Exploring the Development of Pragmatic Assessments in Autism Spectrum Disorder: A Systematic Literature Review

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Abstract

Assessment for children with Autism Spectrum Disorder (ASD) has undergone significant development over the past decades. This study systematically reviews pragmatic assessment instruments used in clinical contexts for children with ASD. From an initial pool of 210 articles identified through academic database searches, a stepwise screening process (identification, abstract/title screening, and eligibility review) resulted in 21 eligible articles for full analysis. From these articles, 26 pragmatic assessment instruments were identified and systematically coded based on method of administration, target age group, assessed pragmatic features, and year of publication. The review reveals notable advancements, such as the adoption of video-based stimuli, inclusion of nonverbal elements, and use of multimodal approaches. However, several critical limitations remain, particularly the reliance on indirect parent or teacher reports (54%), which may overlook the dynamic aspects of social interaction. Most tools emphasize basic communicative functions (e.g., requesting, responding), with only 38% evaluating paralinguistic elements such as intonation and facial expressions. Moreover, approximately 80% of the instruments are designed for children under 12, leaving adolescents—who face increasingly complex pragmatic demands, including digital communication—underrepresented. Additionally, 88% of instruments were developed within Western cultural frameworks, raising concerns about cross-cultural validity in high-context cultures such as Indonesia. Two underserved groups also emerged: nonverbal children with ASD and adolescents primarily engaged in digital interaction. These findings suggest an urgent need for more inclusive, developmentally appropriate, and culturally responsive pragmatic assessment tools that can accommodate diverse communication styles and sociocultural contexts to ensure accurate and meaningful clinical evaluations.

Keywords: Autism spectrum disorder, pragmatic assessment instruments, pragmatic disorder

1. Introduction

The ability to communicate effectively depends not only on mastery of language structure but also on the ability to use language in appropriate social contexts, known as pragmatic skills. These skills include understanding nonverbal cues, taking conversational turns, adapting speaking style to interlocutors, and interpreting implicit meanings in conversations. Pragmatic competence is fundamental for building social relationships, participating in education, and engaging in daily life activities (Burgoon et al., 2021).

In individuals with Autism Spectrum Disorder (ASD), pragmatic competence is often an area of significant impairment and is among the most consistent features of the condition. Although many individuals with ASD may demonstrate relatively intact syntactic and semantic abilities, difficulties in using language contextually often become major barriers to social interaction (Reindal et al., 2023). These challenges may manifest in difficulties maintaining conversational topics, interpreting figurative language, or recognizing nonverbal cues. As a result, individuals with ASD frequently encounter problems forming friendships, sustaining conversations, and navigating implicit communication norms. Such difficulties may negatively affect their mental health (e.g., anxiety, depression, stress) and are often accompanied by co-occurring neurodevelopmental conditions such as ADHD (Kiogora, 2025). Consequently, these combined challenges contribute to lower academic achievement, reduced performance, and diminished quality of life.

These concerns are increasingly significant given the rising prevalence of ASD worldwide. Recent studies report that one in every 100 children globally is on the autism spectrum. In the United States, the CDC's Autism and Developmental Disabilities Monitoring (ADDM) Network estimated that 3.2% of eight-year-old children are diagnosed with ASD. In Indonesia, Deputy Minister of Health Dr. Dante Saksono Harbuwono reported an estimated 2.4 million children with ASD (Solmi et al., 2022; Issac et al., 2025).

As the number of individuals with ASD continues to rise, awareness of the importance of early intervention has also grown. Reliable and valid pragmatic assessment instruments are essential not only for accurate diagnosis but also for guiding intervention planning and evaluating therapeutic outcomes (Durosini & Aschieri, 2021). However, despite the increasing demand, few pragmatic assessment instruments have been developed in Indonesia (Satria, 2024). Professionals largely rely on foreign instruments designed within Western cultural frameworks, even though research indicates that cultural and contextual differences strongly influence the validity of pragmatic assessments (Ilmi & Degaf, 2024; Muniroh & Heydon, 2024).

