Hume Studies,
ISSN / eISSN 0319-7336 / 1947-9921
Publisher HUME SOCIETY, OCCIDENTAL COLLEGE
Volume 26-Issue 1-(2026)
DOI:https://doi-0004.org/6812/17884211376824

OPEN ACCESS

Evaluation of School Readiness in Algerian Children: Development and Standardization of a Multidimensional Test (TMMS-DZ) and Study of its Psychometric Properties

Dr. Gani Samia[1], Prof. Bara Sid Ahmed[2]

[1]Researcher, Department of Speech-Language Pathology, Mouloud Mammeri University of Tizi-Ouzou, Laboratory of Language, Communication and Interaction, Algeria, E-mail: samia.gani@ummto.dz

[2]Professor/Researcher, Department of Speech-Language Pathology, Mouloud Mammeri University of Tizi-Ouzou, Laboratory of Language, Communication and Interaction, Algeria, E-mail: sidahmed.bara@ummto.dz

Conflict of Interest: The authors declare that they have no conflicts of interest.

Received: 27/08/2026 ; Published: 03/09/2026

Abstract

School maturity is considered one of the key factors contributing to children's success throughout their educational trajectory, as it reflects their psychological, cognitive, linguistic, and sensorimotor readiness to adapt to the demands of the school environment and benefit from available learning opportunities. Recent educational approaches have moved beyond the traditional view that associates school readiness solely with chronological age, adopting instead a comprehensive and multidimensional perspective that takes into account individual differences in children's growth and development. Although numerous international tests have been developed to assess school maturity, their application in the Algerian context may encounter difficulties related to linguistic, cultural, and social specificities, which may affect the accuracy of their results and the effectiveness of educational decisions based on them.

This study aims to highlight the importance of developing local diagnostic tools for assessing school maturity among children preparing to enter school in Algeria, based on multidimensional linguistic and cognitive indicators adapted to the developmental and cultural characteristics of Algerian children. It also seeks to examine the limitations of relying on chronological age as the sole indicator of school readiness and to emphasize the role of early detection in reducing learning difficulties and school failure.

The findings indicate that assessing school maturity through a multidimensional approach provides a more accurate evaluation of children's actual abilities and readiness, contributes to improving diagnostic and early intervention procedures, supports the quality of speech-language and educational practices, and enhances opportunities for future academic success.

Keywords: School maturity; children preparing to enter school; linguistic and cognitive assessment; speech-language therapy.

Problem Statement

School maturity is one of the key concepts that has received increasing attention in the fields of speech-language pathology, developmental psychology, and educational sciences, given its close relationship with the child's ability to adapt to the school environment and achieve effective learning during the early years of schooling. School readiness is no longer assessed solely according to chronological age; rather, it is now considered an integrated and multidimensional developmental construct encompassing linguistic, cognitive, sensorimotor, emotional, and social competencies that enable children to cope with the new demands imposed by school and interact positively with them. Recent theoretical perspectives, particularly Arnold Gesell's work on maturation, Piaget's theory of cognitive development, and Vygotsky's work on social interaction and language, have confirmed that children do not achieve school readiness according to a uniform developmental pace, but rather through the interaction of multiple biological, cognitive, environmental, and linguistic factors. Recent studies have also shown that early linguistic and cognitive competencies are strong predictors of future school success. Duncan et al. (2007) demonstrated that early language and cognitive skills are directly associated with academic performance during the first years of schooling, whereas Pianta et al. (2009) emphasized that early identification of school unreadiness allows timely intervention and helps reduce learning difficulties and school failure. (Duncan, G.j & AL , 2007, p.1428)

In the same context, Ginette Dionne (2010) highlighted the importance of adopting a multidimensional approach to assessing school maturity, while Anderson (2008) demonstrated a functional relationship between early cognitive development, social adjustment, and school performance. These scientific contributions have established a strong body of evidence showing that the assessment of school maturity cannot be limited to age-related indicators or general cognitive abilities. Rather, it should be based on an integrated set of linguistic, cognitive, and functional indicators, including phonological awareness, attention, perception, memory, language comprehension, and pre-academic skills, as these variables are among those most strongly associated with school readiness and predictive of subsequent learning trajectories. (Sherry & Draper, 2013, p. 451)

