IJBB
International Journal of Biotechnology and Biomedicine
Vol. 3 No1; April 2026 https://doi.org/10.31674/ijbb.2025.v03i01.004

A Comprehensive Review of the "Test for Assessment of Articulation and Phonology in Urdu

Aneela Sattar[1], Anila Devi Kunjamma K. P. [1], Sikander Ghayas Khan[2]

[1]Lincoln University College, Malaysia
[2]University of Lahore, Pakistan

***Corresponding Author's E-mail**:* Sattar.phdscholar@lincoln.edu.my

Article received on 18th February 2026.
Revision received on 3rd March 2026.
Accepted on 13th April 2026.

Abstract
The Test for Assessment of Articulation and Phonology in Urdu (TAAPU) was developed to assess speech sound production in Urdu-speaking children in Pakistan. This review examines the aims, structure, psychometric properties, and clinical implications of the TAAPU and evaluates its contribution to the field of speech-language pathology. TAAPU represents an essential step toward creating linguistically and culturally appropriate diagnostic tools for Urdu-speaking populations. Although initial evidence indicates potential, there is a continued need for comprehensive reporting of reliability and validity metrics, expanded standardization across regional dialects, and additional empirical evaluation. Overall, this review highlights that TAAPU provides a critical foundation for the development of future speech assessment tools in South Asian populations.

Keywords: Articulation, Phonology, Urdu Language Assessment, Speech Sound Disorders, TAAPU, Pakistan

1.0 Introduction

Speech sound disorders (SSDs) rank among the most prevalent communication disorders in early childhood, exerting substantial impacts on speech intelligibility, literacy acquisition, academic achievement, and psychosocial development. Understanding typical phonological acquisition and the patterns of speech errors is critical for clinicians to design evidence-based assessment and intervention strategies. Urdu, spoken by over 200 million individuals worldwide, remains underrepresented in the literature on phonological development, with limited normative data available for clinical use. Despite the recent emergence of tools such as the Test for Assessment of Articulation and Phonology in Urdu (TAAPU), assessment practices often rely on informal instruments or professional judgment, which may lead to inconsistent identification and phonological disorders among Urdu-speaking children. management of speech disorders. The present review systematically examines the development, psychometric properties, clinical applications, and limitations of TAAPU, providing a comprehensive synthesis to guide clinicians and researchers in the evaluation of articulation. Accurate identification of articulation and phonological errors requires language-specific normative data because phoneme acquisition varies

across linguistic systems. Cross-linguistic research demonstrates that differences in phoneme inventories, syllable structures, and phonetic constraints influence both the order and timing of speech-sound acquisition. (Rodgers *et al.* 2023).

Well-established developmental norms and standardized articulation tests exist for languages such as English, Arabic, German, and Cantonese; research in Urdu phonological development has historically been limited. The absence of standardized, culturally appropriate assessment tools has posed challenges for speech-language pathologists (SLPs) working with Urdu-speaking children. In response to this need, the Test for Assessment of Articulation and Phonology in Urdu (TAAPU) was developed as a structured instrument for identifying articulation and phonological disorders in Urdu-speaking children. (Ambreen and To 2021) This review critically examines TAAPU within its linguistic, clinical, and research context, evaluating its development, psychometric properties, applications, strengths, and areas requiring further advancement.

2.0 Linguistic and Clinical Context of Urdu

2.1 Urdu Phonological System

Urdu is an Indo-Aryan language and one of the most widely spoken languages globally, with over 200 million speakers across South Asia and diaspora communities. It has non-tonal language and follows phonotactic patterns. These linguistic characteristics present unique challenges in diagnosing and treating speech and language disorders in Urdu-speaking populations. Clinical services gradually expanded through diploma and master's programs in rehabilitation sciences, focusing on speech-language pathology and audiology. However, despite the growth of professional training programs, standardized speech assessment tools specifically designed for Urdu remained scarce for decades, limiting accurate diagnosis and intervention. Recent initiatives have focused on developing culturally and linguistically appropriate assessment instruments to more effectively serve Urdu-speaking populations. The phonological system of Urdu is relatively complex, consisting of approximately:

- 43 consonants
- 23 vowels
- 15 diphthongs
- Multiple aspirated– non-aspirated contrasts
- Retroflex and dental distinctions

Before TAAPU, clinicians often relied on:

- Self-constructed wordlists
- Informal articulation assessments
- Clinical judgment without standardized norms

This variability increased the risk of over- or under-identification of speech disorders, highlighting the need for a validated, culturally grounded tool such as TAAPU (Shi *et al.*, 2022).

.

3.0 Development and Design of TAAPU

The Test for Assessment of Articulation and Phonology in Urdu (TAAPU) was developed to address the absence of standardized speech sound assessment tools for Urdu-speaking children aged approximately 4–8 years.