Previous reviews have examined pragmatic assessment more broadly across clinical populations. For instance, Alduais et al. (2022) reviewed a wide range of instruments including the Discourse Comprehension Test (DCT), the Pragmatic Protocol, the Profile of Communicative Appropriateness, the Assessment Protocol of Pragmatic-Linguistic Skills, and the Communicative Abilities in Daily Living (CADL). While informative, their review was not specific to ASD but rather encompassed diverse populations such as individuals with hearing impairments or general developmental disorders. To date, there is limited scholarship focusing specifically on pragmatic assessment in individuals with ASD.

Building on these gaps, the present study aims to conduct a systematic literature review on the development of pragmatic assessment instruments specifically for individuals with ASD. The primary focus is on identifying instrument characteristics, assessment approaches, and emerging challenges and opportunities. The findings are expected to guide the development of culturally adapted and contextually relevant instruments, particularly for clinical and educational use in Indonesia, where cultural communication norms differ substantially from Western contexts.

2. Methods

This study employed a qualitative approach using the Systematic Literature Review (SLR) method. The procedure followed the model proposed by Grant and Booth, which consists of six main stages: (1) identifying research questions; (2) determining search keywords; (3) selecting journal articles; (4) classifying inclusion and exclusion criteria; (5) data extraction and coding; and (6) thematic analysis and synthesis of results. This structured process was chosen because it allows for a comprehensive understanding of existing pragmatic assessment instruments used with individuals diagnosed with Autism Spectrum Disorder (ASD) (Booth et al., 2021).

At the initial stage, the research questions were formulated to examine the development trends of pragmatic assessment instruments for children with ASD. The questions specifically focused on the types of instruments available, the pragmatic aspects they assess, and the characteristics of the study participants.

To identify relevant studies, searches were conducted using three databases: Connected Papers, Google Scholar, and Publish or Perish. Connected Papers was used to identify literature clusters and conceptual relationships between studies; Google Scholar was selected for its broad coverage of multidisciplinary publications; and Publish or Perish was employed for citation-based filtering to identify influential works. Keywords included "pragmatic assessment," "autism spectrum disorder," "pragmatic disorder," and "pragmatic instrument assessment." The search was carried out in three stages: (i) initial identification using keywords, (ii) screening based on titles and abstracts, and (iii) eligibility assessment through full-text review.

Articles were then classified based on inclusion and exclusion criteria to ensure focus and relevance. The criteria are summarized in Table 1.

Table 1: Inclusion and Exclusion Criteria

Criteria	Inclusion	Exclusion
Language Domain	Instruments explicitly assessing pragmatic aspects	Instruments assessing only phonology, morphology, syntax, or semantics
Assessment Purpose	Instruments designed for use in clinical or diagnostic contexts	Instruments intended solely for non-clinical or academic purposes
Population/Subjects	Instruments designed for children with Autism Spectrum Disorder (ASD)	Instruments targeting other populations with different disorders
Language of Article	Articles written in English or Indonesian	Articles written in languages other than English or Indonesian

Following this process, articles meeting the inclusion criteria were subjected to data extraction and coding. Key information collected included the instrument name, year of publication, method of administration (e.g., questionnaire, checklist, structured test, or observational protocol), pragmatic aspects measured (e.g., turn-taking, inference, contextual adaptation), and participant characteristics (age group, diagnosis, intervention setting). The extracted information was systematically coded into categories to facilitate thematic analysis.

The final stage involved thematic analysis and synthesis (Naeem et al., 2023). Data were organized into themes such as instrument type, developmental focus, assessed pragmatic features, and clinical applicability. This process

provided a synthesized understanding of current trends, research gaps, and opportunities for improving pragmatic assessment instruments for individuals with ASD.

3. Results And Discussion

Initial search across academic databases yielded 210 articles relevant to the topic of pragmatic assessment. After applying predefined inclusion and exclusion criteria, 17 articles were excluded, 15 of which examined non-clinical pragmatic assessments (e.g., for second language learners), and 2 were published in languages other than English (Spanish and Greek). The remaining 193 articles underwent title and abstract screening, resulting in the exclusion of an additional 170 articles that did not focus on clinical assessment for Autism Spectrum Disorder (ASD), such as studies focused on populations with aphasia. This process narrowed the selection to 23 articles specifically addressing pragmatic assessment in children with ASD. Of these, 21 full-text articles were successfully retrieved, while 2 could not be accessed due to paywall restrictions. The eligible articles were then thoroughly reviewed and organized using a reference management system. From these sources, pragmatic assessment instruments targeting ASD were extracted, catalogued chronologically, and systematically coded. Key information such as instrument name, year of publication, method of administration, and linguistic-pragmatic features assessed was tabulated to support further thematic analysis and synthesis.

