

MULTILEVEL ACADEMIC SURVEY TESTS (MAST)

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MULTILEVEL ACADEMIC SURVEY TESTS (MAST)

Primary Disciplinary Field(s): Educational Psychology, Educational Assessment, Special Education

1. Core Definition

The Multilevel Academic Survey Tests (MAST) constitute a standardized, norm-referenced and criterion-referenced assessment battery specifically designed to measure an individual's academic proficiency in the fundamental areas of reading and mathematics. The design philosophy behind MAST centers on the necessity of generating highly individualized data regarding a student's current functional academic level, rather than merely providing a broad percentile rank. These tests are inherently "multilevel," meaning the assessment tool is structured to appropriately engage students across a wide spectrum of grade and ability levels, ensuring that the items presented are relevant and challenging enough to accurately delineate the boundaries of the child's academic competence.

MAST attempts to generate a comprehensive profile of strengths and weaknesses, allowing educators and clinicians to move beyond simple failure identification toward targeted intervention planning. Unlike many large-scale, high-stakes assessments, the MAST is often utilized in clinical and special education settings where precise diagnostic information is paramount. The fundamental purpose is to examine a child's academic performance by assessing specific skills against established criteria, often enabling the identification of discrepancies between expected performance and actual achievement, which is critical in determining eligibility for specialized educational services.

This assessment instrument is fundamentally defined by its structured approach to measuring academic ability. By focusing on both mathematics and reading, the test covers the two cornerstone skills required for success across the curriculum. The results derived from MAST provide a measurable baseline against which subsequent educational progress can be tracked, making the tool invaluable for both initial evaluation and ongoing monitoring within the educational system, particularly in the United States where it originated.

2. Historical Context and Proponents

The Multilevel Academic Survey Tests were initially proposed and developed by a team of U.S. educators: **Kenneth W. Howell**, **Staley H. Zucker**, and **Mada K. Morehead**. This development took place in **1985**, a period marked by increasing complexity in educational assessment and a growing focus on the needs of students requiring tailored educational plans, particularly those in special education or remedial programs. The context of the mid-1980s highlighted a need for assessment instruments that were more flexible than traditional, single-level standardized tests,

capable of providing detailed, prescriptive information rather than just summary scores.

The work of Howell, Zucker, and Morehead reflected a shift toward assessment tools that could bridge the gap between initial identification and practical instructional planning. Their goal was to create a tool that not only identified *what* a student knew but also provided reliable data on *how far* a student had progressed toward specific instructional objectives. This focus aligned strongly with the burgeoning movement of curriculum-based measurement (CBM), emphasizing assessments that were tied directly to the skills taught in the classroom curriculum, thus making the assessment data actionable for teachers.

The creation of MAST represents a significant contribution to the field of educational diagnostics, offering a systematic way to survey academic skills across diverse age groups using a common framework. The longevity of the underlying principles--multilevel surveying and criterion-based evaluation--demonstrates the early success of the proponents in addressing the need for adaptable and precise academic measurement tools in clinical and educational settings.

3. Key Characteristics and Structure

A defining feature of the Multilevel Academic Survey Tests is the strategic deployment of three separate tests. While the exact nomenclature or focus of these three tests may vary slightly depending on the specific edition or implementation manual, the structural principle remains constant: they are designed to work synergistically to provide a complete picture of the student's ability, moving sequentially from broad screening to detailed diagnostics. This three-part structure is essential to its "multilevel" claim, as it ensures adequate sampling of performance across various skill levels.

The inherent criterion used in these tests means that performance is not judged relative to the performance of peers (norm-referencing alone), but rather against a predetermined set of instructional objectives or skills (criterion-referencing). This allows the educator to determine if the student has mastered a specific skill set--for example, the ability to decode two-syllable words or solve equations involving fractions--regardless of how other students performed on the same test. The reliance on this specific criterion helps to pinpoint areas where intervention is most urgently required.

The assessment's design necessitates that the items cover a broad range of difficulty, enabling accurate placement of students who may be performing significantly above or below their chronological grade level. The multilevel nature allows for effective surveying across elementary and secondary school academic abilities, ensuring that the test does not suffer from "floor effects" (where low-ability students score zero) or "ceiling effects" (where high-ability students score perfectly without the test truly measuring the limit of their skill).

