Pearson Clinical Assessment Solutions:
A Dyslexia Toolkit

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Pearson Clinical Assessment offers a dyslexia toolkit with resources for screening, identification, intervention, and progress monitoring. This report will be updated periodically as new tools become available.

When reviewing this white paper, please consider the following important notes:

- Identifying individuals with dyslexia is a multi-step process, between screening and assessment. Similarly, supporting individuals who are at-risk or who have dyslexia is not a "quick fix" and may require layers of effort from simple accommodations to special education intervention.
- Local processes and procedures across the US (and globally) vary greatly within the dyslexia context. Tool choices, and each tool's appropriate use, must be considered carefully against the available scientific evidence and best practices in educational and clinical contexts.
- Each resource in this toolkit shows strong empirical evidence on its own. The power of a toolkit comes from understanding the need for multiple tools and how they fit together to guide clear decision-making, giving the collective effort additional power. Clear data, a sufficient knowledge base, and team-based decision-making allow the best path forward.

Understanding Dyslexia

The International Dyslexia Association (IDA) established the following definition of dyslexia in 2002, which has since been adopted by many U.S. federal and state agencies:

> Dyslexia is a specific learning disability that is neurobiological in origin. It is characterized by difficulties with accurate and/or fluent word recognition and by poor spelling and decoding abilities. These difficulties typically result from a deficit in the phonological component of language that is often unexpected in relation to other cognitive abilities and the provision of effective classroom instruction. Secondary consequences may include problems in reading comprehension and reduced reading experience that can impede growth of vocabulary and background knowledge.[16]

In 2015 a unanimous Senate vote for the Cassidy-Mikulski Resolution (Resolution 275)[32a] called on Congress, schools, and State and local educational agencies to recognize the significant educational implications of dyslexia that must be addressed. Then in 2016, the U.S. Senate voted unanimously as part of the Cassidy Senate Resolution 576[32b] to establish the following definition of dyslexia:

> (1) an unexpected difficulty in reading for an individual who has the intelligence to be a much better reader; and (2) most commonly due to a difficulty in phonological processing (the appreciation of the individual sounds of spoken language), which affects the ability of an individual to speak, read, spell, and often, learn a second language.[32b]

Both definitions refer to the unexpected nature of dyslexia, which is often revealed by an uneven cognitive profile in which basic skill deficits are surrounded by a "sea of strengths" in areas such as reasoning, problem solving, vocabulary, and listening comprehension.[34]

Prevalence estimates suggest that up to 20% of the population show symptoms of dyslexia.[9, 17] Dyslexia is a language-based reading disorder that typically results in lifelong impact to an individual. Diagnosis of dyslexia can be made through medical or educational processes.

Many professional and parent groups—including parents, psychologists (school, clinical), speech-language pathologists, educational diagnosticians, reading specialists, general and special education teachers, school administrators, and government stakeholders—support individuals with dyslexia in a variety of ways. Collaboration among these groups is key to facilitating a productive, robust, evidence-based assessment and intervention plan.

A Hybrid Model of Dyslexia Identification

Implementing an evidence based process for dyslexia screening, identification, intervention, and progress monitoring is paramount to improving student outcomes. The tests and products recommended in this toolkit are designed to be used most effectively within a comprehensive framework such as a hybrid model for dyslexia identification. Approaches to identification that rely on a single criterion are prone to measurement error and show poor stability over time.[19, 20] In contrast, a hybrid model incorporates multiple sources of information, as well as the degree to which the student has responded to treatment. Students who do not respond to high quality instruction may be more likely to have an underlying cognitive deficit that manifests as dyslexia. For this reason, incorporating treatment response data as one essential criterion for dyslexia reduces false positives, improves stability of classification over time, and signals that the reading problem is persistent and not due to inadequate instruction.[13, 38] The hybrid model shown in Figure 1 summarizes the symptoms, causes and correlates, and risk factors that may be considered as part of a dyslexia evaluation.

Symptoms

Before the onset of formal schooling, parents or caregivers may observe early risk factors for dyslexia. For example, some children with dyslexia begin speaking later than most other children, have problems with pronunciation, or use vague terms because they have difficulty recalling the specific word for an object.[34]

The symptoms of dyslexia are most commonly observed at school or during reading and writing tasks. Before learning to read, children with dyslexia may exhibit difficulties with alphabet writing, letter identification, and/or phonics (letter-sound correspondence).[3] After exposure to reading instruction, individuals with dyslexia may have difficulties with decoding pseudowords, word reading, reading fluency (oral reading fluency, in particular), spelling, and written expression. In addition, reading comprehension is relatively poor compared to listening comprehension among individuals with dyslexia.[38]

Collecting information about the examinee's educational history, including any accommodations, services, and specialized instruction received, is important for ruling out insufficient instruction as a primary cause of academic difficulty. Poor response to instruction is considered an important symptom for identifying individuals with dyslexia because it indicates that the individual's difficulties cannot be attributed to lack of appropriate instruction.[38] However, poor treatment response is not sufficient on its own to reliably identify dyslexia because students may fail to respond to instruction for a number of reasons such as intellectual disability and socioemotional problems.