Following the data collection process, a total of 21 journal articles were successfully reviewed, from which 26 distinct pragmatic assessment instruments were identified. Each of these instruments was specifically designed or applied to assess pragmatic language abilities in individuals with Autism Spectrum Disorder (ASD). The instruments varied in terms of their methodological approaches, target age groups, modes of administration (e.g., questionnaire, checklist, structured test, or observational protocol), and the specific aspects of pragmatics they aimed to evaluate such as verbal and non-verbal communication, discourse management, inferencing, and social appropriateness. The identification and classification of these tools provide a comprehensive overview of the current trends in pragmatic assessment practices within clinical contexts for the ASD population, serving as a critical foundation for further thematic analysis and synthesis.

The development of pragmatic assessment tools for children with Autism Spectrum Disorder (ASD) has undergone significant transformation over the past few decades, reflecting a growing awareness of the complex nature of social communication impairments within this population. Early instruments were primarily grounded in classical linguistic frameworks, such as Tough's and Halliday's Functions of Language, which emphasized basic communicative functions such as requesting, labelling, or informing as the foundation of pragmatic development. These assessments typically took the form of checklists or questionnaires completed by teachers, caregivers, or therapists, offering a practical yet indirect perspective on a child's language use in daily contexts. While such tools served as valuable starting points, they were limited in their ability to capture the nuanced, moment-to-moment features of pragmatic behavior, particularly those relevant to children with ASD, whose communicative challenges often extend beyond surface-level language functions.

In response to these limitations, subsequent decades have witnessed the emergence of more sophisticated tools designed to assess multiple dimensions of pragmatic competence. Instruments such as the Putting Pragmatic Protocol and the Profile of Communicative Appropriateness began to incorporate assessments of nonverbal cues, paralinguistic features (e.g., tone, prosody), and sociolinguistic awareness features that are especially relevant in ASD, where challenges in interpreting or producing such cues are commonly observed. Technological advancements have further influenced the evolution of pragmatic assessment. Tools like the Clinical Assessment of Pragmatics (CAPs) and the Assessment Battery for Communication (ABaCo) employ video-based stimuli to present structured yet ecologically valid scenarios, allowing clinicians to evaluate both expressive and receptive pragmatic abilities within semi naturalistic contexts. Moreover, there has been an expansion in the age range targeted by these assessments. Earlier instruments focused predominantly on early childhood, but newer tools now include adolescents and, to a lesser extent, young adults, acknowledging that pragmatic demands evolve with age and social context.

However, despite these advances, a comprehensive analysis of 26 pragmatic assessment tools for children with ASD reveals several persistent gaps and limitations that must be addressed to improve their clinical and cultural applicability. First, more than half (54%) of the reviewed instruments continue to rely heavily on third-party reporting, typically by parents, teachers, or therapists as seen in widely used tools like the Children's Communication Checklist-2 (CCC-2) and the Test of Pragmatic Skills (TPS). While practical in clinical and educational settings, these indirect assessments are inherently limited, as they may fail to capture subtle, dynamic aspects of pragmatic behaviour that are best observed through direct, real-time interactions. Second, the scope of pragmatic features assessed remains relatively narrow. Although 92% of the tools assess foundational pragmatic functions, such as turn-taking, requesting, and greeting, only 38% evaluate paralinguistic or nonverbal behaviours such as facial expressions, gesture, or intonation, which are crucial components of effective social communication and often impaired in individuals with ASD.
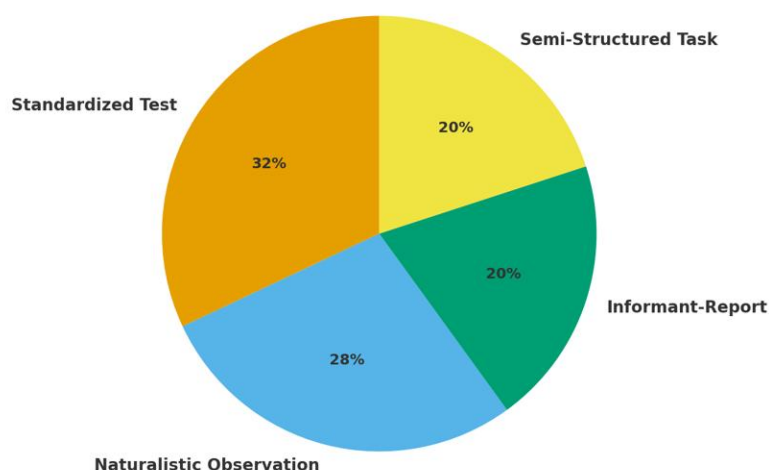
Figure 1: Distribution of methods in pragmatic assessment instruments for children with Autism Spectrum Disorder (ASD).

