RESEARCH ARTICLE

A Developmentally and Culturally Grounded Imitation Assessment for Arabic-Speaking Preschoolers with ASD: Initial Validation in Algeria

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Abstract
This study presents the development and preliminary validation of a culturally and linguistically adapted imitation assessment tool for Algerian children aged 3 to 5 years with Autism Spectrum Disorder (ASD). Grounded in both developmental theory and clinical practice, the tool was designed to capture a broad range of imitation behaviors, spanning motor-object, motor-body, and verbal domainsthrough collaborative input from clinicians and caregivers. Data were collected from 54 children with clinically confirmed ASD, with a subsample of 35 completing a test–retest protocol after two weeks. Exploratory factor analysis revealed a clear two-factor structure, motor and verbal imitationexplaining 76.87% of total variance. Strong internal consistency (Cronbach's $\alpha = .979$), excellent test–retest reliability ($\varrho = .977$), and robust item–total correlations confirmed the scale's psychometric strength. Importantly, the tool addresses a critical gap in culturally appropriate developmental assessments for Arabic-speaking populations. While promising, these findings are preliminary; larger and more diverse samples are needed to confirm generalizability and predictive validity. This tool offers a culturally sensitive, developmentally grounded resource for early ASD identification and intervention planning in North African contexts.products, potentially emptying them of their profound meanings.
JEL Classification: L26, L82, Z11, O53, O3

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1. Introduction

Imitation plays a pivotal role in early social-cognitive development, serving as a foundation through which children acquire a range of essential skills, including motor coordination, language, affective communication, and social interactionby observing and reproducing the behavior of others (Pittet et al., 2022). For typically developing children imitation facilitates not only the learning of specific actions but also the development of joint attention, cooperation, empathy, and symbolic play, all of which are critical for early social learning(Heimann, 2022; Tomasello, 1999).

In contrast, children with Autism Spectrum Disorder (ASD) often demonstrate pervasive deficits in imitation across multiple domains. These include motor imitation (e.g., clapping hands), object imitation (e.g., copying the use of a toy), and verbal imitation (e.g., echoing sounds or words), each of which contributes uniquely to social-communicative growth. Research has shown that motor imitation deficits are associated with poorer fine motor skills and social engagement(Rogers & Pennington, 1991), object imitation is linked to limitations in pretend play and functional use of objects(Ingersoll & Schreibman, 2006), and verbal imitation is a well-established predictor of expressive language development(Toth et al., 2006). Children with ASD often struggle to initiate or respond to imitation, leading to cascading effects on learning, social bonding, and communication.

Longitudinal studies have demonstrated that imitation difficulties in children with ASD can be identified as early as 12 months of age and typically persist into preschool years (Pittet et al., 2022; Young et al., 2011). These difficulties are not merely isolated skill deficits, they are closely tied to broader developmental outcomes. For example, children with more pronounced imitation challenges often present with lower language and cognitive scores and more severe ASD symptomatology (Pittet et al., 2022; Strid et al., 2006). Encouragingly, imitation-based interventions, such as the Early Start Denver Model (ESDM), have shown effectiveness in improving social-communicative outcomes, particularly when targeting gesture, motor, and verbal imitation (Dawson et al., 2010; Xiao & Li, 2025).

Given the recognized importance of imitation in ASD intervention and assessment, the availability of reliable, culturally appropriate tools is essential. Currently, several standardized instruments exist to assess imitation in early childhood, including the Imitation Battery (Luyster et al., 2008), the Preschool Imitation and Praxis Scale (PIPS) (Vanvuchelen et al., 2011), and components within larger developmental assessments. While these tools provide structured evaluation, they share critical limitations: they are often time-consuming, require trained specialists, and were developed within Western cultural-linguistic contexts. Such instruments may not adequately reflect the social norms, communication styles, or educational realities of non-Western populations, including those in the Arab world.

Indeed, within Arab-speaking or North African contexts, there is a notable scarcity of validated imitation assessment tools designed specifically for children with ASD. Existing tools have rarely been adapted, normed, or linguistically validated for use in countries like Algeria, where language diversity (e.g., Algerian Arabic, Berber dialects, and French influence) and differing cultural norms can affect the interpretation and execution of imitation tasks. This creates a significant assessment gap: clinicians, parents and educators often rely on translated versions of Western tools, which may not accurately capture imitation ability in local populations, potentially leading to misdiagnosis or inappropriate intervention planning.

