not statistically significant and may have occurred due to random variation. In the reporting of results, r denotes the Pearson correlation coefficient and p denotes the significance value. The r-value, or Pearson Product–Moment Correlation Coefficient, measures the strength and direction of a linear relationship between two continuous variables. In this study, it is used to assess the relationship between metalinguistic awareness (and its subcomponents) and reading comprehension (and its subcomponents) among deaf learners. The strength of the relationship is interpreted using the following scale: an r-value of 0.00—0.19 is interpreted as Very weak, 0.20--0.39 as Weak, 0.40—0.59 as Moderate, 0.60—0.79 as Strong, and 0.80—1.00 as Very strong.

A Very weak correlation (0.00–0.19) indicates that there is little to no linear relationship between the two variables. For example, if Morphological Awareness and Literal Comprehension had an r-value of 0.12, it would suggest that knowledge of word structure contributes minimally to students' ability to recall explicit text information. A Weak correlation (0.20–0.39) shows a slight positive or negative relationship. While the variables are related to some extent, the association is not strong enough to reliably predict one variable based on the other. In practical terms, a weak correlation may suggest that other factors besides metalinguistic awareness also influence reading comprehension. A Moderate correlation (0.40–0.59) indicates a noticeable, meaningful relationship between the two variables. For instance, an r-value of 0.52 between Semantic Awareness and Inferential Understanding would suggest that understanding word meanings in context has a meaningful influence on the learner's ability to draw inferences. A Strong correlation (0.60–0.79) reflects a high degree of association, suggesting that changes in one variable are closely related to changes in the other, and a strong r-value indicates that improvements in metalinguistic skills, such as Syntactic Awareness, are likely to correspond to better reading comprehension outcomes. A Very strong correlation (0.80–1.00) indicates an extremely high degree of linear association. If an r-value approaches 1.00, it implies that the two variables move together almost perfectly. In educational research, such very strong correlations are rare and suggest that one variable is a major predictor of the other.

The sign of the r-value indicates the direction of the relationship. A positive r-value means that both variables increase or decrease together, while a negative r-value means that one variable increases while the other decreases. Statistical significance (p-value) must also be considered, since even a strong r-value is not meaningful if it is not statistically significant ($p > 0.05$). In the context of this study, this r-value interpretation allows the researcher to determine which aspects of metalinguistic awareness most strongly contribute to specific reading comprehension skills in deaf learners, guiding targeted instructional interventions under the SMARE framework.

To determine whether there is a significant relationship between the participants' demographic profile and their metalinguistic awareness after exposure to the SMARE Approach, the demographic variables considered, namely age group, grade level, preferred communication modality, and type of school placement, were each paired with metalinguistic awareness as the dependent variable, and a One-Way Analysis of Variance (ANOVA) was employed for each. The purpose of each analysis was to determine whether metalinguistic awareness significantly varies across different age groups of deaf learners, across grade levels

of deaf learners, according to the preferred communication modality of deaf learners, and based on the type of schools the learners have been enrolled, in every case after exposure to the SMARE Approach. The One-Way Analysis of Variance (ANOVA) was thus employed to examine variations in metalinguistic awareness when participants were grouped according to each demographic profile variable. The demographic variables were also described as including age, grade level, preferred communication modality, and years in SPED.

In the same manner, the relationship between the demographic profile and the reading comprehension performance of deaf learners after exposure to the SMARE Approach was examined. Age group, grade level, preferred communication modality, and type of school placement served as the demographic profile variables, reading comprehension performance served as the dependent variable, and One-Way Analysis of Variance (ANOVA) served as the statistical tool. The purpose of these analyses was to determine whether reading comprehension performance significantly varies across different age groups of deaf learners, across grade levels of deaf learners, according to preferred communication modality, and based on the type of school placement the learners have been, after exposure to the SMARE Approach. These analyses examined whether the reading comprehension performance of deaf learners significantly differs when grouped according to selected demographic profile variables, namely age group, grade level, preferred communication modality, and years in SPED. A One-Way Analysis of Variance (ANOVA) was employed for all variables, as the study aimed to determine whether there were statistically significant differences in mean reading comprehension scores among three or more independent groups following exposure to the SMARE Approach. This statistical technique is appropriate when comparing group means across categorical variables and assessing the influence of learner characteristics on academic performance outcomes. The use of One-Way ANOVA enabled the researcher to identify which demographic factors may contribute to variations in reading comprehension performance among deaf learners, thereby providing empirical basis for understanding learner diversity and informing instructional planning and intervention development under the SMARE Approach.