An individual with dyslexia may not exhibit every symptom at a given point in time, and his or her areas of weakness may change over time. To improve the stability of dyslexia identification and reduce the likelihood that a student will qualify one year and not the next, some researchers recommend a criterion of n or more (e.g., 3 or more, or 4 or more) symptoms, requiring that poor treatment response is one of those symptoms.[38]

Evaluators are advised to assess other skill areas as well to identify additional areas of strength and weakness in the individual's learning profile. For example, assessing skill levels in the areas of math (computation, problem solving, and fluency) is recommended because a subset of individuals with dyslexia experience math difficulties as well.[18] In addition, assessing vocabulary and grammar (morphological-syntactic) skills is important for understanding whether a more pervasive oral and written language disorder may be contributing to literacy difficulties.[3, 37]

Causes/Correlates

The causes and correlates of dyslexia include areas of cognitive processing weaknesses, which are less easily observed than symptoms. The symptoms of dyslexia are typically either attributed to or related to weaknesses in one or more of the following areas: phonological processing (including phonological awareness and phonological coding), rapid automatic naming (the phonological loop of working memory), auditory verbal working memory, processing speed, long-term storage and retrieval, associative memory, and orthographic processing. Assessing the first three areas is considered paramount for a dyslexia evaluation according to the IDA guidelines.[18]

Although weaknesses in one or more aspects of phonological processing are often associated with dyslexia,[18] a single cognitive deficit cannot adequately explain the symptoms of dyslexia in all cases.[30] Rather, the causes of dyslexia are likely multiple, interacting, and probabilistic.[29] For this reason, a hypothesis-testing approach to assessment that explores multiple causes and correlates is helpful for understanding an individual's overall learning profile.

Risk Factors

Considering hereditary and correlated risk factors for dyslexia alongside behavioral symptoms supports a more robust model of dyslexia identification.[38] In addition to low scores on a dyslexia screening test, the risk factors for dyslexia involve aspects of an individual's family history and developmental history, which are typically assessed through self or parent report. Individuals with the following characteristics are at increased risk for dyslexia: a family history of dyslexia,[39] a history of language impairment and/or weaknesses in receptive vocabulary.[37] Most individuals with dyslexia have at least age appropriate receptive vocabulary and general language skills; however, vocabulary weaknesses may be seen in conjunction with a specific language disorder or as a correlate of dyslexia if individuals spend less time engaged in reading and language activities.[10, 18, 37]

Possible Strengths

Many individuals with dyslexia exhibit relative strengths in areas such as fluid reasoning and problem solving, oral language (including listening, speaking, vocabulary, and grammar), and math.[34] These strengths may be identified and highlighted during the course of a dyslexia evaluation using a hybrid model approach to assessment. For intervention purposes, strategies and methods that utilize an individual's cognitive processing strengths for remediating weaknesses is preferred.[31]

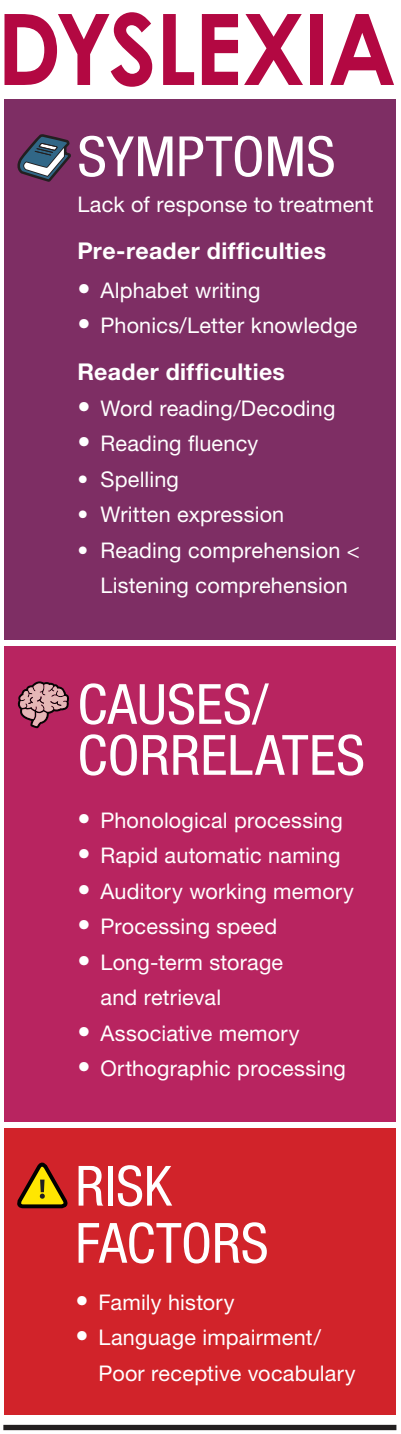

Figure 1. Hybrid Model of Dyslexia Identification

Pearson Dyslexia Toolkit

The Pearson dyslexia toolkit includes clinical assessments and resources for screening, diagnostic evaluations, intervention, and progress monitoring. To assist the varied groups of professionals who support individuals with dyslexia, this toolkit is inclusive of tools used across professional groups and user qualification levels.