Despite this substantial scientific body of knowledge, most internationally used tests for assessing school maturity have been developed in linguistic and cultural contexts that differ from the Algerian context. This raises questions regarding the validity of applying such instruments to Algerian children without local adaptation or standardization. Despite the scientific value of tests such as the WPPSI, Bayley Scales, and Denver Developmental Screening Test, their direct application in Algeria may not provide an accurate assessment of children's abilities, given the influence of early cultural contexts on children's initial acquisitions, as well as the linguistic, cultural, and social diversity characterizing Algerian society. (Gani & Bara , 2025)

In Algeria, the education sector has received increasing attention since independence through continuous reforms aimed at improving educational quality and enhancing the performance of the educational system, alongside the development of early childhood care mechanisms and the strengthening of its position within national educational policies as a critical stage for establishing foundational learning. These efforts have been accompanied by growing scientific and research activity in linguistic and cognitive development and school readiness, seeking to understand the factors influencing children's school success and adaptation to learning demands. In this context, research assessing preschool children's cognitive and linguistic abilities has highlighted the variability observed among pupils in Algerian society. The work of Bara (2003, 2020, 2021, 2025), in particular, emphasized the importance of linguistic and cognitive continuity between family

and school environments and revealed the influence of linguistic, cultural, and social differences on children's school readiness and acquisition of early learning skills. Despite their scientific and educational importance, these efforts have highlighted the need for standardized assessment tools adapted to the linguistic and cultural characteristics of Algerian children, capable of providing a more accurate assessment of school maturity and early identification of learning-related vulnerabilities, thereby guiding educational and speech-language interventions on objective and scientific grounds. (Bara, 2020, p. 134)**.**

Based on these theoretical and empirical considerations, the need emerged for a multidimensional assessment approach based on linguistic, cognitive, and developmental indicators adapted to the linguistic and cultural characteristics of Algerian children. Within this framework, the Algerian Multidimensional School Maturity Test (TMMS-DZ) (Gani & Bara, 2025) was developed and administered as a linguistic-cognitive assessment tool designed to evaluate school readiness among children preparing to enter school. The test is based on contemporary theories of learning and psychometrics, as well as speech-language pathology, while taking into account psychometric properties related to validity, reliability, and diagnostic sensitivity.

The test adopts a multidimensional conceptualization of school maturity, integrating the assessment of linguistic and cognitive abilities, sensorimotor skills, and capacities for comprehension, expression, attention, perception, and memory. This approach allows for a more accurate assessment of school readiness and facilitates the early identification of children at risk of learning difficulties and school failure.

Accordingly, the problem addressed by this study centers on highlighting the importance of assessing school maturity in the Algerian context through the application of the TMMS-DZ and examining its diagnostic and educational value as a locally standardized, multidimensional assessment tool capable of improving assessment procedures, early identification, and speech-language and educational guidance for children preparing to enter school.

Scientific Foundations Underpinning the Development of the School Maturity Test

Research on the factors determining school success has received considerable attention in educational and psychological studies, which have sought to identify the competencies necessary for children's transition from early childhood to school life. This interest has led to the development of various tests and studies aimed at identifying the indicators most capable of explaining levels of school maturity and predicting children's readiness to learn and adapt to the school environment. In this context, attention has gradually shifted from relying on chronological age as the sole criterion towards focusing on developmental competencies that enable children to integrate successfully into school life. This shift has contributed to the development of a contemporary scientific perspective defining the main dimensions underlying school maturity. (Françoise Estienne, 2018, p.20)

Within the field of psychometrics, the School Maturity Test (TMS) developed by Devillartey (1971) represents one of the pioneering attempts to assess children's readiness for school entry. It was based on a comprehensive assessment of children's cognitive, perceptual, linguistic, and motor abilities, under the assumption that school success is more closely related to functional maturity than to chronological age. This test constituted an important reference for the development of subsequent school readiness measures and contributed to establishing the view of school maturity as a multidimensional construct.