RESULTS AND DISCUSSION

This chapter presents and interprets the data gathered from 30 deaf learners who participated in the study, with the aim of determining their level of metalinguistic awareness, their level of reading comprehension performance after exposure to the SMARE Approach, and the relationship between the two variables. The study followed a descriptive-correlative research design. Frequency counts and percentages were used to describe the demographic profile of the participants. The mean and standard deviation were used to describe the levels of metalinguistic awareness and reading comprehension. The Pearson Product-Moment Correlation was used to test the relationship between metalinguistic awareness and reading comprehension. One-Way Analysis of Variance (ANOVA), Tukey HSD post hoc analysis, and independent-samples t-tests were used to examine differences according to the participants' profile, all at the 0.05 level of significance. Level classifications for the subscales followed the established rubrics used in the study. The discussion is grounded in the data gathered, and the results are interpreted in direct relation to the research objectives and in light of existing literature.

Demographic profile of the participants

The age distribution showed that most of the 30 deaf learners were aged 13 to 15 years (f = 12, 40.0%), followed by those aged 16 to 18 years (f = 10, 33.3%) and those aged 10 to 12 years (f = 8, 26.7%). This indicates that most participants were in early to middle adolescence,

a stage that is critical for language consolidation, metalinguistic awareness, and academic literacy development. Research indicates that deaf learners at intermediate and secondary levels often show wide variability in language proficiency because of differences in early language access and educational placement (Spencer & Marschark, 2010; Hall, Hallquist, & Stevenson, 2020). Age among deaf learners also does not always correspond to grade-level reading performance, since delayed early exposure to accessible language, particularly among children born to hearing parents, can shape literacy trajectories well into adolescence (Hall et al., 2020; Caselli & Pyers, 2020). In the Philippine context, age-grade heterogeneity is common in SPED centers and inclusive settings because of late school entry, grade retention, and transitions between self-contained and inclusive programs (Republic Act No. 11106, 2018; DepEd Order No. 21, s. 2019). The predominance of learners aged 13 to 15 years therefore suggests a developmental stage at which language and literacy interventions can yield substantial academic benefits.

In terms of grade level, the largest proportion of learners were in Grade 6 (n = 8, 26.7%), followed by Grade 8 (n = 7, 23.3%) and Grade 5 (n = 6, 20.0%). Fewer learners were enrolled in Grade 4 (n = 5, 16.7%) and Grade 7 (n = 4, 13.3%). Grade level was measured at the ordinal level and reflects hierarchical academic placement, which may influence metalinguistic awareness and reading comprehension. This pattern reflects a common trend in deaf education, where literacy challenges become more visible in the upper elementary and secondary levels as academic tasks shift from learning to read toward reading to learn. These tasks require higher-order comprehension, vocabulary depth, syntactic awareness, and metalinguistic competence (Spencer & Marschark, 2010; Lederberg, Miller, Easterbrooks, & Connor, 2021). Delays in early access to accessible language input contribute to reading achievement gaps that may become more pronounced during the middle school years (Hall, Hallquist, & Stevenson, 2020). Literacy development may also fail to match grade-level expectations in inclusive settings where instruction is delivered primarily through spoken or print-based English without consistent sign language mediation (Caselli & Pyers, 2020). The higher proportions in Grade 6 and Grade 8 may reflect transitional phases in the Philippine K-12 system, in which Grade 6 marks the end of elementary education and Grades 7 and 8 are the early years of junior high school. Research in inclusive contexts shows that such transitions often expose gaps in academic language proficiency among deaf learners, particularly in reading comprehension and written expression (Antia, Jones, Reed, & Kreimeyer, 2009; Lederberg et al., 2021). Multi-grade groupings in SPED centers and inclusive schools, which arise from enrollment size and resource allocation policies (Department of Education, 2019; Republic Act No. 11106, 2018), reinforce the need for structured literacy frameworks and visually accessible instruction. The participants are thus situated at critical stages of academic literacy development, where strengthening metalinguistic awareness is essential.

With regard to the primary language used, most learners reported Filipino Sign Language (FSL) as their primary mode of communication (n = 18, 60.0%), followed by Sign-Supported English (n = 10, 33.3%) and Home Signs (n = 2, 6.7%). The predominance of FSL aligns with the legal recognition of FSL as the national sign language of the Filipino Deaf community under Republic Act No. 11106 (2018), which mandates its promotion and institutional use in education, government services, and public communication. DepEd Order No. 21, s. 2019 further supports inclusive and accessible instruction for learners with disabilities. Contemporary research emphasizes that access to natural sign language supports cognitive development, academic engagement, and literacy acquisition (Hall, Hallquist, & Stevenson, 2020; Caselli & Pyers, 2020). Deaf learners who acquire a fully accessible first language, particularly a natural sign language, show stronger linguistic foundations that

contribute to metalinguistic awareness and reading comprehension development (Caselli & Pyers, 2020; Lederberg, Miller, Easterbrooks, & Connor, 2021). Natural sign languages possess complete grammatical systems that support syntactic awareness, narrative competence, and vocabulary depth. The 33.3% who used Sign-Supported English reflect the continued use of manually coded systems in inclusive and transitional settings. These systems follow English word order and facilitate access to print, but they are not fully natural languages and are most effective when used alongside a fully developed sign language (Hall et al., 2020; Lederberg et al., 2021). The 6.7% who used Home Signs are particularly noteworthy, because home sign systems tend to emerge when deaf children lack early exposure to formal sign language models, and limited early access to structured language input places children at risk for later literacy difficulties (Hall et al., 2020). Such learners may require intensified linguistic and metalinguistic support. Overall, the predominance of FSL suggests a relatively strong linguistic foundation for examining metalinguistic awareness in relation to reading comprehension, while the variability in language access points to the need for differentiated instruction.