Screening Tools

The Pearson toolkit for dyslexia screening includes the following measures:

- Shaywitz DyslexiaScreen™
- Wide Range Achievement Test, fifth edition (WRAT5™)
- Kaufman Test of Educational Achievement, third edition (KTEA™–3), Brief Form
- Dyslexia Index scores, newly developed for the KTEA–3 Comprehensive Form and the Wechsler Individual Achievement Test®, third edition (WIAT®–III)

Table 1 summarizes the reliability coefficients, clinical validity data, and administration time for these dyslexia screening measures. The industry standard criterion for evaluating the quality of a screening instrument is the Area Under the Curve (AUC) estimate, which is the area under the Receiver Operating Characteristic (ROC) curve. Traditional benchmarks suggest that values ≥ 0.9 are excellent, ≥ 0.8 are good, ≥ 0.7 are fair, and < 0.7 are poor. The AUC estimates for the dyslexia screening tools in Table 1 range from .81 to .93, indicating that the screeners have good-to-excellent accuracy in separating children at risk for dyslexia from those not at risk.

The **Shaywitz DyslexiaScreen**[35] is a brief teacher survey for identifying students at risk for dyslexia. This assessment is intended for use with students experiencing academic difficulties but can also be used to screen all students. Teachers can complete the Shaywitz DyslexiaScreen for a student in less than 5 minutes, using an online form. Digital administration and scoring in Q-global or the Universal Screening application provides evaluators with immediate results and reporting capabilities for individuals and groups of students. The classification accuracy data indicate moderately high sensitivity and specificity for all forms. Clinical validity data indicate that the Shaywitz DyslexiaScreen correctly classified 71% of kindergarten students, 80% of first-grade students, and 75% of second-grade students.[36]

The **WRAT5**[47] is a widely used screening test of reading, spelling, and math skills in individuals ages 5–85+ years (grades K–12+). This test includes four subtests (Word Reading, Sentence Comprehension, Spelling, and Math Computation) and one Reading composite, all of which can be administered in about 20–30 minutes. Examiners have the flexibility to administer a single subtest or any combination of the four subtests.

The **KTEA–3 Brief Form**[24] is used to screen for weaknesses in reading, writing, and mathematics, and to obtain a general estimate of academic achievement for grades PK–12+ (ages 4–25). The three-subtest Brief Achievement (BA-3) composite for grades K–12+, which includes measures of word reading, spelling, and math computation, is especially useful for this purpose. Results may be used to identify students who need a comprehensive evaluation. To obtain more complete information across all three academic areas, three additional subtests are administered and the scores are combined with the three subtest scores from the BA-3 to yield the student's Academic Skills Battery (ASB) composite. The subtests used in the ASB also provide domain composites in Reading, Math, and Written Language. If the results from the ASB or domain composites suggest the need for further testing, administration of the KTEA–3 Comprehensive Form is recommended. The Comprehensive Form includes supplemental subtests that are useful for exploring specific aspects of academic functioning. All standard scores from subtests administered using the Brief Form can be applied to either Form A or Form B of the KTEA–3 Comprehensive.

The **KTEA–3 and WIAT–III Dyslexia Index Scores** are ideal for screening purposes due to their brief administration time and clinical sensitivity; however, these index scores are also sufficiently rigorous to contribute to a more comprehensive

diagnostic evaluation. The technical and normative tables for the KTEA–3 and WIAT–III Dyslexia Index scores are available in the Essentials of KTEA–3 and WIAT–III Assessment.[5] Evaluators without access to this resource may also generate a brief dyslexia screening battery by administering the subtests that contribute to these index scores and interpreting the level and profile of scores.

As explained by Breaux and Lichtenberger, the KTEA–3 Dyslexia Index and the WIAT–III Dyslexia Index are considered highly reliable and theoretically sound. However, there are some key differences to consider. For grades K–1, the KTEA–3 index includes a measure of rapid automatic naming and a subtest devoted only to phonological processing, whereas the WIAT–III index includes a measure of the orthographic loop (early spelling of phonemes and words). For grades 2–12+, both the KTEA–3 and WIAT–III indexes include measures of pseudoword decoding and spelling. However, the KTEA–3 index also includes a measure of oral word reading fluency, whereas the WIAT–III index includes a measure of oral passage reading fluency.[5]