To address these gaps, the current study aimed to preliminary develop and psychometrically validate an imitation assessment tool specifically designed for Algerian children with ASD between the ages of 3 and 5 years. By focusing on culturally relevant content and covering key imitation domains, motor imitation, object-based imitation, and verbal imitation, this tool seeks to provide clinicians, educators, and researchers with a reliable, contextually meaningful instrument that supports early identification and intervention planning in the Algerian setting.

2. Method

Design

This study employed a quantitative, cross-sectional design.

1. **Participants**

The study included 54 children aged 3 to 5 years (48 males, 06 females) diagnosed with autism spectrum disorder (ASD), all of whom had confirmed clinical diagnoses based on the Childhood Autism Rating Scale (CARS) and comprehensive medical and developmental histories. A subset of 35 children from the ASD group (31 males, 4 females) participated in a test–retest reliability evaluation after a two-week interval to assess the temporal stability of the tool.

Given the limited sample size (N = 54), this study is positioned as a preliminary validation, intended to provide foundational evidence for future large-scale validation studies.

Participants were recruited through purposive sampling from public and private clinics in cities of Ghardaïa, Ouargla, and Laghouat. Children were eligible for inclusion if they Algerian native speakers, (1) were aged between 3 and 5 years, (2) had a confirmed ASD diagnosis based on CARS, and (3) had no other major neurological or sensory impairments.

Measure Development

The tool consists of 24 structured items designed to be completed jointly by parents and clinicians, based on observations of imitation behaviors exhibited by the child over the past 15 days. Developed to reflect the multidimensional nature of early imitation skills in children with Autism Spectrum Disorder (ASD), the tool is grounded in both developmental and clinical frameworks. It comprises three primary domains: motor-object imitation, which includes functional, non-functional, and sequential actions involving objects; motor-body imitation, which is further divided into fine motor, gross motor, and visually guided imitation; and verbal imitation, encompassing the repetition of single sounds and single words. This domain structure is informed by previous research emphasizing the distinct developmental trajectories and cognitive demands associated with different forms of imitation (Ingersoll & Schreibman, 2006; Rogers & Pennington, 1991).

Each item is rated on a 3-point scale (1 = no response, 2 = partial response, 3 = full response). All items were reviewed by a panel of seven experts, including psychologists and speech therapists, with each achieving a Content Validity Index (CVI) of 0.80 or higher. Minor wording revisions were made to enhance clarity, and feedback from ten parents further supported the ecological and cultural relevance of the items.

Procedure

Data collection was conducted between October 2022 and June 2025. Informed consent was obtained from the parents of all participants. The assessment tool was administered by trained specialists in clinical psychology or speech-language pathology. Assessments took place during structured sessions held in both public and private clinics, with the child's primary caregiver present, in the cities of Ghardaïa, Ouargla, and Laghouat. To evaluate test–retest reliability, a subset of 35 children with ASD completed the assessment a second time, two weeks after the initial session.

Data Analysis

Data were analyzed using SPSS version 22 to evaluate the tool's validity and reliability. Validity was assessed through exploratory factor analysis to establish construct validity, expert review to ensure content validity, and item difficulty analysis to further support construct validity. Reliability was examined using item-total and domain-total correlations to assess internal consistency, along with Cronbach's alpha, split-half reliability, and test-retest reliability methods.

3. Validity Analysis

Construct validity

Table 1. KMO and Bartlett's Test of Sampling Adequacy

Test	Value
Kaiser-Meyer-Olkin Measure (KMO)	.868
Bartlett's Test of Sphericity	$\chi^2(276) = 1775.86$ $p < .001$

Table 2. Total Variance Explained by Extracted Factors

Factor	Eigenvalue	% Variance Explained	Cumulative %	Representative Items
Factor 1	16.35	68.1%	68.1%	Items 1–18
Factor 2	2.10	8.7%	76.87%	Items 19–24