For type of school placement, the participants were equally distributed between SPED Centers (n = 15, 50.0%) and Inclusive Schools (n = 15, 50.0%). Specialized programs may provide greater access to sign language models, visually accessible instructional strategies, and teachers trained in deaf education (Lederberg et al., 2021; Spencer & Marschark, 2010), and deaf learners benefit from peers and adults who share their primary mode of communication (Caselli & Pyers, 2020; Hall, Hallquist, & Stevenson, 2020). Inclusive placements align with global and national movements toward inclusive education, but their success depends on qualified interpreters, teacher competence in visual pedagogy, and structured language support (Antia, Jones, Reed, & Kreimeyer, 2009; Lederberg et al., 2021). Placement type by itself is not the sole determinant of achievement, since language accessibility and instructional quality are stronger predictors of literacy outcomes (Hall et al., 2020; Caselli & Pyers, 2020). The coexistence of SPED centers and inclusive schools reflects the dual service delivery approach of the Department of Education (Department of Education, 2019; Republic Act No. 11106, 2018), and the equal distribution strengthens the study's capacity to examine the variables across varied instructional environments.

Level of metalinguistic awareness

The level of morphological awareness was Moderate, with a mean of 6.10 (SD = 1.20), corresponding to the 41 to 60% range. The descriptive interpretation was that learners identify basic word parts but show partial or inconsistent understanding. Learners were generally able to identify basic morphemic units such as prefixes, suffixes, and root words, but their application of word formation rules remained partial or inconsistent. The standard deviation reflects moderate variability, with most participants clustering around the moderate level and few performing at higher or lower extremes. These findings are consistent with research showing that morphological awareness is a developing skill among deaf learners that plays a critical role in reading comprehension, particularly for those with limited access to spoken phonology (Caselli & Pyers, 2020; Hall, Hallquist, & Stevenson, 2020; Lederberg, Miller, Easterbrooks, & Connor, 2021). Morphological knowledge supports vocabulary growth, word recognition, and syntactic processing. Deaf learners also rely more heavily on visual and morphological cues when processing written language (Hall et al., 2020), which is why systematic and explicit instruction in morpheme recognition, word formation, and morphological analysis is recommended (Lederberg et al., 2021; Spencer & Marschark, 2010). The present results reinforce international evidence that morphological awareness is a foundational component of reading comprehension for deaf learners. Policy frameworks in the Philippines, namely Republic Act No. 11106 (2018) and DepEd Order No. 21, s. 2019, likewise

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emphasize accessible language and structured literacy instruction in SPED and inclusive settings, although local empirical research remains limited.

Syntactic awareness was also Moderate, with a mean of 5.50 (SD = 1.40) in the 41 to 60% range. The descriptive interpretation was that learners understand basic sentence structure but struggle with complex constructions. Learners generally understood simple subject-verb-object patterns but had difficulty with compound or subordinate clauses. The standard deviation of 1.40 reflects moderate variability, with some individuals showing slightly higher or lower syntactic competence. International research likewise shows that syntactic awareness in deaf learners develops progressively but may remain below that of hearing peers, particularly in linear, phonologically based languages such as English (Hall, Hallquist, & Stevenson, 2020; Spencer & Marschark, 2010). Syntactic competence is critical for reading comprehension because it enables learners to parse clause relationships, interpret grammatical markers, and integrate sentence-level meaning within discourse (Lederberg et al., 2021). Deaf learners often struggle to transfer knowledge from a visual-spatial sign language structure to the linear syntax of written English, so explicit instructional bridging is needed (Caselli & Pyers, 2020; Lederberg et al., 2021). The moderate level observed here therefore supports structured strategies such as visual mapping of sentence structures, guided analysis of complex clauses, and intentional use of FSL as a bridge to English syntax, in line with the policy frameworks of Republic Act No. 11106 (2018) and DepEd Order No. 21, s. 2019.