Table 1. Technical Characteristics of Dyslexia Screening Measures

Test or index score	Grade/ Age	Subtests/Items	Mean reliability	Effect size	AUC	Administration time (min.)
Shaywitz DyslexiaScreen™: Form 0	Kindergarten	10 items	.87	1.48	.81	< 5
Shaywitz DyslexiaScreen™: Form 1	1	12 items	.90	0.96	.89	< 5
Shaywitz DyslexiaScreen™: Form 2	2	10 items	.92	1.47	.92	< 5
WRAT5: Reading Composite	1–12+ Ages 6–89+	Word Reading + Sentence Comprehension	.96	1.70	.89	10–20
KTEA™–3 Brief: BA-3 composite	K–12+ Ages 5–25	Letter & Word Recognition + Spelling + Math Computation	.98	2.11	.93	20
KTEA™–3 Comprehensive Dyslexia Index 1	K–1	Phonological Processing + Letter Naming Facility + Letter & Word Recognition	.92	1.79	.90	20
KTEA™–3 Comprehensive: Dyslexia Index 2	2–12+ Ages 7–25	Word Recognition Fluency + Nonsense Word Decoding + Spelling	.97	1.76	.89	15
WIAT®–III Dyslexia Index 1	K–1	Early Reading Skills + Spelling	.94	1.66	.88	12
WIAT®–III Dyslexia Index 2	2–12+ Ages 7–25	Oral Reading Fluency + Pseudoword Decoding + Spelling	.98	1.84	.90	15

Note. AUC = Area Under the Curve estimate. Data for KTEA–3, WIAT–III, and WRAT5 were derived from age-based standard scores. Alpha reliability is reported for the Shaywitz DyslexiaScreen forms; split half reliability is reported for all other tests. All scores from the dyslexia groups were significantly ($p < .01$) lower than those of the nonclinical matched control groups. Clinical *n*-counts for the KTEA–3 and WIAT–III Dyslexia Index scores at grades K–1 were insufficient (< 20) for group comparisons; for this reason, group means, effect sizes, and AUC estimates for the Dyslexia Index 1 scores were based on a sample of students in grades 1–4, ages 6–10.

Diagnostic Assessment Tools

The Pearson toolkit for dyslexia evaluations includes four diagnostic achievement tests:

- Kaufman Test of Educational Achievement™, third edition (KTEA™–3) Comprehensive Form
- Process Assessment of the Learner, second edition: Diagnostics for Reading and Writing (PAL–II Reading and Writing)
- Wechsler Individual Achievement Test®, third edition (WIAT®–III)
- Woodcock Reading Mastery Tests, third edition (WRMT™–III)

Table 2 summarizes the key features of the KTEA–3 Comprehensive Form, PAL–II Reading and Writing, WIAT–III, and WRMT–III.

Table 2. Key Features of Diagnostic Achievement Tests

Key features	KTEA™–3	PAL™–II	WIAT®–III	WRMT™–III
Publication date	2014	2007	2009	2011
Grade and age ranges	Grades PK–12 Ages 4–25	Grades K–6	Grades PK–12 Ages 4–50	Grades K–12 Ages 4–79
Forms	2 parallel forms	1 form	1 form	2 parallel forms
Reading/writing subtests with error analysis	Phonological Processing Reading Comprehension Letter & Word Recognition Nonsense Word Decoding Spelling Written Expression	–	Early Reading Skills Reading Comprehension Word Reading Pseudoword Decoding Spelling	Phonological Awareness Passage Comprehension Word Identification Word Attack Oral Reading Fluency
Administration and scoring options	Hand score Q-global Q-interactive	Hand score	Hand score Q-global Q-interactive	Hand score Q-global

The **KTEA–3 Comprehensive Form**[22] is designed to provide information about normative as well as personal strengths and weaknesses in reading, writing, math, oral language, and key processing areas relevant to dyslexia. The KTEA–3 assessment information may be used to make eligibility, placement, and diagnostic decisions, plan intervention, and monitor progress over time. The clinical validity data reported in the manual[23] indicate that, with the exception of Associational Fluency, all subtest and composite scores for the dyslexia (SLD-reading/writing) group were significantly ($p < .01$) lower than those of the matched control group with large effect sizes. Although the dyslexia group scored significantly lower than the control group across nearly every academic measure, mean scores for the dyslexia group were lowest (below 85) on the reading, reading-related, and spelling subtests.

The **PAL–II Reading and Writing**[2] is designed to measure reading and writing skills and related processes in order to facilitate the differential diagnosis of dyslexia, dysgraphia, and oral and written language learning disability (OWL-LD) and to link assessment results with interventions. The PAL–II, which is often used to complement an evaluation that includes the KTEA–3, WIAT–III, or WRMT–III, is ideal for pinpointing why a student struggles in reading and/or writing.

The **WIAT–III**[27] provides information about normative strengths and weaknesses in reading, math, written expression, and oral language. Results obtained from the WIAT–III can be used to inform decisions regarding eligibility for educational services, educational placement, or a diagnosis of a specific learning disability, and design instructional objectives and plan interventions. According to the clinical validity data reported in the manual,[28] with the exception of Alphabet Writing Fluency, all subtest and composite scores for the dyslexia (SLD-reading/writing) group were significantly ($p < .01$) lower than those of the matched control group. Effect sizes were large for all reading and writing subtests except those for Alphabet Writing Fluency and Essay Composition, which were small and moderate, respectively. The dyslexia group scored the lowest (below average) with the largest differences from the matched control group on the following six subtests: Early Reading Skills, Reading Comprehension, Word Reading, Pseudoword Decoding, Oral Reading Fluency (Fluency, Accuracy, and Rate scores), and Spelling. Similarly, the dyslexia group scored the lowest on the following five composites: Total Reading, Basic Reading, Reading Comprehension and Fluency, Written Expression, and Total Achievement.

