OSPA Annual 2008 Spring Conference

Understanding Specific Learning Disabilities:
From Assessment to Interventions

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Presented by

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Topics

- the history of specific reading disability, assessment and intervention
- the role of RTI in the assessment process
- the importance of cognitive and linguistic factors
- the development of basic reading and spelling skills
- the selection of effective interventions

Conclusions from Hinshelwood regarding Congenital Word-Blindness

- particular areas of the brain appear to be involved
- the children often have average or above intelligence and good memory in other respects
- the problem with reading is localized, not generalized to all areas of academic performance

Source:

Hinshelwood, J. (1902). *Congenital word-blindness with reports of two cases.* London: John Bale, Sons & Danielsson.

Central Themes from Dr. James Hinshelwood (1902)

- the children do not learn to read with the same rapidity as other children
- the earlier the problem is identified, the better so as not to waste valuable instructional time
- the children must be taught by special methods adapted to help them overcome their difficulties
- the sense of touch can help children retain visual impressions
- persistent and persevering attempts will often help children improve their reading.

Source:

Hinshelwood, J. (1902). *Congenital word-blindness with reports of two cases.* London: John Bale, Sons & Danielsson. Ltd. .

The Importance of Early Intervention Hinshelwood (1902)

- "It is evident that it is a matter of the highest importance to recognise as early as possible the true nature of this defect, when it is met with in a child. It may prevent much waste of valuable time and may save the child from suffering and cruel treatment…The sooner the true nature of the defect is recognised, the better are the chances of the child's improvement" (p. 10).

Source:

Hinshelwood, J. (1902). *Congenital word-blindness with reports of two cases.* London: John Bale, Sons & Danielsson. Ltd.

"Failure to learn to read as others do is a major catastrophe in a child's life" (p.1).

Source:

Dolch, E. W. (1939). *A manual for remedial reading. Champaign,* IL: Garrard Press.

The Reading Index

See if reading achievement is in harmony with other achievements. The other measures are administered in order to determine the child's expectation in reading and to measure the discrepancy.

1) Chronological age
2) Mental age (based on the Stanford-Binet)
3) Arithmetic computation

Monroe, M. (1932*). Children who cannot read*. Chicago: University of Chicago Press.

"It seems that we are measuring a discrepancy between reading and other accomplishments which may occur in either direction at any intellectual level" (p. 17)

"The reading defects may occur at any intellectual level from very superior to very inferior, as measured by intelligence tests" (p. 6).

Source:

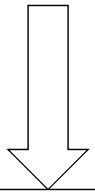
Monroe, M. (1932). *Children who cannot read.* Chicago: University of Chicago Press.

Central Themes of Dr. M. Monroe

- different factors affect performance in different children
- children require intensive remedial training
- the training must continue until reading is in harmony with the child's other capacities and achievement
- methods must be modified to meet the needs of each individual
- problems arise in behavior and personality but disappear as reading improves
- some children of superior intelligence struggle to learn to read

Monroe, M. (1932). Children who cannot read. Chicago: The University of Chicago Press.

"The children of superior mental capacity who fail to learn to read are, of course, spectacular examples of specific reading difficulty since they have such obvious abilities in other fields." (p. 23)



Source:
Monroe, M. (1932). *Children who cannot read*. Chicago: University of Chicago Press.

Case 3: Betty

Betty represents a case of reading retardation in a very bright little girl. She was completing the second year in school without having been able to learn to read. When examined she was seven years and four months of age, with a mental age of ten years, I. Q. 135. Arithmetic measured high second grade. Reading and spelling measured very low first grade... She had a very engaging manner and had learned many ways of diverting attention from the fact that she could not read. When the reading tests were presented she pushed them aside and said, "Let's don't do any reading. I know some arithmetic games that are lots of fun..." When finally persuaded to attempt the tests she showed considerable emotional tension, clearing her voice, saying "ah" several times before attempting each word, and flushing over her obvious errors (p. 10).

Monroe, M. (1932). *Children who cannot read*. Chicago: The University of Chicago Press.

The rate of progress under remedial instruction was found to be a function of:

- the child's intelligence
- age
- number of hours of training
- severity of the disability
- behavior and personality difficulti
- supervision of the remedial techniques
- (p. 157)

"The remedial teaching of reading is a different problem from the usual teaching of reading to unselected children. The problem of educational instruction in reading is to find the methods which are best adapted to develop skill in reading in the majority of children. The problem of remedial instruction in reading is to find a possible method of learning for those children who not been able to learn to read by methods adapted to the group. The methods found helpful for reading-defect cases may not be necessary or advisable in ordinary instruction" (p. 113).

"To be effective, remedial instruction in reading must be preceded by careful diagnosis" (Monroe & Backus, 1937).

"Diagnosis is one thing; treatment is another. No one diagnosis applies to all cases; no one treatment will eradicate all trouble"
(p. 117).

Stanger, M. A., & Donohue, E. K. (1937). *Prediction and prevention of reading difficulties.* New York: Oxford University Press.

"Gains in the remedial work were accompanied in many cases by greater interest in reading and favorable changes in behavior" (p. 129).

A Major Problem: Inappropriate Reading Material

- scarcity of high interest books with simple reading vocabulary
- provision of reading books for only one grade level for each grade
- inflexible programs so that teachers cannot adjust the difficulty of the texts to the achievement level of the students

Monroe, M., & Backus, B. (1937). *Remedial reading.* Boston: Houghton Mifflin.