Semantic awareness was likewise Moderate, with a mean of 4.80 in the 41 to 60% range. The standard deviation was reported as 1.40 in the table and as 1.30 in the accompanying text, and both values are retained as originally reported. The descriptive interpretation provided was that learners identify basic word parts but show partial or inconsistent understanding. In the narrative, learners generally understood literal word meanings but had difficulty with nuanced, figurative, or context-dependent meanings, and the standard deviation indicated moderate variability reflecting differences in language exposure, vocabulary development, and educational experience. This is consistent with research indicating that semantic awareness develops slowly among deaf learners because of differences in early language access and reduced incidental vocabulary exposure (Hall, Hallquist, & Stevenson, 2020), and progress may be slower when instruction does not explicitly address multiple word meanings, contextual inference, and figurative language. Vocabulary knowledge and depth of semantic representation are strong predictors of reading comprehension among deaf learners (Lederberg et al., 2021), and consistent use of natural sign language as an instructional foundation supports conceptual development that transfers to written comprehension (Caselli & Pyers, 2020). Semantic awareness is therefore developing but not yet fully consolidated, which underscores the value of explicit vocabulary instruction, contextualized reading activities, and guided interpretation of nuanced meanings, consistent with Republic Act No. 11106 (2018) and DepEd Order No. 21, s. 2019.

Level of reading comprehension after exposure to the SMARE Approach

Literal comprehension was Moderate, with a mean of 6.00 (SD = 0.67) in the 41 to 60% range. The descriptive interpretation reported was that learners identify basic word parts but show partial or inconsistent understanding. Participants were generally able to identify explicitly stated information such as facts and main ideas, but their understanding remained partial or inconsistent, with occasional missed details or difficulty retrieving information accurately. This suggests that the SMARE (Strategic Metalinguistic Awareness and Reading Enhancement) Approach may support basic literal comprehension, although reinforcement is

still needed. The result aligns with research indicating that deaf learners develop foundational comprehension skills first, particularly when instruction emphasizes explicit, structured strategies for vocabulary, sentence-level understanding, and text organization (Lederberg, Miller, Easterbrooks, & Connor, 2021; Spencer & Marschark, 2010). Explicit and visually accessible instruction helps learners identify key information, understand sentence relationships, and recognize morphological structures (Caselli & Pyers, 2020; Hall, Hallquist, & Stevenson, 2020). Because many deaf learners have reduced incidental exposure to spoken language, structured metalinguistic strategies are essential for building the surface-level comprehension that underlies higher-order processing. Policy frameworks under Republic Act No. 11106 (2018) and DepEd Order No. 21, s. 2019 support integrating sign language with print-based instruction. Continued structured practice and scaffolded reading interventions remain necessary.

Inferential understanding was also Moderate, with a mean of 5.10 (SD = 0.57) in the 41 to 60% range, and the same descriptive interpretation as above was reported. Learners could make basic inferences, such as identifying cause-effect relationships or drawing simple conclusions, but struggled with deeper interpretations that require connecting multiple ideas or evaluating implicit meaning. This aligns with research attributing moderate inferential comprehension to limited early access to linguistic structures and reduced exposure to syntactic and semantic cues (Hall, Hall, & Caselli, 2020; Spencer & Marschark, 2021). Inferential comprehension requires higher-order processing that depends on word recognition, literal understanding, metalinguistic awareness, and vocabulary depth (Trussell & Easterbrooks, 2021; Swanwick & Marschark, 2022). Philippine studies report similar patterns. Flores and Reyes (2020) observed that learners in SPED centers and inclusive classrooms could grasp straightforward inferences but had difficulty with subtler, context-dependent interpretations, and Lutalo (2022) emphasized that interventions integrating FSL and scaffolded comprehension strategies improve interpretation beyond the literal level. The SMARE Approach thus appears to support basic inferential skills, while additional instruction in reasoning, prediction, and textual analysis is needed for higher-order comprehension.

Sequencing and summarizing was Moderate as well, with a mean of 4.50 (SD = 0.53) in the 41 to 60% range. The descriptive interpretation was that learners partially sequence events and provide an incomplete or unclear summary. Learners could partially sequence events and identify some key ideas, but their summaries tended to be incomplete, lacking in coherence, or missing important details. The relatively low standard deviation shows that performances were closely clustered around the mean, reflecting consistent but developing competence. These skills require understanding temporal relationships, identifying main ideas, and integrating information across sentences and paragraphs, and deaf learners often show variability in them because of differences in syntactic competence, vocabulary depth, and early language access (Lederberg et al., 2021; Hall, Hallquist, & Stevenson, 2020). Limited early access to a fully accessible language has been associated with later challenges in narrative organization and text integration (Hall et al., 2020). Visual organizers, story mapping, guided identification of key events, and scaffolded summarization have been shown to improve comprehension monitoring and discourse coherence (Lederberg et al., 2021), consistent with Republic Act No. 11106 (2018) and DepEd Order No. 21, s. 2019. The moderate level observed suggests that the SMARE Approach supports developing sequencing skills, although explicit modeling, structured discourse mapping, and scaffolded summarization practice remain necessary.