Table 3. Extracted Communalities for Each Item

Range of Communalities	.531 – .895
Extraction Method	Principal Axis Factoring

Table 4. Factor Loadings from the Rotated Pattern Matrix

Item Group	Factor	Loading
Item1 – item18	1	> .60
Item19 – item24	2	.779 – .942

The Kaiser-Meyer-Olkin measure of sampling adequacy (Table 01) was 0.868, and Bartlett's test of sphericity was significant ($\chi^2 = 1775.86$, df = 276, $p < .001$), confirming the suitability of the data for factor analysis. Two factors with eigenvalues greater than one were extracted (Table 02), accounting for a cumulative 76.87% of the total variance. Communalities were strong across all items (Table 03), ranging from 0.531 to 0.895, indicating a high degree of shared variance with the extracted factors. Based on the pattern matrix (Table 04) and theoretical foundations, the factors were interpreted as: (1) Motor Imitation, comprising both object-based and body imitation, and (2) Verbal Imitation, encompassing sound and word-level repetition. All items in Factor 2 showed high loadings (0.779–0.942), supporting a clear distinction between motor and verbal imitation domains.

Content Validity

A panel of seven experts, including clinical psychologists and speech-language pathologists, evaluated the scale's items for relevance, clarity, simplicity, and representativeness. They confirmed the items effectively captured core verbal behavior domains, with minor revisions suggested by five experts to improve clarity and simplicity in three items.

Item Difficulty Analysis

Table 5. Item Difficulty Indices

Item	Mean	Difficulty	Item	Mean	Difficulty
Item 1	2.28	0.76	Item 2	2.15	0.72
Item 3	2.26	0.75	Item 4	2.41	0.80
Item 5	2.02	0.67	Item 6	2.11	0.70
Item 7	1.98	0.66	Item 8	1.72	0.57
Item 9	2.00	0.67	Item 10	2.06	0.69
Item 11	2.22	0.74	Item 12	2.26	0.75
Item 13	2.15	0.72	Item 14	2.15	0.72
Item 15	2.30	0.77	Item 16	2.41	0.80
Item 17	2.24	0.75	Item 18	2.04	0.68
Item 19	1.80	0.60	Item 20	1.80	0.60
Item 21	1.85	0.62	Item 22	1.78	0.59
Item 23	1.80	0.60	Item 24	1.76	0.59

The imitation assessment items (Table 05) show a mean score range from 1.72 to 2.41 on a 3-point scale, with corresponding item difficulty indices ranging from 0.57 to 0.80. This indicates a moderate and balanced level of difficulty across the 24 items. Easier items, such as Item 4 and Item 16 (mean = 2.41; difficulty = 0.80), were completed successfully by most children, suggesting they measure more accessible imitation behaviors. In contrast, more challenging items, such as Item 8 (mean = 1.72; difficulty = 0.57), appear to require higher-level imitation skills and help distinguish between children with varying abilities. The overall spread of item difficulty supports the tool's sensitivity in assessing a wide range of imitation competencies among children with ASD.

4. Reliability Analysis

Internal Consistency

Item-Total and Domain-Total Correlations

Table 6. Spearman's Correlations Between domains and Total Score

	Total	Object Motor Imitation	Body Motor Imitation	Verbal Imitation
		.957**	.909**	.871**

N = 54; All correlations are Spearman's rho. ***p*** *< .001 (2-tailed).*

Table 7. Spearman's Item–Total Correlations.

Item	R	Item	R	Item	R
Item 1	.756**	Item 2	.836**	Item 3	.785**
Item 4	.810**	Item 5	.863**	Item 6	.827**
Item 7	.790**	Item 8	.752**	Item 9	.836**
Item 10	.843**	Item 11	.847**	Item 12	.830**
Item 13	.882**	Item 14	.844**	Item 15	.837**
Item 16	.805**	Item 17	.831**	Item 18	.820**
Item 19	.824**	Item 20	.834**	Item 21	.860**
Item 22	.780**	Item 23	.771**	Item 24	.753**

N = 53; All correlations are Spearman's rho. p < .001 (2-tailed).

Based on (Table 06), strong and statistically significant correlations were found between each domain of imitation and the total score (Spearman's ϱ ranging from .871 to .957, $p < .001$). The highest correlation was observed between the total score and Object Motor Imitation (ϱ = .957), followed by Body Motor Imitation (ϱ = .909) and Verbal Imitation (ϱ = .871). These results indicate that all three domains are closely aligned with the overall imitation construct, with object-related motor imitation contributing most strongly to the total performance.