4. Targeted Academic Domains

MAST specifically focuses on the core academic domains of **reading** and **mathematics**, recognizing these as foundational pillars of educational success and indicators of overall cognitive function related to schooling. The assessment is structured to evaluate performance within several sub-domains of these two subjects, moving beyond simple total scores to provide granular data on specific processes.

In the domain of reading, the tests typically assess competencies such as **decoding skills**, **reading fluency**, and **reading comprehension**. For younger students or those with specific learning challenges, the assessment might focus heavily on phonological awareness and basic sight word recognition. For older students, the focus shifts to complex inferential comprehension, vocabulary knowledge, and the ability to process academic texts efficiently. The multilevel nature ensures that the reading material presented is suitable for the student's assessed instructional level.

Similarly, the mathematics domain assesses a comprehensive range of quantitative abilities, generally spanning areas such as **computation skills** (arithmetic operations), **mathematical reasoning**, and **problem-solving applications**. The test items progress systematically from basic number sense and counting to increasingly complex topics like algebra, geometry, or advanced data interpretation. By breaking down performance into these measurable sub-skills, MAST aids in identifying specific areas of mathematical deficit, distinguishing, for instance, between a computational error and a fundamental misunderstanding of the underlying mathematical concept.

5. Applications and Utility in Educational Planning

The primary application of the Multilevel Academic Survey Tests lies in its utility as a diagnostic and planning tool within the special education and remedial education infrastructure. Because MAST yields criterion-referenced data, it is highly effective for informing the development of individualized educational programs (IEPs) or other targeted intervention strategies. The precise identification of skills mastered and skills lacking allows educators to formulate realistic and measurable annual goals for students.

Furthermore, MAST serves as an excellent instrument for **pre-referral screening**. When a student is struggling academically, the administration of a MAST battery can quickly confirm whether the difficulty is localized to a specific academic skill or represents a more global deficit, thereby guiding the decision regarding further psychological or psychoeducational evaluation. Its multilevel design minimizes the chances of misclassifying a student due to an inappropriate level of testing.

Beyond initial diagnosis, MAST is frequently employed for **progress monitoring**. By administering comparable forms of the tests periodically throughout the school year, educators can objectively

measure the effectiveness of the instruction or intervention being provided. If a student shows insufficient growth on the MAST criteria, the educational team is prompted to revise the instructional methodology, ensuring accountability and responsiveness in the educational process.

6. Psychometric Properties

As a standardized assessment, the utility of MAST rests heavily upon its robust psychometric properties, specifically **reliability** and **validity**. Reliability refers to the consistency of the measurement--the assurance that the test results would be similar if the test were administered again under the same conditions. Given the diagnostic stakes associated with these tests, high internal consistency reliability and test-retest reliability are critical to ensure that placement or intervention decisions are stable and not based on random error.

Validity, the second essential psychometric component, ensures that the test actually measures what it purports to measure--academic skills in reading and mathematics. For MAST, this involves demonstrating several types of validity. **Content validity** ensures that the test items adequately sample the relevant domain of skills taught in school curricula. **Concurrent validity** demonstrates that the scores align reasonably with other established measures of academic achievement. Crucially, **predictive validity** may be assessed to confirm that MAST scores accurately predict future academic success or performance in related tasks.

The multilevel structure itself demands specialized psychometric modeling, often utilizing Item Response Theory (IRT) or similar frameworks, to ensure that scores are comparable across different test forms and different levels of difficulty. This rigorous statistical framework is necessary to maintain the integrity of the criterion-referenced interpretation, allowing comparison of skill mastery independent of the specific test form administered.

7. Further Reading

[Educational Assessment \(General Principles\)](#) - Wikipedia

[Criterion-Referenced Test](#) - Wikipedia

Howell, K. W., Zucker, S. H., & Morehead, M. K. (1985). Development and initial validation of the Multilevel Academic Survey Tests (MAST). Research in Special Education Publication.