Relationship between metalinguistic awareness and reading comprehension

A Pearson Product-Moment Correlation was conducted at the 0.05 level of significance to determine the relationship between learners' metalinguistic awareness and reading comprehension after exposure to the SMARE Approach. The analysis revealed a weak positive correlation, $r = .288$, $p = .490$ (2-tailed), with $N = 8$. Although the coefficient indicates that higher metalinguistic awareness tends to correspond with higher reading comprehension, the relationship was not statistically significant ($p > .05$), so the null hypothesis was not rejected. The weak magnitude may be influenced by the small sample size ($N = 8$), which reduces statistical power and yields unstable correlation estimates and non-significant p-values despite observable trends (Field, 2020). The positive direction is consistent with research showing that vocabulary knowledge, morphological processing, and syntactic competence contribute to literacy outcomes in deaf and hard-of-hearing students (Lederberg, Miller, Easterbrooks, & Connor, 2021), and that variability in early language access influences later reading performance (Hall, Hallquist, & Stevenson, 2020). The strength of the relationship may vary with instructional exposure, learner heterogeneity, and contextual factors. Republic Act No. 11106 (2018) and DepEd Order No. 21, s. 2019 support the theoretical expectation that strengthening metalinguistic awareness should positively influence reading comprehension. These findings suggest that the SMARE Approach may contribute to improvements in both variables, but the statistical relationship was not significant in this sample. A larger sample, an extended intervention duration, more intensive and sustained metalinguistic scaffolding, and longitudinal tracking would help capture delayed or cumulative effects.

Components of metalinguistic awareness associated with reading comprehension

The analysis, based on Pearson product-moment correlation at the .05 level of significance, showed that none of the individual components significantly predicted reading comprehension. Morphological awareness showed no significant correlation with reading comprehension ($p > .05$), with weak and non-significant predictive strength, and was not a significant predictor, indicating that awareness of word structure alone did not significantly explain variations in comprehension. Syntactic awareness likewise showed no significant correlation ($p > .05$), with weak and non-significant strength, and knowledge of sentence structure did not independently predict comprehension outcomes. Semantic awareness also showed no significant correlation ($p > .05$), with weak and non-significant strength, and understanding of word meaning in context was insufficient to predict comprehension performance. Overall metalinguistic awareness showed a positive but non-significant association with reading comprehension ($r = .288$, $p = .490$), and was likewise not a significant predictor. These results are consistent with literature emphasizing that reading comprehension among deaf and hard-of-hearing learners is multifactorial, shaped by linguistic knowledge, cognitive processing, background knowledge, instructional quality, and language access rather than by isolated metalinguistic components (Marschark & Knoors, 2020; Lederberg et al., 2021). Morphological and syntactic awareness contribute to word recognition and sentence-level processing but do not always independently predict comprehension when inference generation and discourse integration are required (Lederberg et al., 2021). Vocabulary and semantic knowledge influence comprehension through indirect pathways such as background knowledge activation and discourse-level understanding (Marschark & Knoors, 2020), which may explain the absence of predictive power for semantic awareness among learners with heterogeneous language histories. Gains in metalinguistic awareness may also precede measurable comprehension gains, requiring sustained reinforcement (Lederberg et al., 2021), and small samples may lack the power to detect predictive relationships (Field, 2018). Explicit

instruction in morphological, syntactic, and semantic awareness therefore remains pedagogically valuable, but these components appear to function as foundational supports within a broader framework of sustained, integrated, and meaning-focused instruction (Marschark & Knoors, 2020; Lederberg et al., 2021).

Differences in metalinguistic awareness according to learner profile

One-Way ANOVA was conducted at the 0.05 level of significance to examine differences in overall metalinguistic awareness according to age, grade level, primary language used, and type of school placement.

By age, there was no statistically significant difference, $F(2, 27) = 0.89$, $p = .421$ (between groups SS = 2.84, df = 2, MS = 1.42; within groups SS = 43.05, df = 27, MS = 1.59; total SS = 45.89, df = 29). Since p was greater than .05, the null hypothesis was not rejected, indicating that the SMARE Approach appears to benefit learners similarly across the 10 to 12, 13 to 15, and 16 to 18 age groups. This agrees with Hall, Levin, and Anderson (2021), who argue that early and sustained access to an accessible natural language, rather than age alone, accounts for differences in later language proficiency. Marschark and Knoors (2020) similarly report that language proficiency, educational experience, and instructional quality shape metalinguistic development more strongly than chronological age, and Lederberg, Miller, Easterbrooks, and Connor (2021) note that structured interventions can reduce variability traditionally attributed to age.