The **WRMT–III**[49] provides a comprehensive battery of tests that measure reading readiness and reading achievement for the purpose of developing tailored intervention programs. According to the clinical validity data reported in the manual,[50] the mean scores for the dyslexia group were significantly ($p < .01$) lower than those of the matched control group for all scores except Rapid Automatic Naming: Number and Letter Naming. All effect sizes were large except those for Rapid Automatic Naming: Number and Letter Naming and Listening Comprehension, which were moderate.

Table 3 lists the key skill areas recommended for dyslexia assessment by the International Dyslexia Association,[18] as well as secondary areas that are important to consider, and the relevant measures provided by the KTEA–3, PAL–II, WIAT–III, and WRMT–III. The measures listed include subtests, subtest component scores, supplemental scores, and error analysis classifications.

Table 3. Content Coverage of Diagnostic Achievement Tests

Key areas for dyslexia assessment	KTEA™–3 grades PK–12 ages 4–25	PAL™–II grades K–6	WIAT®–III grades PK–12 ages 4–50	WRMT™–III grades K–12 ages 4–79
Phonics skills/ Letter knowledge	Letter & Word Recognition Letter Naming Facility Letter Checklist	Letters	Early Reading Skills Skills Analysis (SA): Naming Letters; Letter–Sound Correspondence	Letter Identification
Decoding pseudowords	Nonsense Word Decoding	Pseudoword Decoding	Pseudoword Decoding	Word Attack
Word reading	Letter & Word Recognition		Word Reading	Word Identification
Reading fluency	Word Recognition Fluency Decoding Fluency Silent Reading Fluency	RAN-Words Morphological Decoding Fluency Sentence Sense	Oral Reading Fluency Pseudoword Decoding Speed Word Reading Speed	Oral Reading Fluency
Spelling	Spelling	Word Choice	Spelling	
Written expression: sentence level; paragraph level	Written Expression Writing Fluency	Sentences: Writing Compositional Fluency Expository Note Taking and Report Writing	Sentence Composition Essay Composition	
Receptive vocabulary	Reading Vocabulary	Are They Related?	Listening Comprehension: Receptive Vocabulary	Word Comprehension
Rapid naming	Object Naming Facility Letter Naming Facility	RAN-Letters RAN-Letter Groups		Rapid Automatic Naming
Phonological awareness	Phonological Processing	Rhyming Syllables Phonemes Rimes	Early Reading Skills SA: Phonological Awareness	Phonological Awareness
Auditory working memory (phonological memory)	Phonological Processing Error Analysis: Blending	Sentences: Listening Letters Words	Oral Expression: Sentence Repetition Early Reading Skills SA: Blending Sounds	
Secondary areas				
Reading comprehension	Reading Comprehension	Sentence Sense Accuracy score	Reading Comprehension	Passage Comprehension
Listening comprehension	Listening Comprehension	Sentences: Listening	Listening Comprehension: Oral Discourse Comprehension	Listening Comprehension
Orthographic processing	Orthographic Processing composite	Receptive Coding Expressive Coding Word Choice		
Grammatical Ability	Oral Expression	Does It Fit? Sentence Structure	Oral Expression	

Assessment of Intellectual Functioning

The Pearson toolkit for dyslexia evaluations also includes tests of intellectual functioning. Within the context of a dyslexia evaluation, tests of intellectual functioning are used for the following purposes:

- To identify dyslexia using a pattern of strengths and weaknesses (PSW) approach, whereby individuals with dyslexia show consistency between areas of cognitive processing weakness and academic weakness coupled with a significant discrepancy between areas of cognitive processing strength and cognitive processing weakness.[14, 15]
- To develop individualized approaches to intervention that consider areas of processing weakness as well as cognitive strength.[25]
- To facilitate the differential diagnosis of dyslexia, developmental disability, and a more pervasive language impairment, which involves the assessment of overall cognitive ability, verbal reasoning, and nonverbal reasoning.[33, 1]
- To identify students with complicated learning profiles, such as gifted students with dyslexia, and better understand their unique learning profile and needs.[18]

The Wechsler Intelligence Scale for Children®, fifth edition[42] (WISC®–V; Wechsler, 2014) is one of the most commonly used school-age tests of intellectual functioning. The WISC–V is linked with the WIAT–III and the KTEA–3, and includes measures that differentiate individuals with dyslexia (SLD-R) from matched controls. The clinical validity data reported in the manual[43] indicate significant difficulties among the dyslexia group with immediate paired associate learning, naming speed, verbal comprehension, and working memory. The mean scores for the dyslexia group were significantly ($p < .01$) lower than those of the matched control group for all primary index scores except the Processing Speed Index ($p < .05$), with largest effect sizes observed for the Working Memory Index (WMI) and the Verbal Comprehension Index (VCI). Mean standard scores ($M = 100$, $SD = 15$) for the dyslexia group ranged from 89 to 93 on the primary index scores. All global composites had large effects as well. Table 4 summarizes the key cognitive processing areas measured by the WISC–V that may be impaired for individuals with dyslexia.