The figure illustrates the proportion of administration methods identified across 26 pragmatic assessment instruments reviewed from 21 eligible studies. Standardized tests account for the largest share (32%), followed by naturalistic observation (28%), informant-report methods such as parent or teacher checklists (20%), and semi-structured tasks (20%). These findings indicate a predominant reliance on structured and indirect approaches, while more dynamic and ecologically valid methods such as naturalistic observation remain less common.

A third issue pertains to developmental coverage. Approximately 80% of the instruments target children under the age of 12, leaving a noticeable gap in available tools for adolescents, a group for whom pragmatic demands become increasingly complex. During adolescence, social interactions become more abstract, subtle, and heavily influenced by peer dynamics, identity formation, and even digital communication platforms, all of which require higher-level pragmatic competencies. Yet, very few tools adequately assess pragmatic functioning in these areas, especially in digital contexts such as social media or online gaming, which have become central to adolescent social life. Fourth, cultural bias remains a significant concern. A substantial 88% of the instruments reviewed are grounded in Western cultural norms and assumptions about communication, potentially limiting their validity and interpretability in non-Western settings. This is particularly problematic in high-context cultures such as Indonesia where indirectness, nonverbal cues, and hierarchical relationships play a critical role in pragmatic appropriateness. Instruments like TOPL or ADOS, although psychometrically robust in Western populations, may not capture culturally specific forms of communication, thus risking misdiagnosis or under-identification in diverse populations.

Finally, two specific populations remain underserved by current pragmatic assessment practices: nonverbal children with ASD and adolescents who primarily engage in digital communication. Only two instruments explicitly address the needs of nonverbal individuals, despite the fact that many children on the autism spectrum communicate through alternative modalities such as gestures, AAC (augmentative and alternative communication), or behavior-based cues. Additionally, the increasing centrality of digital interaction among adolescents has yet to be reflected in existing assessment tools, which remain focused on face-to-face, verbal communication. These findings collectively underscore the need for the development of more inclusive, culturally responsive, and contextually relevant pragmatic assessment tools—ones that account for diverse communication styles, developmental stages, and sociocultural environments.

4. Conclusion

This study provides a comprehensive review of the development of pragmatic assessment instruments for children with Autism Spectrum Disorder (ASD), identifying 26 tools from 21 eligible studies. The analysis highlights both notable progress and persistent limitations in current practices. Advancements include the incorporation of multimodal approaches, video-based stimuli, and nonverbal elements, which enhance ecological validity and capture a wider range of communicative abilities. However, several critical challenges remain unresolved.

First, over half of the instruments continue to depend on third-party reports from parents or teachers. While practical, this reliance risks missing dynamic, real-time aspects of social interaction. Second, most tools emphasize basic communicative functions, while paralinguistic and nonverbal features—crucial in understanding pragmatic competence—remain underrepresented. Third, the age coverage of instruments is skewed toward children under 12, leaving adolescents' more complex pragmatic demands, particularly in digital communication, largely unaddressed. Fourth, the overwhelming dominance of Western cultural frameworks (88%) raises concerns about cross-cultural validity, especially in high-context societies such as Indonesia. Finally, nonverbal children and adolescents engaged primarily in digital communication remain underserved populations.