By grade level, there was no significant difference, $F(4, 25) = 1.32$, $p = .287$ (between groups SS = 6.72, df = 4, MS = 1.68; within groups SS = 39.17, df = 25, MS = 1.57; total SS = 45.89, df = 29). The null hypothesis was not rejected, and the effect of the SMARE Approach on metalinguistic awareness appears consistent across Grades 4 to 8. This aligns with evidence that learners with similar exposure to accessible language such as FSL, combined with structured literacy instruction, show comparable metalinguistic awareness regardless of grade (Hall, Levin, & Anderson, 2021; Lederberg et al., 2021; Marschark & Knoors, 2020). Interventions such as SMARE should therefore prioritize targeted instruction and scaffolded practice rather than rely on grade-level placement.

By primary language used, a statistically significant difference was found, $F(2, 27) = 3.41$, $p = .048$ (between groups SS = 9.85, df = 2, MS = 4.93; within groups SS = 36.04, df = 27, MS = 1.33; total SS = 45.89, df = 29). Since p was less than .05, the null hypothesis was rejected, indicating that primary language modality (FSL, Sign-Supported English, or Other) influences metalinguistic awareness after exposure to the SMARE Approach. Tukey HSD post hoc analysis revealed that learners who primarily use FSL obtained significantly higher mean scores than those using other communication modalities. Pairwise independent-samples t-tests showed that the difference between FSL and Sign-Supported English was not significant, $t(26) = 2.01$, $p = .054$, although FSL users obtained higher mean scores. The difference between FSL and Other was significant, $t(18) = 2.47$, $p = .024$, indicating significantly higher metalinguistic awareness among FSL users. The difference between Sign-Supported English and Other was not significant, $t(10) = 1.18$, $p = .264$. The original analysis also noted a large effect size, although no effect size value was reported for this comparison. This pattern is supported by Hall, Levin, and Anderson (2021), who found that early and consistent access to a natural sign language supports morphological, syntactic, and semantic awareness. It is also supported by Lederberg et al. (2021), who highlight higher metalinguistic competence among learners with structured instruction in a fully accessible first language, and by Marschark and Knoors (2020), who report stronger metalinguistic and literacy outcomes for users of natural sign languages than for users of manually coded systems or home signs. Learners whose primary language is FSL may acquire metalinguistic skills more efficiently through consistent exposure to a

complete grammatical system, whereas users of Sign-Supported English or home signs may need additional scaffolding. This supports the theoretical assumption of the SMARE Framework that strong first-language access enhances structural language processing.

By type of school placement, there was no significant difference between SPED Centers and Inclusive Schools, $F(1, 28) = 0.79$, $p = .381$ (between groups SS = 1.26, df = 1, MS = 1.26; within groups SS = 44.63, df = 28, MS = 1.59; total SS = 45.89, df = 29). The null hypothesis was not rejected, suggesting that the effectiveness of the SMARE Approach does not vary significantly with placement type. This accords with research showing that language accessibility and instructional quality outweigh placement, and that deaf learners can achieve comparable outcomes in self-contained and inclusive settings when they have consistent exposure to a fully accessible language and structured, visually supported instruction (Hall, Levin, & Anderson, 2021; Lederberg et al., 2021).

In summary, primary language used was the only profile variable with a significant effect on metalinguistic awareness, while age, grade level, and school placement were not significant. This highlights the importance of linguistic foundation and supports the assumption of the Strategic Metalinguistic Framework (SMARE) that language access and modality influence cognitive-linguistic processing.

Differences in reading comprehension according to learner profile

One-Way ANOVA was likewise employed at $\alpha = .05$ to examine differences in overall reading comprehension ($M = 5.20$, $SD = 0.59$) according to the same profile variables.

By age, there was no significant difference, $F(2, 27) = 0.54$, $p = .589$ (between groups SS = 0.38, df = 2, MS = 0.19; within groups SS = 9.52, df = 27, MS = 0.35; total SS = 9.90, df = 29), indicating that the SMARE Approach appears to support reading comprehension similarly across age groups. By grade level, there was no significant difference, $F(4, 25) = 0.67$, $p = .617$ (between groups SS = 0.92, df = 4, MS = 0.23; within groups SS = 8.98, df = 25, MS = 0.36; total SS = 9.90, df = 29). Reading comprehension among deaf learners is largely influenced by language accessibility, early language exposure, and instructional quality rather than by age or grade, so structured, scaffolded, and visually accessible instruction can minimize age- and grade-related differences. By school placement, there was no significant difference, $F(1, 28) = 0.61$, $p = .441$ (between groups SS = 0.21, df = 1, MS = 0.21; within groups SS = 9.69, df = 28, MS = 0.35; total SS = 9.90, df = 29). Marschark and Knoors (2020) explain that outcomes are shaped more by the quality of language input, teacher expertise, and accessibility of instruction than by inclusive or specialized setting. Mayer and Trezek (2020) report wide variation in comprehension within both settings, identifying effective literacy instruction as the key predictor, and Lederberg et al. (2021) emphasize that structured, explicit literacy instruction benefits deaf learners across contexts.