Table 4. WISC–V Measures of Key Cognitive Processing Areas for a Dyslexia Evaluation

Cognitive processing area	WISC®–V index score
Auditory working memory (phonological memory)	Auditory Working Memory Index (AWMI)
Rapid automatic naming	Naming Speed Index (NSI)
Verbal comprehension and reasoning	Verbal Comprehension Index (VCI)
Processing speed	Processing Speed Index (PSI)
Long-term storage and retrieval	Storage and Retrieval Index (SRI)
Associative memory (learning efficiency)	Symbol Translation Index (STI)

Other Pearson tests of intellectual functioning and cognitive abilities that may contribute to a dyslexia evaluation include the Differential Ability Scales™, second edition[8] (DAS™–II); the Kaufman Assessment Battery for Children, second edition[21] (KABC™–II); NEPSY®, second edition[26] (NEPSY®–II); the Wechsler Adult Intelligence Scale®, fourth edition[40] (WAIS®–IV); the Wechsler Preschool and Primary Scale of Intelligence, fourth edition[41] (WPPSI®–IV); and the Wechsler Nonverbal Scale of Ability[44] (WNV®).

A linking study is conducted by administering a diagnostic achievement test and a cognitive ability test to the same group of examinees for the purpose of reporting correlations between their scores. These studies provide the necessary data

for conducting an ability-achievement discrepancy (AAD) or a pattern of strengths and weaknesses (PSW) analysis for the identification of a specific learning disability such as dyslexia. Table 5 summarizes the cognitive ability linking studies available for the two comprehensive achievement tests included in the dyslexia toolkit: KTEA–3 and WIAT–III.

The WRMT–III uses the AAD predicted-difference method in its approach to comparing intellectual ability to academic achievement. WRMT–III reading achievement scores are predicted from broad-based intellectual functioning measures (e.g., Full Scale IQ, General Ability Index), verbal-based measures (e.g., Verbal Comprehension Index, VCI), and nonverbal-based measures (e.g., Nonverbal Index, NVI).

Table 5. Cognitive Ability Linking Studies

Cognitive ability test	KTEA™–3	WIAT®–III
WISC®–V	X	X
WPPSI®–IV		X
WAIS®–IV		X
DAS™–II	X	X
KABC™–II	X	
WNV®		X

Assessment of Oral Language Skills

The Pearson toolkit for dyslexia diagnostic evaluations also includes tests of oral language. Within the context of a dyslexia evaluation, tests of oral language are used for the following purposes:

- To establish oral language skills as either a protective factor or a risk factor in dyslexia screening[6]
- To develop individualized approaches to intervention that consider areas of oral language weakness and strength[6]
- To facilitate the differential diagnosis of dyslexia, developmental disability, and a more pervasive language impairment such as oral and written language learning disability (OWL-LD)[1, 6]

The Clinical Evaluation of Language Fundamentals®, fifth edition (CELF®–5)[45] provides a comprehensive battery of tests for language assessment, including measures of oral language and written language (reading, writing). The CELF–5 is designed primarily to identify and provide follow-up evaluations for language and communication disorders in students. In addition, the CELF–5 may be used to assess several language areas that are relevant to a dyslexia evaluation. Table 6 lists the CELF–5 measures that may be used to assess some of the key skill areas recommended for dyslexia evaluations by the International Dyslexia Association[18] as well as secondary areas that are important to consider. Results support the development of an Individualized Education Program that takes into account the student's communication needs and for planning interventions in accordance with the Individuals with Disabilities Education Improvement Act (IDEA) Amendment of 2004. According to the clinical validity data reported in the technical manual,[46] students diagnosed with a learning disability in reading and/or writing scored significantly ($p < .05$) lower on nearly all tests and composites, with the exception of the Sentence Comprehension test, as compared to students with typical language skills. With the exception of the Pragmatics Profile (effect size .40), score differences for all tests showed medium to large effect sizes, ranging from .62 to 1.20.

Table 6. CELF®–5 Measures of Key Language Areas for a Dyslexia Evaluation

Language Area	CELF®–5 Test
Auditory working memory (phonological memory)	Recalling Sentences
Receptive Vocabulary	Linguistic Concepts Word Classes Word Definitions
Written Expression	Structured Writing
Secondary Areas	
Listening Comprehension	Following Directions Semantic Relationships Sentence Comprehension Understanding Spoken Paragraphs
Reading Comprehension	Reading Comprehension
Grammatical Ability	Formulated Sentences Recalling Sentences Sentence Assembly Word Structure

Other Pearson tests of oral language skills that may contribute to an interdisciplinary dyslexia evaluation process include the Auditory Skills Assessment[11] (ASA™); the Expressive Vocabulary Test, second edition[48] (EVT™–2); the Oral Language Acquisition Inventory, second edition[12] (OLAI-2); and the Peabody Picture Vocabulary Test™, fourth edition[7] (PPVT™–4). The use of these tools by a speech-language pathologist or similarly trained professional may support team decision-making in a differential diagnosis, profile of strengths and weaknesses, and intervention planning.