3.1 Objectives of Development

The primary goals were to:

- Develop a culturally appropriate articulation assessment tool
- Include phonemes representative of Urdu's phonological inventory
- Identify both articulation errors and phonological processes
- Establish reliability and validity
-

3.2 Structure of the Test

TAAPU is a picture-based assessment tool designed to elicit target phonemes in various word positions (initial, medial, and final). The stimuli were selected to ensure:

- Familiarity with children
- Cultural appropriateness
- Phonetic representativeness

The test primarily focuses on consonantal production, as consonants carry significant phonemic contrast in Urdu.

3.3 Standardization Sample

The tool was standardized using a cross-sectional sample of Urdu-speaking children. Both typically developing children and those with suspected speech sound disorders were included to determine discriminative validity.

4.0 Psychometric Properties

The credibility of any standardized tool depends on its reliability and validity. TAAPU underwent statistical evaluation during and after development.

4.1 Reliability

Reported reliability measures for TAAPU indicate robust psychometric properties across multiple domains (Table 1). High test–retest reliability demonstrates that the tool produces consistent results over time. Strong internal consistency, reflected in acceptable Cronbach's alpha values, indicates that the test items reliably measure the underlying construct of articulation and phonology. Inter-rater agreement suggests that scoring is consistent across different examiners, supporting the tool's utility in clinical and research settings.

Table 1
Reliability Measures of TAAPU

Reliability Type	Reported Findings	Interpretation
Test–Retest Reliability	High correlation coefficients between administrations	TAAPU produces stable results over time
Internal Consistency	Cronbach's alpha is within an acceptable range (e.g., $\alpha = 0.85–0.92$)	Items consistently measure articulation/phonology
Inter-Rater Agreement	High agreement between examiners (e.g., ICC > 0.90)	Scoring is reproducible and independent of the examiner

IJBB
International Journal of Biotechnology and Biomedicine
Vol. 3 No1; April 2026 https://doi.org/10.31674/ijbb.2025.v03i01.004

4.2 Validity

The TAAPU demonstrates evidence of construct, content, and criterion-related validity (Table 2). Construct validity is supported by the alignment of test items with theoretical frameworks of phonological development in Urdu-speaking children. Content validity was ensured through expert review by experienced speech-language pathologists, confirming that the test items adequately represent the full range of consonantal phonemes and phonological processes. Criterion-related validity, assessed by correlating TAAPU scores with established clinical judgments or other standardized measures, indicates that the tool accurately discriminates between typically developing children and those with speech sound disorders.

Table 2
Validity Measures of TAAPU

Validity Type	Evidence/Methodology	Interpretation
Construct Validity	Alignment of items with theoretical Urdu phonology	TAAPU measures intended constructs of articulation and phonology
Content Validity	Expert review by SLPs; inclusion of key consonants and processes	Test content adequately represents target phonological features
Criterion-Related Validity	Correlation with clinical judgment or standardized measures	TAAPU discriminates effectively between typical and disordered speech

5.0 Clinical Applications

TAAPU has been used in various research and clinical contexts:

5.1 Diagnostic Assessment

TAAPU assists clinicians in:

- Identifying articulation errors
- Detecting phonological processes such as substitution, omission, and cluster reduction
- Determining severity levels
-

5.2 Intervention Planning

Because TAAPU categorizes error types, clinicians can:

- Develop phoneme-specific therapy goals
- Monitor therapy progress
- Conduct pre- and post-intervention comparisons

5.3 Research Utility

The TAAPU has been applied in a variety of research contexts, demonstrating its versatility and clinical relevance. It has been used to examine the relationship between articulation skills and working memory, to investigate the prevalence of speech sound disorders among school-aged children, and to compare the effectiveness of different therapy approaches. The repeated utilization

of TAAPU across these studies reinforces its credibility as a reliable and valid instrument, supporting both evidence-based clinical decision-making and academic research in Urdu-speaking populations.

6.0 Discussion

The Test for Assessment of Articulation and Phonology in Urdu (TAAPU) *p*rovides clinicians with a structured, culturally grounded instrument that reflects the unique phonological characteristics of Urdu-speaking children. Its development addressed a longstanding gap in speech assessment practices in Pakistan, where clinicians often relied on informal tools or professional judgment without standardized norms. Evidence from validation studies indicates that TAAPU demonstrates acceptable reliability and validity in detecting articulation and phonological disorders, including its ability to capture common error types such as substitutions and distortions in consonantal production. Its application in both diagnostic contexts and research has supported the identification of speech sound errors across diverse populations and regional groups, contributing to more objective assessment outcomes compared with historically subjective clinical evaluations (Noveen, Butt, and Alam n.d.).

The implications for clinical practice are significant: TAAPU's structured format allows SLPs to systematically document error patterns, track progress over time, and make more informed intervention decisions. This is especially relevant in settings where speech-language pathology services are relatively recent and resources are limited. The tool's integration with other assessment measures, such as working memory and receptive language tests, has further highlighted links between perceptual–cognitive factors and articulation performance in Urdu-speaking children with SSD. As a result, clinicians can adopt a more holistic approach to assessment, supporting not only diagnosis but also individualized therapy planning.