Taken together, these findings underscore the urgent need for developing inclusive, culturally responsive, and developmentally appropriate pragmatic assessment tools. Such tools should move beyond narrow functional measures, accommodate diverse communication modalities, and adapt to evolving social contexts—including digital platforms. By addressing these gaps, future instruments can better support accurate diagnosis, guide effective intervention, and ultimately improve the quality of life for individuals with ASD.

The contributions of this review lie not only in mapping current instruments but also in identifying critical gaps and future directions. For researchers and clinicians, these insights provide a foundation to design assessment tools that are more contextually relevant and equitable across cultures. For policymakers and practitioners in Indonesia and similar contexts, the findings emphasize the importance of fostering locally adapted tools to ensure that pragmatic assessments are both valid and meaningful for diverse populations.

Acknowledgments

References

Alduais, A., Majorano, M., Andrés-Roqueta, C., Hamaguchi, P., Persici, V., & Qasem, F. (2022). Conceptualizing, defining, and assessing pragmatic language impairment in clinical settings: A scoping review. *Infant and Child Development, 31*(6), e2368. https://doi.org/10.1002/icd.2368

Booth, A., Martyn-St James, M., Clowes, M., & Sutton, A. (2021). *Systematic approaches to a successful literature review*. SAGE.

Burgoon, J. K., Manusov, V., & Guerrero, L. K. (2021). *Nonverbal communication*. Routledge.

Durosini, I., & Aschieri, F. (2021). Therapeutic assessment efficacy: A meta-analysis. *Psychological Assessment, 33*(10), 962–974. https://doi.org/10.1037/pas0001047

Ilmi, A. B. I., & Degaf, A. (2024). Cross-cultural insights into phatic communication: Indonesian and Australian student interactions. *Deskripsi Bahasa, 7*(2), 150–168. https://doi.org/10.22146/db.v7i2.1540

Issac, A., Halemani, K., Shetty, A., Thimmappa, L., Vijay, V. R., Koni, K., ... & Kapoor, V. (2025). The global prevalence of autism spectrum disorder in children: A systematic review and meta-analysis. *Osong Public Health and Research Perspectives, 16*(1), 3–12. https://doi.org/10.24171/j.phrp.2025.16.1.03

Kiogora, N. (2025). Exploring common co-occurring conditions like ADHD, anxiety, depression and epilepsy in individuals with autism and how to manage these additional challenges. *International Academic Journal of Health, Medicine and Nursing, 2*(2), 39–49.

Muniroh, R. D. D. A., & Heydon, G. (2024). The efficacy of the Delphi method for adapting cognitive interviewing instructions into culturally and linguistically diverse international policing contexts. *The International Journal of Speech, Language and the Law, 31*(1), 131–153. https://doi.org/10.1558/ijsll.24887

Naeem, M., Ozuem, W., Howell, K., & Ranfagni, S. (2023). A step-by-step process of thematic analysis to develop a conceptual model in qualitative research. *International Journal of Qualitative Methods, 22*, 16094069231205789. https://doi.org/10.1177/16094069231205789

Reindal, L., Nærland, T., Weidle, B., Lydersen, S., Andreassen, O. A., & Sund, A. M. (2023). Structural and pragmatic language impairments in children evaluated for autism spectrum disorder (ASD). *Journal of Autism and Developmental Disorders, 53*(2), 701–719. https://doi.org/10.1007/s10803-022-05801-2

Satria, M. R. (2024, May). Research on the development of assessment instruments in Indonesia. In *International Conference on Current Issues in Education (ICCIE 2023)* (pp. 73–81). Atlantis Press. https://doi.org/10.2991/978-94-6463-234-2_9

Solmi, M., Song, M., Yon, D. K., Lee, S. W., Fombonne, E., Kim, M. S., ... & Cortese, S. (2022). Incidence, prevalence, and global burden of autism spectrum disorder from 1990 to 2019 across 204 countries. *Molecular Psychiatry, 27*(10), 4172–4180. https://doi.org/10.1038/s41380-022-01868-6