Intervention Tools

The Pearson dyslexia toolkit for intervention includes the following resources:

- Intervention Guide for Learning Disability (LD) Subtypes
- Process Assessment of the Learner (PAL™) Research-Based Reading and Writing Lessons
- KTEA–3 teaching objectives and intervention statements
- WIAT–III intervention goal statements

The **Intervention Guide for LD Subtypes**, which is accessible through Q-global and Q-interactive (see PearsonClinical.com), compares an examinee's skill level profile with the theoretical profiles of specific LD subtypes. Then, provides a report with tailored, research-supported intervention suggestions. Students may benefit from the interventions provided in the report regardless of whether or not they have been identified or diagnosed with dyslexia. Information about the student's cognitive processing, language, and achievement skills may be obtained from assessments in Q-global or Q-interactive; however, other test results as well as qualitative data are also considered. Seven reading-related subtypes are supported, including phonological dyslexia, orthographic dyslexia, and mixed phonological-orthographic dyslexia. The following examples of intervention suggestions were provided by the Intervention Guide for a student, Jeanette, with a learning profile consistent with phonological dyslexia:

- As a strategy for spelling, assess whether Jeanette can recognize when a word is spelled correctly or incorrectly. If so, teach Jeanette to generate alternative spellings for a word that "doesn't look right." Then she can utilize visual recognition to identify the correct spelling.
- To connect layers of language for reading, ask Jeanette to sort words using suffixes to mark tense or number. For example, include words with plural pronounced /ez/ (horses), /s/ (bats), or /z/ (knees), and words with no suffix (geese).

The **PAL Research-Based Reading and Writing Lessons**[4] is available for purchase on its own, or as a downloadable PDF within the User's Guide of the PAL–II Reading and Writing. Fifteen lesson sets are included: five sets for Tier 1/early intervention, five sets for Tier 2/curriculum modification, and five sets for Tier 3/tutorials for dyslexia and dysgraphia. The PAL–II provides guidance for linking results with specific lesson sets.

The **KTEA–3 score reports** in Q-global and Q-interactive include customizable teaching objectives and intervention suggestions based on error analysis results.

- Example of a teaching objective for an error norm weakness in the Silent Letter category for the Letter & Word Recognition subtest: Given a list of ___ words containing silent letters as part of the sound pattern, the student will pronounce each word with no more than ___ silent letter errors.
- Example of an intervention suggestion for errors made on the Letter & Word Recognition subtest: Scavenger Hunt - Ask the student to look in his or her lesson book to find examples of words that begin with, end with, or contain a particular sound.

The **WIAT–III score reports** in Q-global and Q-interactive provide customizable intervention goal statements based on skills analysis results. These statements include instructional recommendations for writing annual goals and short-term objectives based upon the results of the skills analysis or, for subtests without skills analysis, overall subtest performance.

- Example of an intervention goal statement for the category of Schwa Vowel Sounds for the Word Reading subtest: Given a list of ___ (circle/enter: one, two, three, ____) -syllable words containing ___ schwa vowel sounds, the student will read the list aloud with no more than ___ schwa vowel errors. Schwa vowel sounds will include (circle): a, e, i, o, u, y. Schwa vowel (a) examples: above, alone, disappoint

Progress Monitoring Tools

The Pearson dyslexia toolkit for progress monitoring includes the following tools:

- Growth scale values: provided in the KTEA–3, WIAT–III, WRAT5, WRMT–III, PPVT–4, and EVT–2
- Relative Performance Index scores: provided in the WRMT–III
- **aims**web™Plus

Growth scale values (GSVs) are preferred over standard scores and percentile ranks for measuring growth because GSVs reflect the examinee's absolute (rather than relative) level of performance. GSVs are useful for comparing an examinee's performance on a particular subtest or composite relative to his or her own past performance, whereas standard scores and percentile ranks are useful for comparing performance relative to peers. For tests with two forms (KTEA–3, WRAT5, WRMT–III), GSVs obtained on one form are directly comparable to GSVs obtained on the other form. A significant change in GSV scores indicates that the confidence intervals around the GSVs do not overlap and the examinee has demonstrated significant progress. GSV analyses and charts are available in Q-global and Q-interactive for the KTEA–3 and WIAT–III. For the KTEA–3, WIAT–III, WRAT5, and WRMT–III, a GSV of 500 corresponds to the achievement of an average student finishing grade 3; however, GSVs are not comparable across tests or subtests. The PPVT–4 and EVT–2 also include GSVs. Please refer to Appendix G in the respective test manuals for interpretation guidance and statistically significant change ranges by age.