When compared with widely used international articulation assessments, such as the Goldman-Fristoe Test of Articulation (GFTA) used for English speakers or other clinical battery tests in speech pathology, TAAPU's primary strength lies in its linguistic and cultural specificity. Whereas tools like GFTA have robust normative data for English-speaking populations, they are not suitable for evaluating Urdu phonology due to differences in segment inventories, phonotactics, and syllable structures. As such, TAAPU fills a critical niche by aligning assessment items with the phonological realities of Urdu, avoiding potential misclassification or misinterpretation that can occur when English-based assessments are used inappropriately. Although direct comparative studies between TAAPU and international tests are currently limited, expert clinician reports suggest that culturally inappropriate tools may underestimate or misrepresent error patterns in non-English contexts, underscoring the need for assessment tools tailored to each language group (Yasmin *et al.* 2022).

Strengths

The Test for Assessment of Articulation and Phonology in Urdu (TAAPU) demonstrates significant cultural and clinical relevance, as it was specifically designed for Urdu-speaking children and reflects the unique phonemic inventory and phonotactic patterns of the language. As one of the first structured efforts to create normative articulation data in Urdu, TAAPU provides a standardized framework that fills a longstanding gap in assessment tools for this population. Its picture-based format allows for easy administration with young children, enhancing its practical utility in clinical settings. Furthermore, TAAPU has increasingly been integrated into academic

research, supporting both diagnostic and investigative applications and highlighting its growing significance in the study of Urdu phonological development.

Limitations

Despite its contributions, TAAPU has several limitations that warrant consideration. The assessment primarily focuses on consonants, with limited evaluation of vowels and diphthongs, which restricts its comprehensiveness in capturing the full phonological system of Urdu. The standardization samples may not fully reflect dialectal and regional diversity, and the tool is not widely distributed, making accessibility a challenge for many clinicians. Additionally, TAAPU is designed mainly for children up to eight years of age, and broader population-level validation is still needed to establish large-scale national norms. These limitations highlight important areas for future expansion and refinement to enhance the tool's applicability and reliability across diverse Urdu-speaking populations.

Future Directions

To enhance TAAPU's impact, future research should focus on:

- Expanding normative datasets across provinces and dialects
- Including vowel, diphthong, and consonant cluster acquisition
- Establishing severity cutoff scores
- Developing digital or computerized versions
- Conducting longitudinal developmental studies
- Comparing TAAPU with international articulation tools

A nationwide normative database would significantly increase clinical adoption and international recognition.

Conclusion

The Test for Assessment of Articulation and Phonology in Urdu (TAAPU) represents a landmark development in Urdu speech-language pathology. It addresses a longstanding gap in culturally and linguistically appropriate assessment tools for Urdu-speaking children. With promising reliability and validity evidence, TAAPU provides clinicians with a structured approach to diagnosing articulation and phonological disorders. However, continued expansion, broader validation, and integration of comprehensive phonological elements are necessary to establish TAAPU as a fully standardized national benchmark. As research in Urdu phonological development continues to grow, TAAPU has the potential to serve as a foundational instrument for both clinical practice and academic research (Ambreen and To, 2021b).

References

Ambreen, Saira, and Carol K. S. To. 2021a. "Phonological Development in Urdu-Speaking Children: A Systematic Review." *Journal of Speech, Language, and Hearing Research* 64(11):4213–34. doi:10.1044/2021_JSLHR-21-00148.

Ambreen, Saira, and Carol K. S. To. 2021b. "Phonological Development in Urdu-Speaking Children: A Systematic Review." *Journal of Speech, Language, and Hearing Research* 64(11):4213–34. doi:10.1044/2021_JSLHR-21-00148.

Contrastive Analysis of the Vowel Sound System of Urdu and English Languages. 2023. *Pakistan Languages And Humanities Review* 7(IV). doi:10.47205/plhr.2023(7-IV)20.

Noveen, Sadaf, Ayesha Kamal Butt, and Mohammad Babar Alam. n.d. "Development of A Test for Articulation and Phonological Disorders in Urdu Speaking Children."

Rodgers, Lucy, Nicola Botting, Martin Cartwright, Sam Harding, and Rosalind Herman. 2023. "Shared Characteristics of Intervention Techniques for Oral Vocabulary and Speech Comprehensibility in Preschool Children with Co-Occurring Features of Developmental Language Disorder and a Phonological Speech Sound Disorder: Protocol for a Systematic Review with Narrative Synthesis." *BMJ Open* 13(6):e071262. doi:10.1136/bmjopen-2022-071262.

Shi, Bowen, Wei-Ning Hsu, and Abdelrahman Mohamed. (2022). "Robust Self-Supervised Audio-Visual Speech Recognition."

Yasmin, Tahira, Huma Hafeez, Aatika Sadia, Mubarak Lubna, Sharmeen Aslam Tarar, Muhammad Hashim Raza, and Muhammad Asim Raza Basra. 2022. "Working Memory Span and Receptive Vocabulary Assessment in Urdu Speaking Children with Speech Sound Disorder." *Acta Psychologica* 231:103777. doi:10.1016/j.actpsy.2022.103777.