The item–total correlations (Table 07) ranged from .752 to .882, all significant at $p < .001$. These consistently strong positive correlations suggest that each item is a meaningful contributor to the overall scale. Items such as Item 13 (ϱ = .882) and Item 5 (ϱ = .863) showed particularly high item–total associations, while even the lower end of the range (e.g., Item 8: ϱ = .752) remained well above acceptable thresholds. This further supports the internal consistency and construct validity of the tool.

Cronbach's Alpha

Table 8. Reliability Analysis (Cronbach's Alpha) for the Domain of the Scale

Domain	Number of Items	Cronbach's Alpha (α)
Object Imitation	*9 items*	0.789
Body Imitation	9 items	0.972
Verbal Imitation	6 items	0.967

Table 9. Reliability Analysis (Cronbach's Alpha) for the Items of the Scale

Item	Corr. Item-Total	α if Deleted	Item	Corr. Item-Total	α if Deleted
item1	0.723	0.979	item2	0.803	0.978
item3	0.754	0.979	item4	0.799	0.978
item5	0.846	0.978	item6	0.825	0.978
item7	0.786	0.979	item8	0.728	0.979
item9	0.853	0.978	item10	0.856	0.978
item11	0.870	0.978	item12	0.848	0.978
item13	0.900	0.978	item14	0.851	0.978
item15	0.844	0.978	item16	0.801	0.978
item17	0.822	0.978	item18	0.838	0.978
item19	0.794	0.978	item20	0.801	0.978
item21	0.837	0.978	item22	0.736	0.979
item23	0.734	0.979	item24	0.709	0.979

All three domains showed good internal consistency (Table 08), with body imitation (α = 0.972) and verbal imitation (α = 0.967) demonstrating excellent reliability. Object imitation (α = 0.789) was acceptable.

The overall Cronbach's Alpha coefficient for the imitation assessment tool (Table 09) was exceptionally high (α = .979), indicating excellent internal consistency across the 24 items. The Corrected Item–Total Correlations ranged from .709 (Item 24) to .900 (Item 13), suggesting that all items are strongly associated with the total scale score and contribute meaningfully to the overall construct.

The "Cronbach's Alpha if Item Deleted" values remained consistently at or near .978–.979 across all items, indicating that removing any single item would not significantly improve the reliability of the scale. This further confirms that each item adds value without introducing measurement error.

Table 10. Split-Half Reliability Statistics

					Correlation
CorrelationBetweenForms	0.922	Spearman-Brown (EqualLength)	0.959	Guttman Split-Half Coefficient	0.959
					Statistic
Part 1 Alpha	0.963	Part 2 Alpha	0.961	Total	24 items

Table 11. Item-Total Correlations and Cronbach's Alpha if Item Deleted

Item	Corr. Item-Total	α if Deleted	Item	Corr. Item-Total	α if Deleted
Item 1	0.723	0.979	Item 2	0.803	0.978
Item 3	0.754	0.979	Item 4	0.799	0.978
Item 5	0.846	0.978	Item 6	0.825	0.978
Item 7	0.786	0.979	Item 8	0.728	0.979
Item 9	0.853	0.978	Item 10	0.856	0.978
Item 11	0.870	0.978	Item 12	0.848	0.978
Item 13	0.900	0.978	Item 14	0.851	0.978
Item 15	0.844	0.978	Item 16	0.801	0.978
Item 17	0.822	0.978	Item 18	0.838	0.978
Item 19	0.794	0.978	Item 20	0.801	0.978
Item 21	0.837	0.978	Item 22	0.736	0.979
Item 23	0.734	0.979	Item 24	0.709	0.979

Split-half reliability analysis (Table 10) showed strong internal consistency, with both the Spearman–Brown and Guttman coefficients at 0.810. High Cronbach's alpha values for each half (Part 1 = 0.970; Part 2 = 0.975) further support the scale's reliability.

Item-level analysis (Table 11) revealed corrected item–total correlations between 0.701 and 0.868, indicating all items contribute meaningfully. The alpha if item deleted ranged narrowly (0.974–0.976), suggesting no item significantly affects reliability.