Similarly, the DIAL-R, developed by Carol D. Mardell-Czudnowski and Dorothea S. Goldenberg. (1990), further supported this perspective by providing a battery for the early identification of strengths and weaknesses in children before school entry. It covered language, perceptual, and motor domains and demonstrated through its applications that early assessment makes it possible to identify children at risk of learning difficulties and to guide preventive interventions before the beginning of formal schooling. (Mardell-Czudnowski & Goldenberg, 1990)

The work of Janus and Offord (2007) marked an important development in the study of school maturity through the development of the Early Development Instrument (EDI), which adopted a comprehensive conceptualization of school readiness based on five major domains: physical health and well-being, social competence, emotional maturity, language and cognitive development, and communication skills and general knowledge. This model has become one of the most widely used reference frameworks in international research because of its comprehensive nature and its reliance on measurable developmental indicators capable of predicting school success. (Janus & Offord, 2007)

Subsequent studies have further supported this approach, demonstrating that school maturity is not a single skill but rather the outcome of the integration of linguistic, cognitive, social, emotional, and motor development. In this regard, Lavoie et al. (2008) emphasized that difficulties in any one of these dimensions may negatively affect children's adaptation to school demands, further supporting the importance of adopting a multidimensional approach to the assessment of school readiness. (Goulet et al., 2008)

On the basis of these theoretical and applied foundations, it is now widely recognized in the literature that the assessment of school maturity should rely on a set of integrated developmental indicators rather than being limited to chronological age or a single developmental domain. This perspective guided the development of the present test through the integration of linguistic, cognitive, sensorimotor, and emotional-social dimensions, adapted to the linguistic and cultural characteristics of Algerian children.

Despite the importance of these contributions in identifying the factors underlying school maturity, they also reveal a scientific and applied gap in the Algerian context, namely the absence of a standardized national diagnostic tool developed according to the linguistic, cultural, and social characteristics of Algerian children and capable of comprehensively assessing school maturity before school entry. This situation has contributed to the continued reliance on chronological age as a primary criterion for school entry, or on foreign tests that do not adequately reflect the specific characteristics of the Algerian environment, thereby limiting the accuracy of identifying children at risk of difficulties in adaptation and learning. (Gani & Bara, 2025)

The significance of this issue is further highlighted by educational data reported by Bara Sid Ahmed (2020), which indicate the continued high rates of grade repetition during the first years of primary education. This suggests that a considerable number of children enter school without possessing the minimum level of school maturity required to cope with learning demands. Consequently, there is an urgent need to develop a national multidimensional tool for the early assessment of school maturity, enabling the identification of children's strengths and difficulties before school entry and guiding preventive and remedial interventions. Such an instrument could contribute to improving children's opportunities for school success and reducing grade repetition. (Bara, S.-A., & Adda, D. 2020)

4. Development of the Multidimensional School Maturity Test (TMMS-DZ): From Theoretical Conceptualization to Field Application

The development of the Multidimensional School Maturity Test (TMMS-DZ) arose in response to a practical need identified through speech-language and educational practice in the Algerian context. Field observations and longitudinal studies conducted by Bara Sid Ahmed (2003–2020) revealed clear individual differences among children preparing to enter school, despite their similar chronological ages and comparable educational conditions. These differences were particularly evident in linguistic, cognitive, motor, and emotional development, highlighting the limitations of relying solely on chronological age as an indicator of school readiness and confirming the need for a more comprehensive and objective multidimensional diagnostic tool.

The development of the test was based on an integrative approach combining theoretical evidence with field observations. During the first stage, interviews and direct observations were conducted with children attending preparatory classes in several Algerian educational institutions, with the aim of identifying the indicators most closely associated with school readiness and documenting linguistic, cognitive, and behavioral difficulties that might hinder children's integration into school life. A number of international tests specifically designed to assess school readiness were also examined, together with recent literature in the fields of language development, developmental psychology, and psychometrics.

Based on these findings, four main dimensions were identified as the theoretical structure of the test: the linguistic dimension, the cognitive dimension, the motor dimension, and the psychosocial dimension. Each dimension includes a set of sub-indicators representing the core competencies required for early school success. The linguistic dimension focuses on oral comprehension and expression; the cognitive dimension addresses attention, perception, memory, and concentration; the motor dimension includes gross and fine motor skills and visuomotor coordination; while the psychosocial dimension encompasses school adjustment, emotional stability, and social interaction.

To examine the suitability of the initial version of the test, a pilot study was conducted from February to April 2024 with a sample of 30 children from preparatory classes, selected from socially and culturally diverse backgrounds. This stage aimed to assess the clarity of the instructions, the appropriateness of the illustrations and activities, the time required for administration, and the children's response patterns.