Relative Performance Index (RPI) scores provide a way of translating a normative score into task-performance terms. The RPI is expressed as a quotient: the numerator is the examinee's probability of success on the target items, and the denominator is the probability of success of the average individual in the reference group—which is always 90%. An RPI of 70/90, for example, indicates that the examinee will perform with 70% accuracy on items that the average individual in the same grade or age performs with 90% accuracy. RPI scores describe the probability of successfully performing a task, not relative standing in a group. An RPI score always represents the same relative performance, regardless of developmental changes in reading ability.[50] Changes in RPI scores over time provide one method of measuring progress, provided that the educational team establishes criteria for sufficient growth based on RPI scores.

aimsweb™Plus offers enhanced screening and progress monitoring measures for grades K–8. In addition to CBM measures, **aims**web™Plus standards-based assessments provide more information about each student's reading performance and suggest what kind of intervention may be most effective. The Early Literacy measures in **aims**web™Plus are intended for grades K–1 and include Print Concepts, Letter Naming Fluency, Initial Sounds, Auditory Vocabulary,

Letter Word Sounds Fluency, Phoneme Segmentation, Word Reading Fluency, and Oral Reading Fluency. The Reading assessment system developed for grades 2–8 includes the measures Vocabulary, Reading Comprehension, Silent Reading Fluency, and Oral Reading Fluency.

The use of GSV and RPI scores within diagnostic achievement tests are intended to measure growth over extended periods of time, such as annually. In contrast, **aims**web™Plus progress monitoring measures are designed to be sensitive to growth over short periods of time; depending on the intensity of the intervention and other factors, progress can be monitored as often as once a week.

Interpreting Assessment Data for Dyslexia Identification

Table 7 provides a sample summary of dyslexia assessment data for each of the indicators included in the hybrid model for dyslexia identification. Consider cross-validating assessment data across multiple sources of information, both qualitative and quantitative.

Table 7. Sample Summary of Dyslexia Assessment Data

	Skill/Ability/Indicator	IDA key indicator[a]	Test/ Source	Low/ Below average	Average	High/ Above average	At risk (Y)/ Not at risk (N)	N/A or Not observed
Symptoms of Difficulty	Treatment response[b]							
	Alphabet writing							
	Letter knowledge and phonics	X						
	Decoding pseudowords	X						
	Word reading	X						
	Reading fluency	X						
	Spelling	X						
	Written expression	X						
	Reading comprehension < Listening comprehension[c]							
Causes/Correlates	Phonological processing	X						
	Rapid automatic naming	X						
	Auditory verbal working memory	X						
	Processing speed							
	Long-term storage and retrieval							
	Associative memory (Learning efficiency)							
	Orthographic processing							
Risk Factors	Dyslexia screening results							
	Family history							
	History of language impairment							
	Receptive vocabulary[d]	X						
Possible Strengths	Fluid reasoning							
	Oral language: Listening, speaking, vocabulary, grammar							
	Math: Calculation, problem solving, fluency							

[a] The key skill areas recommended for dyslexia assessment by the International Dyslexia Association.[18]
[b] Including poor response to instruction and n or more symptoms as inclusionary criteria may improve the stability of dyslexia identification over time.
[c] Greater impairment in reading comprehension relative to listening comprehension is a symptom of dyslexia.
[d] Receptive vocabulary may be either a risk factor for dyslexia at a young age when associated with a language impairment, a correlate among older individuals with dyslexia who read less than their peers, or a relative strength for individuals with dyslexia.

How the Pearson Dyslexia Toolkit Works: Two Scenarios

School based processes and procedures for dyslexia identification vary widely. The following two scenarios exemplify how different school systems may implement the dyslexia toolkit.

Scenario 1: A school district implements a universal screening process whereby all students, starting with Kindergarten, are screened for dyslexia using the Shaywitz DyslexiaScreen. Those students who are identified as "at risk" are given a follow-up behavioral screener, using the KTEA-3 Dyslexia Index score. Following this two-step screening process, the student support team meets to determine next steps. Students at risk are given supplemental instruction, using a multi-linguistic word study program for 9–12 weeks. To monitor academic progress, curriculum-based measures are administered weekly, and the KTEA-3 subtests from the Dyslexia Index score are re-administered using the alternate form every 3–4 months. The subtest growth scale values (GSVs) are charted and compared over time to determine if significant progress has been observed. Underperforming students are referred for a comprehensive evaluation that includes cognitive, language, and achievement measures. The student support team considers these test results and other sources of information, such as school grades/test scores, classroom observation, teacher reports, and parent/caregiver interviews (family history/background information), to determine what services a student is qualified to receive and how best to improve the student's performance.

Scenario 2: A school district administers **aims**web™Plus to all students as a benchmark screener. Students with low performance on the reading benchmark are further screened with the Shaywitz DyslexiaScreen. Students identified as "at risk" based on these measures are administered three subtests from the KTEA-3 Brief to obtain the BA-3 composite score. Based on these results, the child study team meets to determine next steps and the most appropriate intervention approach. **aims**web™Plus is used to monitor progress and the team continually evaluates the progress monitoring data to determine if instructional adjustments are needed. The child study team refers students for a special education evaluation based on insufficient response to instruction. The special education assessment process includes assessments from multiple disciplines, including language, achievement, ability, and cognitive areas. The child study team considers these test results and other sources of information to determine what services a student is qualified to receive and how best to improve the student's performance.

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