By primary language used, the overall difference was not significant at the .05 level, $F(2, 27) = 3.12$, $p = .059$ (between groups SS = 1.78, df = 2, MS = 0.89; within groups SS = 8.12, df = 27, MS = 0.30; total SS = 9.90, df = 29), although the result approached significance and the null hypothesis was not rejected. FSL users may have slightly higher scores, but not strongly enough to establish significance. Pairwise t-tests showed no significant difference between FSL and Sign-Supported English, $t(26) = 1.88$, $p = .071$, although FSL users had higher mean scores. FSL users performed significantly better than learners using other modalities, $t(18) = 2.14$, $p = .046$, and there was no significant difference between Sign-Supported English and Other, $t(10) = 1.02$, $p = .331$. The effect size for FSL versus Sign-Supported English was computed as Cohen's $d = (5.38 - 4.98) / 0.57 \approx 0.70$, a medium to large

effect suggesting a practically meaningful difference even though statistical significance was marginal. Hall, Levin, and Anderson (2021) explain that early access to a complete natural language is foundational to later academic and literacy outcomes, and that language deprivation affects later linguistic and academic outcomes. Lederberg et al. (2021) link literacy achievement to language competence and structured instruction grounded in an accessible linguistic system. Mayer and Trezek (2020) note that proficiency in a natural sign language supports cross-linguistic transfer to written language through vocabulary knowledge, syntactic awareness, and comprehension monitoring, which may explain why FSL users outperformed the Other group. The non-significant difference between FSL and Sign-Supported English suggests that learners using Sign-Supported English may still benefit from structured, visually accessible instruction, and the trend ($p = .071$) may reach significance with a larger sample. The results support the premise of the SMARE Approach that strengthening metalinguistic awareness within an accessible first-language framework can contribute to improved literacy outcomes.

Overall, age ($F = 0.54$, $p = .589$), grade level ($F = 0.67$, $p = .617$), primary language used ($F = 3.12$, $p = .059$), and school placement ($F = 0.61$, $p = .441$) did not significantly influence overall reading comprehension, although primary language approached significance. These findings agree with Hall, Hallquist, and Stevenson (2020), Marschark and Knoors (2020), Mayer and Trezek (2020), and Lederberg et al. (2021), who identify language exposure, instructional quality, and structured metalinguistic support rather than demographic variables as primary drivers of literacy. Primary language may influence literacy development but is not a sole determinant, since comprehension depends on interacting variables including vocabulary knowledge, working memory, and instructional quality (Marschark & Knoors, 2020; Spencer & Marschark, 2021).

Synthesis of findings

Taken together, the data from the 30 deaf learners show that metalinguistic awareness was Moderate in morphological ($M = 6.10$, $SD = 1.20$), syntactic ($M = 5.50$, $SD = 1.40$), and semantic ($M = 4.80$) domains. Reading comprehension after exposure to the SMARE Approach was also Moderate in literal comprehension ($M = 6.00$, $SD = 0.67$), inferential understanding ($M = 5.10$, $SD = 0.57$), and sequencing and summarizing ($M = 4.50$, $SD = 0.53$). The correlation between overall metalinguistic awareness and reading comprehension was positive but weak and non-significant ($r = .288$, $p = .490$, $N = 8$), and none of the components significantly predicted comprehension. Among the profile variables, only primary language used significantly differentiated metalinguistic awareness ($F(2, 27) = 3.41$, $p = .048$), with FSL users outperforming those using other modalities, and FSL users also showed significantly higher reading comprehension than the Other group ($t(18) = 2.14$, $p = .046$). These findings address the research objectives by describing the learners' levels of metalinguistic awareness and reading comprehension, testing their relationship, and identifying the profile characteristics that matter. They contribute to the field by underscoring that accessible first-language foundations, explicit metalinguistic instruction, and structured literacy support, rather than age, grade, or placement alone, are central to deaf learners' literacy development. The next chapter draws conclusions and recommendations from these findings, including implications for instruction, policy, and future research with larger samples and longer interventions.

CONCLUSION

This study examined the relationship between metalinguistic awareness and reading comprehension performance among deaf learners after exposure to the Strategic Metalinguistic

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Approach in Reading Enhancement (SMARE). Using a quantitative, descriptive-correlational design, it profiled 30 deaf learners from SPED and inclusive settings within the Division of Butuan City, assessed their morphological, syntactic, and semantic awareness, evaluated their literal comprehension, inferential understanding, and sequencing and summarizing skills, and tested the relationships among these variables. The participants were enrolled in Grades 4 to 8, with the largest groups in Grade 6 (8 learners) and Grade 8 (7 learners), followed by Grade 5 (6 learners), Grade 4 (5 learners), and Grade 7 (4 learners). Their ages revealed an age-grade mismatch, which is common among learners with hearing impairment because of delayed school entry, language deprivation, or prolonged stay in SPED programs. Most used Filipino Sign Language (18 learners), followed by Sign-Supported English (10 learners) and Home Signs (2 learners), and the sample was evenly divided between SPED Centers (15 learners) and Inclusive Schools (15 learners). Taken together, these characteristics portray a heterogeneous population for whom visually accessible instruction is essential to literacy development.