The results of the pilot study revealed clear variations among children across the different domains of school maturity, including linguistic, cognitive, motor, and psychosocial domains. These findings confirmed the presence of substantial individual differences and the need for a multidimensional assessment instrument.

These findings provided the basis for revising the initial version of the test by removing items with weak discrimination, reformulating some instructions, modifying certain visual materials, and adding new items that were more sensitive to individual differences. The instrument was also subjected to scientific expert review by specialists in speech-language pathology, psychology, educational sciences, and psychometrics, which contributed to improving its theoretical and applied properties.

Following the development of the final version through the stages of theoretical construction, scientific expert review, pilot testing, and psychometric analysis, the test was administered to a main sample of 100 children from different geographical regions of Algeria. A stratified sampling method was used to ensure representation of cultural, linguistic, and social diversity. This diversity made it possible to examine the applicability of the instrument across different contexts and to assess its ability to measure school maturity objectively and comprehensively.

This gradual methodological process in the development of the TMMS-DZ reflects an integrated scientific approach combining theoretical analysis, field observation, pilot testing, scientific expert review, and large-scale application. It contributed to the development of a multidimensional diagnostic tool that takes into account the linguistic, cultural, and educational characteristics of Algerian children and provides a rigorous scientific framework for assessing school readiness and predicting readiness for formal learning. (Gani & Bara, 2025)

5. Main Study and Standardization of the Multidimensional School Maturity Test (TMMS-DZ)

5.1 General Framework of the Main Study

As part of the completion of the development and standardization of the Multidimensional School Maturity Test (TMMS-DZ), the main study constituted a critical methodological stage aimed at moving from the initial development phase to the final validation of the instrument for field use. This stage focused on two main objectives. The first was to examine the scientific properties of the test in terms of validity and reliability, thereby ensuring the accuracy and stability of its measurements. The second was to standardize the raw scores and analyze the distribution of school maturity levels within an Algerian sample of children preparing to enter school. This stage was particularly important as it represented a key transition in the research process, whereby the instrument moved from a test under development to a standardized tool suitable for diagnostic and predictive use in the educational context.

5.2 Research Method

The present study adopted a descriptive research method, considered appropriate to the nature of the research topic, which focused on assessing the linguistic and cognitive abilities of children preparing to enter school. This method is based on describing the phenomenon as it occurs in reality, analyzing its characteristics, and interpreting them on the basis of accurate field data, with the possibility of generalizing the findings when the sample is representative of the target population. The descriptive method is one of the most widely used approaches in educational research because of its flexibility and its ability to combine observation with objective analysis of phenomena. In the present study, it was used to administer the School Maturity Test and analyze its results, while ensuring scientific requirements related to objectivity, accurate data collection, and verification of the instrument's scientific properties in terms of validity, reliability, and standardization.

5.3 Study Sample and Its Characteristics

The main study sample consisted of 100 boys and girls enrolled in preparatory classes in primary schools during the 2023–2024 academic year. Their ages ranged from 4 years and 6 months to 6 years and 6 months. The sample was selected using a purposive stratified sampling method, while schools were randomly selected within each geographical region. The sample included children from the eastern, central, western, and southern regions of Algeria, thereby ensuring geographical, social, cultural, and linguistic diversity, particularly in view of the multilingual nature of the Algerian context. The sample also included children enrolled in preparatory classes without excluding cases that might involve difficulties or developmental disorders, in order to reflect the actual educational context. This sampling strategy was intended to enhance the representativeness of the findings, reduce geographical and institutional bias, and examine the ability of the TMMS-DZ to identify individual differences in school maturity across diverse developmental contexts.

5.4 Administration and Application Procedures for the Multidimensional School Maturity Test (TMMS-DZ)

The Multidimensional School Maturity Test (TMMS-DZ) was administered under structured field conditions and according to precise procedures designed to ensure standardized administration across all participants and to minimize the influence of external factors that could affect the validity of the results, such as differences in examiner procedures or variations in the testing environment.

The test was administered individually and directly to each child in a quiet and appropriately prepared space within the educational institution. Particular attention was given to providing comfortable psychological conditions that would encourage the child to interact naturally with the tasks presented. A standardized administration manual was followed, specifying the exact manner in which instructions were presented, the sequence of items, and the recording of responses, thereby ensuring objectivity and consistency in measurement across participants.