Test–Retest Reliability

Table 12. Test–Retest Reliability (Spearman Correlation)

Variables	ϱ (Spearman)	Sig. (2-tailed)	N
test – r -test	**ϱ =.977	p < .01	33

As shown in (Table 12), the correlation between the first and second administrations was $\varrho = 0.977$, $p < .01$, based on a sample of 33 participants. This high and statistically significant Spearman correlation indicates strong temporal reliability, suggesting that the instrument produces stable and consistent results over time

5. Discussion

The current study aimed to develop and validate a culturally grounded imitation assessment tool, a culturally and linguistically adapted measure designed to be completed by both clinicians and caregivers, to assess imitation behaviors in Algerian children with Autism Spectrum Disorder (ASD), aged 3 to 5 years. The findings provide

compelling evidence of the tool's psychometric strength, including its content and construct validity, item quality, and various indicators of reliability. These results support the tool's construct validity, internal consistency, and test–retest reliability highlighting its potential for reliable use in clinical, educational, and research settings. This is especially important in North African and Arabic-speaking contexts, where culturally appropriate developmental assessment tools remain critically underrepresented (Bishop-Fitzpatrick et al., 2019; Zeanah et al., 1997).

The detailed domain structure of the tool also contributed to its strong psychometric properties. By distinguishing between different types of motor-object imitation (functional, non-functional, and sequential), the scale captures both basic and more complex forms of purposeful action. Similarly, separating motor-body imitation into fine motor, gross motor, and visually guided components allows for a precise evaluation of sensorimotor integration, which is often affected in children with ASD (Mostofsky & Ewen, 2011). The verbal domain, although smaller, effectively captures the early emergence of phonological and lexical imitationwhich are crucial for later language development (Paul et al., 2013; Toth et al., 2006). This granular structure enhances the clinical interpretability of assessment results and may guide targeted interventions across domains.

Construct validity was supported through an Exploratory Factor Analysis (EFA), which yielded a clear and theoretically meaningful two-factor structure: motor imitation (Factor 1) and verbal imitation (Factor 2). These two domains are consistent with longstanding cognitive and developmental theories of imitation in early childhood (Meltzoff & Moore, 1977; Rogers & Pennington, 1991). The first factor motor imitation , comprised 18 items spanning both body-based and object-based imitation tasks. The second factor included 6 items capturing verbal imitation skills. The model explained a substantial 76.87% of total variance, with very high factor loadings (ranging from .566 to .969), confirming that items coherently cluster around the hypothesized latent traits.

This two-factor solution echoes empirical findings from past research. For instance, (Ingersoll & Schreibman, 2006)emphasized the role of both motor and verbal imitation in early social learning among children with ASD, while (Toth et al., 2006) found that deficits in these two domains may follow somewhat independent developmental trajectories. The clear loading of verbal imitation items onto a distinct factor in this study supports this dual-track developmental hypothesis. Interestingly, the lower inter-correlation between body and verbal imitation (ϱ = .661) further reinforces this distinction, possibly reflecting the different neural mechanisms that underlie linguistic and motoric learning (Paul et al., 2013; Williams et al., 2001).

Also, The content validity assessment, conducted by a panel of experts, confirmed that the scale items were both relevant and representative of the domains of imitation behavior. Minor modifications were recommended to improve clarity, which underscores the collaborative rigor in tool refinement and ensures that the final version is both practical and culturally appropriate for the Algerian setting.

The item difficulty analysis revealed a distribution of indices ranging from 0.59 to 0.80, indicating that the tool contains items of varying challenge levels. This is ideal for discriminating among different developmental levels within a clinical population. More difficult items, particularly those in the verbal imitation subscale (e.g., Items 22–24), likely assess more complex representational or symbolic functions. These findings support developmental theories positing that verbal imitation emerges later and depends on more sophisticated cognitive-linguistic systems(Charman et al., 1998; Rogers et al., 2003). Conversely, items with lower difficultytypically from the object imitation domain, may capture more fundamental imitative capacities and are especially relevant for identifying children at the earliest stages of skill acquisition.

Additionally, Item-level and domain-level correlations strongly support the scale's internal consistency. All 24 items showed significant and strong correlations with the total score (ϱ = .752 to .882), which affirms their meaningful contribution to the construct of imitation. Furthermore, the three domains, object, body, and verbal imitation, were all highly correlated with the total score (ϱ = .957, .909, and .871 respectively). This suggests that imitation is a multi-dimensional construct, yet the subcomponents are tightly integrated in the broader context of early social-communicative development. Such findings are consistent with research indicating that imitation is foundational to later language, play, and social reciprocity skills in ASD (Victorian ASELCC Team et al., 2013; Young et al., 2011).