Regarding metalinguistic awareness, the learners demonstrated moderate levels of morphological and syntactic awareness, and a moderate to relatively higher level of semantic awareness. They could recognize and manipulate prefixes, suffixes, and root words to a functional extent, and they showed developing ability in identifying correct sentence structures and grammatical relationships. Nevertheless, difficulties persisted in complex morphological constructions and in complex and compound sentences, which may be influenced by differences between sign language structure and written English syntax. Learners generally understood word meanings, contextual clues, and basic vocabulary relationships, suggesting that the structured reading activities of the SMARE Approach supported meaning-making, although further enrichment is needed to deepen higher-level vocabulary and conceptual understanding. In the same manner, reading comprehension performance was moderate to satisfactory for literal comprehension, moderate but slightly lower for inferential understanding, and moderate for sequencing and summarizing. Learners could identify explicitly stated details, facts, and main ideas, and could make simple inferences, yet they struggled to interpret implied meanings and connect ideas beyond the text. They could also arrange events logically and identify key ideas, although some had difficulty condensing information and maintaining coherence. These patterns indicate that the SMARE Approach effectively supported surface-level understanding and the organization of textual information, while higher-order comprehension still requires continued scaffolding and explicit metalinguistic instruction.

Despite these gains in metalinguistic awareness, the improvements did not translate into proportional gains in reading comprehension. Statistical analysis showed no significant relationship between overall metalinguistic awareness and overall reading comprehension performance, and none of the morphological, syntactic, or semantic components correlated significantly with the comprehension subskills. Regression analysis likewise showed that none of the three components significantly predicted reading comprehension, as all predictors yielded non-significant p-values and weak predictive strength. It follows that metalinguistic awareness alone is insufficient as a standalone predictor of reading comprehension, and that other factors such as language exposure, instructional modality, and cognitive processing likely contribute. Reading comprehension among deaf learners is therefore multifactorial and cannot be fully explained by metalinguistic awareness alone. This finding calls for some caution in interpreting the claim that learners' reading outcomes are closely linked to their level of language awareness, since the statistical evidence did not establish such a link. The more defensible conclusion is that the SMARE Approach positively influenced the levels of metalinguistic awareness and reading comprehension, particularly in structural language

knowledge and literal comprehension, and that it serves as an effective framework for developing foundational language awareness, with complementary strategies needed to strengthen higher-order comprehension and meaning-making.

The analyses of the participants' profile further showed that age, grade level, primary language used, and type of school placement were not significantly related to either metalinguistic awareness or reading comprehension performance, as all computed p-values exceeded the 0.05 level of significance. Differences in morphological, syntactic, and semantic awareness, as well as in literal comprehension, inferential understanding, and sequencing and summarizing, were therefore not influenced by demographic characteristics. This suggests that the benefits of the SMARE Approach were consistent across age groups, grade levels, language backgrounds, and educational placements, and may be attributed to the structured and visually supported features of the intervention itself. On this basis, the approach may be regarded as a responsive and inclusive instructional framework that supports literacy growth across diverse learner profiles. The study thus contributes meaningful evidence for integrating metalinguistic-focused strategies in deaf education through structured and visually accessible language instruction, and it strengthens the case for institutionalizing SMARE-based instructional materials to promote equitable and sustainable literacy advancement.

In light of these conclusions, several recommendations follow. The SMARE-based instructional material developed from this study should be formally adopted in SPED programs serving deaf learners, and teachers should sustain its implementation while placing greater emphasis on semantic awareness and higher-order comprehension skills such as inferencing, sequencing, and summarizing. Instruction should pair explicit comprehension strategy teaching with structured metalinguistic activities, supported by visual scaffolds, sign-supported explanations, and guided practice, to enhance the transfer of language awareness to reading comprehension. School administrators may institutionalize such frameworks through curriculum support, instructional supervision, and sustained program implementation, and schools should prioritize professional development and resource allocation that integrate language awareness and reading comprehension instruction to ensure long-term, consistent intervention. Finally, future studies should employ larger samples and more rigorous designs, such as experimental or longitudinal approaches, to strengthen evidence on the causal and predictive relationships between metalinguistic awareness and reading comprehension, and should examine mediating variables such as vocabulary development, sign language proficiency, and working memory to clarify how metalinguistic awareness influences higher-order reading comprehension over time.

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