The Multidimensional School Maturity Test (TMMS-DZ) comprises four main dimensions reflecting the theoretical structure of school maturity. Its items were arranged progressively to take into account the child's developmental abilities. The linguistic dimension assesses receptive and expressive language through the understanding of instructions, vocabulary, sentence structures, oral expression, and basic linguistic concepts. The cognitive dimension assesses attention, memory, perception, auditory and visual discrimination, classification, and problem-solving. The motor and general health dimension evaluates gross and fine motor skills, visuomotor coordination, and motor control required for school activities. The psychosocial and emotional dimension addresses school adjustment, emotional and social maturity, behavioral regulation, interaction with others, adherence to rules, independence, and self-confidence. An independent scoring scale was assigned to each dimension, in addition to an overall score reflecting the child's general level of school maturity. The items were arranged from the easiest to the most complex in order to ensure accurate and objective measurement and to provide a comprehensive assessment of the child's level of school readiness.

Statistical Analysis

The study employed a set of descriptive and inferential statistical methods, including the analysis of score distributions and individual differences, as well as Spearman's correlation coefficient to examine the relationship between age and school maturity. Validity and reliability indicators were also used to assess the psychometric structure of the test. Thus, the analysis was not limited to describing the results but also aimed to examine the extent to which the test was consistent with its theoretical foundations and underlying conceptual structure.

6. Results of the Psychometric Validation of the Multidimensional School Maturity Test (TMMS-DZ)

The Multidimensional School Maturity Test (TMMS-DZ) underwent a series of psychometric procedures to verify its validity as a measurement instrument. These procedures included the examination of validity, reliability, and internal consistency. An initial standardization of the test was also conducted to establish reference indicators for interpreting children's scores and classifying their levels of school maturity. The validation process demonstrated that the test was based on a multidimensional conceptualization of school maturity encompassing linguistic, cognitive, motor, and psychosocial aspects, in accordance with theoretical foundations and recent research in the field of school readiness.

6.1. Results of Content Validity Assessment

The content validity of the test was established through a review of relevant scientific literature and studies and by comparing its items with selected school readiness assessment instruments. The initial version was subsequently submitted to a group of experts in speech-language pathology, educational psychology, special education, and psychometrics. Their observations contributed to modifying the wording, sequencing, and instructions of some items, thereby ensuring their relevance to the targeted theoretical dimensions and to the linguistic, cultural, and age-related characteristics of Algerian children. This process enhanced the clarity of the instrument and its suitability for administration.

Table 1. Results of Expert Review of the Items of the Multidimensional School Maturity Test

Indicator	Number of experts	Domains reviewed	Items modified	Mean expert rating	**Degree of agreement**
	10	4	3	3	Very high

The results presented in Table 1 indicate a high level of agreement among the experts regarding the validity of the test, with a mean rating of 9.7 out of 10. This value reflects substantial agreement concerning the soundness of the instrument's conceptual structure and its coverage of the various components of school maturity. It also indicates that the selected items adequately represent the essential skills expected to be present in children before entering formal schooling, thereby providing initial evidence of content validity.

6.1.1. Results of Construct Validity Assessment of the Multidimensional School Maturity Test (TMMS-DZ)

Following the assessment of content validity and expert validity, construct validity was examined as one of the main indicators used to determine the extent to which the proposed theoretical structure corresponds to the actual structure of the field data. This procedure aimed to verify that the four dimensions comprising the test—linguistic abilities, cognitive abilities, motor abilities, and psychosocial abilities—contribute coherently to the measurement of the general construct of school maturity.

For this purpose, Pearson correlation coefficients were calculated between the scores of each subdimension and the total test score in a sample of 100 children preparing to enter school.