In terms of reliability, the scale demonstrated excellent internal consistency. The Cronbach's alpha for the full 24-item scale was .979, indicating a very high level of reliability. Corrected item–total correlations ranged from .709 to .900, showing that each item contributed meaningfully to the overall construct without redundancy. Notably, no item if removed would substantially improve internal consistency, as the "alpha if deleted" values remained between .978 and .979 for all items. This further confirms the internal cohesion of the scale. These results also align with the reliability observed across subdomains: object imitation (α = .789), body imitation (α = .972), and verbal imitation (α = .967), all demonstrating strong internal consistency. The high reliability of the verbal imitation domain, despite its smaller number of items, suggests that its items are particularly well-targeted and psychometrically efficient. Overall, these findings are consistent with established tools such as the Early Social Communication Scales (ESCS; Mundy et al., 2003) and the PEP-3 (Schopler et al., 2016), which similarly distinguish between motor and verbal imitation as key diagnostic dimensions

Furthermore, Split-half reliability analysis indicated strong internal consistency, with both the Spearman–Brown and Guttman coefficients recorded at 0.810. Additionally, the high Cronbach's alpha values for each half of the scale (Part 1 = 0.970**,** Part 2 = 0.975**)** further support the overall reliability of the instrument. Item-level analysis also confirmed the scale's internal coherence, with corrected item–total correlations ranging from 0.701 to 0.868, demonstrating that all items contribute meaningfully to the overall construct. the "alpha if item deleted" values remained within a narrow range (0.974 to 0.976), indicating that no single item had a negative impact on the internal consistency of the scale.

Temporal reliability was also confirmed through test–retest analysis. The very high correlation between initial and follow-up scores (ρ = .977, $p < .001$) suggests the tool provides stable assessments over time. This is particularly crucial in ASD contexts where behavioral variability and context sensitivity can challenge measurement consistency. The findings support the use of the tool in longitudinal assessments, intervention tracking, and repeated evaluations, similar to the goals of other developmental instruments like the Mullen Scales of Early Learning (Mullen, 1995) and the ADOS-2 (McCrimmon & Rostad, 2014).

Taken together, the findings highlight key contributions. First, the tool fills a critical gap in culturally adapted assessments for Arabic-speaking children, especially in North Africa where such tools are limited. This is vital given that direct translations of Western tools often fail to capture culturally embedded behaviors or social communication styles (Hambleton et al., 2004).

Second, by incorporating both motor and verbal dimensions of imitation, the tool provides a more holistic assessment framework. This is aligned with the growing recognition that imitation is not only a diagnostic indicator but also a core target for early intervention("Imitation in Autism Spectrum Disorders," 2014; Victorian ASELCC Team et al., 2013). The tool's structure allows practitioners to identify specific areas of strength and weakness, facilitating individualized intervention planning and progress monitoring.

However, as a preliminary validation, these results should be interpreted with caution. Replication with larger and more diverse samples across Arabic-speaking regions is essential to confirm the tool's broader generalizability.

Despite its strengths, this study has several limitations. The sample size (n = 54), while sufficient for exploratory factor analysis, limits the generalizability of the findings and prevents more advanced analyses such as measurement invariance across demographic subgroups. Future research should aim to replicate and extend these findings using larger, more heterogeneous samples that include both clinical and typically developing children. In addition, conducting a Confirmatory Factor Analysis (CFA) would offer a more rigorous test of the proposed factor structure. Longitudinal studies examining the predictive validity of imitation scores in relation to later outcomessuch as language, play, or adaptive functioningwould also provide valuable insights.

In conclusion, the findings support the tool's initial reliability and validity, highlighting its potential usefulness in early ASD assessment within Arabic-speaking contexts. However, further validation with larger samples is necessary to strengthen its clinical and research utility. Its accessibility and cultural sensitivity make it a promising resource for

clinicians, educators, and researchers alike. Future studies should aim to validate the tool in broader and more diverse Arabic-speaking populations to enhance its generalizability.

Moreover, longitudinal research is encouraged to explore how imitation scores relate to developmental trajectories and intervention outcomes over time. Incorporating observations from teachers and clinicians, alongside caregiver reports, could further enhance the tool's effectiveness as a multi-informant assessment approach for the early identification and support of children with ASD.

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Conflict of Interest. The authors declare that there is no conflict of interest regarding the publication of this article.

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