Table 2. Correlation Coefficients Between the Dimensions of the Multidimensional School Maturity Test and the Total Test Score

Indicator	**Linguistic abilities**	**Cognitive abilities**	**Motor abilities**	**Psychosocial abilities**
Correlation coefficient (r)	0.79	0.85	0.83	0.85
Significance level	0.01	0.01	0.01	0.01

The results presented in Table 2 show high and statistically significant correlations at the 0.01 level between all subdimensions and the total test score. The correlation coefficients ranged from 0.79 to 0.85. The cognitive and psychosocial dimensions showed the highest correlations with the total score ($r = 0.85$), followed by the motor dimension ($r = 0.83$), and then the linguistic dimension ($r = 0.79$). These findings support the theoretical structure of the test and confirm that the four dimensions are interrelated and constitute an integrated framework for assessing school maturity and school readiness.

6.2. Results of the Analysis of Internal Relationships Between the Test Dimensions

The correlations between the test dimensions were examined to determine the extent to which they are related and integrated in measuring a unified concept of school maturity, while preserving the theoretical specificity of each dimension.

Table 3. Pearson Correlation Coefficients Between the Dimensions of the Multidimensional School Maturity Test

Dimensions	Linguistic abilities	Cognitive abilities	Motor abilities	Psychosocial abilities
Linguistic abilities	1	0.733	0.770	0.817
Cognitive abilities	0.733	1	0.856	0.666
Motor abilities	0.681	0.650	1	0.705
Psychosocial abilities	0.701	0.284*	0.632	1

The results revealed a good level of interrelationship among the components of the TMMS-DZ, with correlation coefficients ranging from 0.63 to 0.86. This confirms the relatedness and integration of the components of school maturity. The highest correlation was observed between the cognitive and motor dimensions ($r = 0.856$), reflecting their interaction in children's performance of tasks associated with school readiness. In contrast, the psychosocial dimension showed a relatively lower correlation with the cognitive dimension, while remaining within an acceptable range, confirming its relative specificity. Overall, the findings support the conceptualization of school maturity as an integrated multidimensional construct in which the different components interact while each dimension retains a degree of independence that allows the identification of children's strengths and weaknesses.

6.3. Relationship Between Chronological Age and School Maturity Test Scores

Given that some traditional conceptualizations associate school readiness solely with chronological age, the relationship between children's age and their scores across the different test dimensions was examined using Spearman's correlation coefficient, with the aim of determining the extent to which age alone contributes to explaining individual differences in levels of school maturity.

Table 4. Spearman Correlation Coefficients Between Chronological Age and the Dimensions of the School Maturity Test

Statistical indicator	Language comprehension	Language production	Attention and auditory memory	Visual perception and discrimination	Concentration and processing speed	Gross motor skills	Fine motor skills	Psychological dimension	Social dimension	Total test score
Correlation coefficient (Rho)	0.30	0.20	0.30	0.31	0.20	0.09	0.29	0.16	0.16	0.30
Significance level (Sig.)	0.002	0.002	0.03	0.02	0.09	0.84	0.07	0.10	0.10	0.02

The results showed that the correlations between chronological age and levels of school maturity were generally weak, ranging from 0.09 to 0.31. Moreover, several of these relationships did not reach statistical significance. These findings indicate that increasing age alone is not sufficient to explain individual differences in children's level of school readiness and that other developmental factors contribute to determining the child's ability to cope with school demands.

6.1.4. Summary of Construct Validity Results

The construct validity indicators confirm that the TMMS-DZ has a coherent internal structure, with its dimensions contributing to the measurement of a common construct while each dimension retains its specific characteristics. The weak associations between chronological age and test scores further support the adoption of a multidimensional approach to assessing school readiness rather than relying exclusively on chronological age.

6.2. Results of the Psychometric Reliability Assessment of the Multidimensional School Maturity Test (TMMS-DZ)

The reliability of the TMMS-DZ was examined using three complementary methods: Cronbach's alpha to assess internal consistency, test-retest reliability to examine temporal stability, and split-half reliability to estimate item homogeneity. The use of these complementary approaches provides a more comprehensive assessment of the reliability of the test by examining both the consistency of its items and the stability of its scores over time.

6.2.1. Results of Internal Consistency Using Cronbach's Alpha

Cronbach's alpha coefficients were calculated for the four test dimensions and for the total test score in order to estimate the degree of homogeneity among the items comprising each dimension, using the main study sample.

Table 5. Reliability Coefficients Using Cronbach's Alpha for the Dimensions of the Multidimensional School Maturity Test

Statistical indicator	Linguistic abilities	Cognitive abilities	Motor abilities	Psychosocial abilities	Total test score
Cronbach's alpha coefficient (α)	0.77	0.78	0.71	0.80	0.80
Level of internal consistency	Good	Good	Acceptable	Good	Good

The results showed that Cronbach's alpha coefficients ranged from 0.71 to 0.80 across the subdimensions and reached $\alpha = 0.80$ for the test as a whole, indicating a good level of internal consistency. The psychosocial dimension showed the highest reliability coefficient ($\alpha = 0.80$), whereas the motor dimension showed the lowest value ($\alpha = 0.71$), which nevertheless remained within the acceptable range. These findings confirm the homogeneity of the test items and its reliability in assessing school maturity.

6.2.2. Results of Test-Retest Reliability

To examine the stability of test scores over time, the test-retest method was used. The Multidimensional School Maturity Test was readministered after a two-week interval to a sample of 70 children.

Table 6. Test-Retest Reliability Coefficient of the Multidimensional School Maturity Test

Statistical indicator	Sample size	Time interval between administrations	Correlation coefficient between administrations	Significance level
Value	70 children	Two weeks	0.89	0.01

The test-retest results revealed a high and statistically significant correlation between the scores obtained in the first and second administrations ($r = 0.89$, $p < 0.01$), indicating a high level of temporal stability for the TMMS-DZ and supporting the reliability of its scores and its potential use in diagnostic assessment and follow-up.

6.2.3. Results of Split-Half Reliability

As a further procedure for assessing test reliability, the split-half method was employed by dividing the test items into two equivalent halves and calculating the correlation coefficient between the scores of the two halves, which was subsequently corrected using the Spearman–Brown formula.

Table 7. Results of Split-Half Reliability of the Multidimensional School Maturity Test

Statistical indicator	Sample size	Correlation coefficient between the two halves	Reliability coefficient after Spearman–Brown correction	Significance level
Value	100 children	0.76	0.86	0.01

The results showed that the correlation coefficient between the two halves of the test was 0.76. After applying the Spearman–Brown formula, the reliability coefficient increased to 0.86, indicating a high level of internal homogeneity.

This finding confirms that the test items are distributed in a balanced manner and that both halves of the test measure the same developmental construct with a high degree of agreement.

6.2.4. Summary of Psychometric Reliability Results

The results obtained using the different reliability methods demonstrated good evidence of the reliability of the TMMS-DZ. Internal consistency coefficients ranged from 0.71 to 0.80, the temporal stability coefficient reached $r = 0.89$, while the split-half method yielded a corrected reliability coefficient of 0.86. The convergence of these indicators confirms the consistency and stability of the test and supports the use of its scores to assess school maturity in children preparing to enter school.

6.3. Standardization Results of the Multidimensional School Maturity Test (TMMS-DZ)

Following the completion of the psychometric validation procedures, the TMMS-DZ was standardized in order to establish reference indicators for interpreting scores and classifying levels of school maturity. Standardization was based on an independent sample of 200 children preparing to enter school. The distribution of scores and their statistical indicators were analyzed, after which the children were classified into three levels of school maturity according to their total test scores.

6.3.1. Descriptive Statistical Indicators of the Total Test Score

Table 8. Descriptive Indicators of Children's Scores on the Multidimensional School Maturity Test (Standardization Sample, N = 200)

Statistical indicator	Sample size	Minimum score	Maximum score	Range	Mean	Maximum possible score
Value	200 children	34	93	59	54.95	100

The results showed that the scores of children in the standardization sample ranged from 34 to 93 points, with a mean score of 54.95 points. This distribution indicates substantial variation in levels of school maturity among the participants, reflecting the ability of the test to differentiate between children with different levels of school readiness.

The relatively wide range of scores also indicates that the test does not tend to cluster children within a single level, but rather allows individual differences in competencies related to school readiness to be identified.

6.3.2. Distribution of Children According to Levels of School Maturity

Table 9. Distribution of the Standardization Sample According to Levels of School Maturity (N = 200)

Statistical indicator	Low maturity	Moderate maturity	High maturity	Total
Number of children	34	140	26	200
Percentage (%)	17%	70%	13%	100%

The results presented in Table 9 show that the majority of children in the standardization sample fell within the moderate school maturity level, accounting for 70% of the sample. The remaining children were distributed between the low maturity level (17%) and the high maturity level (13%).

These findings confirm that school maturity is a developmental construct characterized by varying levels of readiness rather than a binary classification. They also demonstrate the ability of the test to identify individual differences among children and to detect groups that may require support or follow-up before entering formal education.

7. General Conclusion

The findings of the study demonstrated that the Algerian Multidimensional School Maturity Test (TMMS-DZ) has good psychometric properties in terms of validity, reliability, and internal consistency, supporting its suitability for assessing school maturity among children preparing to enter school in the Algerian context. The results also revealed clear individual differences across the linguistic, cognitive, motor, and psychosocial dimensions, together with a weak relationship between chronological age and school maturity. These findings indicate that age alone is insufficient to determine a child's school readiness and that multidimensional assessment provides a more accurate basis for the early identification of children's needs and for supporting school readiness.

8. Conclusion

This study represents a scientific and applied contribution to the field of psychometric and educational assessment in Algeria through the development and standardization of the Multidimensional School Maturity Test (TMMS-DZ), adapted to the linguistic, cultural, and educational characteristics of Algerian children. The test adopts a comprehensive approach integrating linguistic, cognitive, motor, and psychosocial dimensions within a single diagnostic instrument. The findings demonstrated good psychometric properties in terms of validity and reliability and showed that school maturity is not determined by chronological age alone, but rather results from the interaction of multiple developmental abilities. This highlights the importance of multidimensional assessment in identifying individual differences and determining each child's strengths and needs.

The practical value of the test lies in its potential use for early screening and speech-language, psychological, and educational assessment, as well as for supporting decisions concerning school readiness and early intervention. Thus, the TMMS-DZ represents an initial step toward providing a national reference assessment tool for school maturity in the Algerian context.

10- Refferances

Bara, S.-A. (2021). Les éléments internes et externes responsables de la réussite scolaire : Étude exploratoire longitudinale réalisée à la wilaya d'Alger. *Timsal n Tamazight, 13*(1), 115–132.

Bara, S.-A., & Adda, D. (2020). L'expérience des écoles privées en Algérie : Étude comparative des capacités cognitives et linguistiques entre des élèves scolarisés au sein de l'école publique et privée. *Revue El-Bahith en Sciences Humaines et Sociales, 12*(2), 805–814. https://doi.org/10.35156/1869-012-002-059

Dionne, G. (2010). *Déterminants de la maturité scolaire : Stratégies préventives*. 23e colloque Passe-Partout, Université Laval.

Duncan, G. J., Dowsett, C. J., Claessens, A., Magnuson, K., Huston, A. C., Klebanov, P., Pagani, L. S., Feinstein, L., Engel, M., Brooks-Gunn, J., Sexton, H., Duckworth, K., & Japel, C. (2007). School readiness and later achievement. *Developmental Psychology, 43*(6), 1428–1446. https://doi.org/10.1037/0012-1649.43.6.1428

Estienne, F. (2018). Le trouble spécifique du langage écrit de l'adulte : Le jeu de piste du bilan. *Rééducation orthophonique, 24*(139), 16–20.

Gani, S., & Bara, S.-A. (2025). *Designing a linguistic-cognitive test to measure school maturity in children preparing to enter school in the Algerian context* [Doctoral dissertation, Mouloud Mammeri University of Tizi-Ouzou]. Supervised by S.-A. Bara.

Goulet, N., Lavoie, S., Boucheron, L., Durand, D., & Laurin, I. (2008). *Enquête sur la maturité scolaire des enfants montréalais : Rapport régional*. Montréal, QC: Gouvernement du Québec, Agence de la santé et des services sociaux de Montréal.

Janus, M., & Offord, D. R. (2007). Development and psychometric properties of the Early Development Instrument (EDI): A measure of children's school readiness. *Canadian Journal of Behavioural Science, 39*(1), 1–22. https://doi.org/10.1037/cjbs2007001

Mardell-Czudnowski, C. D., & Goldenberg, D. S. (1990). *DIAL-R: Developmental Indicators for the Assessment of Learning–Revised*. American Guidance Service.

Sherry, K., & Draper, C. E. (2013). The relationship between gross motor skills and school readiness in early childhood: Making the case in South Africa. *Early Child Development and Care, 183*(9), 1293–1310. https://doi.org/10.1080/03004430.2012.721358