"Furthermore, workbooks should be ordered in terms of the reading levels of the pupils in the room. No one can justify ordering thirty similar third-grade workbooks for the thirty dissimilar third-grade pupils found in any classroom in the country" (p. 525).

Source:

Betts, E. A. (1946). *Foundations of reading instruction.* New York: American Book Company.

Components of Effective Reading Instruction

- provided individually or in small groups
- delivered systematically at a regular time each day
- supported with a supply of books suitable to child's reading level
- instructed by specially trained reading teachers

Source: Monroe, M., & Backus, B. (1937). *Remedial reading: A monograph in character education.* Boston: Houghton Mifflin.

Performance on Specific Intellectual Abilities

"Sometimes children of good general intelligence show retardation in some of the specific skills which compose an intelligence test" (p. 22)

Monroe, M., & Backus, B. (1937). *Remedial reading.* *Boston*: Houghton Mifflin.

"Moreover, it seems probable that psychometric tests as ordinarily employed give an entirely erroneous and unfair estimate of the intellectual capacity of these children" (p. 582).

Source:
Orton, S. T. (1925). *Word-blindness in school children. Archives of Neurology and Psychiatry, 14*, 581-615.

Central Themes from Dr. Samuel Orton

- disabilities can be overcome by special training
- many of the children have a high degree of intelligence
- data must be collected regarding the effects of the training
- emotional factors are of primary importance

Source:

Orton, S. T. (1937). *Reading, writing, and speech problems in children*. New York: W. W. Norton.

Central Themes from Dr. Grace Fernald

- the difficulties can be partially or fully overcome with proper diagnosis and treatment
- methods have to be adapted to the child
- multisensory instruction is beneficial
- methods need to be applied before the child has failed

Source: Fernald, G. M. (1943). *Remedial techniques in basic school subjects.* New York: McGraw-Hill.

"Children with developmental imbalances are those who reveal a developmental disparity in psychological processes related to education ..." (p. 28)."The key characteristic that identifies this child to the observer is the substantial *difference* between the worst and the best of his developing intelligences, or the substantial intraindividual differences noted within the child. The children with large developmental imbalances can be counted on to cause considerable difficulties in any educational program which is based on the assumption that a child's developmental processes will be within narrow limits" (p. 29).

"The information provided by this patterning of abilities is much more important than his single mental age score or language scores. While his Binet mental level is listed as between five and six years, his internal variation from three to eight years is the more important educationally diagnostic information. It not only establishes the fact of developmental imbalance, but it locates the areas of specific disability" (p. 29).

"The single most important factor in planning for a child with a learning disability is an intensive diagnostic study. Without a comprehensive evaluation of his deficits and assets, the educational program may be too general, or even inappropriate. The diagnostic study should include an evaluation of sensory acuity, intelligence, language (spoken, read, written), motor function, educational achievement, emotional status, and social maturity (Myklebust, 1954)" (p. 50).

"The implication is that it is necessary to have immediate access to all diagnostic findings because it is from these that the educational approach must be evolved. Sometimes teachers are required to begin remediation without adequate knowledge of the deficits and integrities. Although information can be obtained from personal contact with the child, precise planning is possible only when these observations are supplemented by detailed diagnostic information" (p. 51).

ITPA Profile

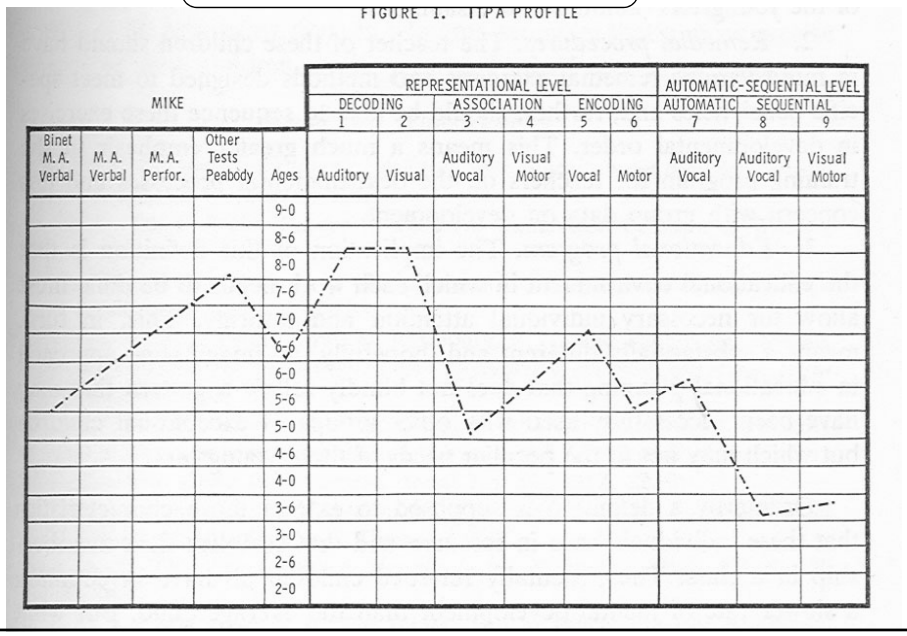


FIGURE 1. ITPA PROFILE

MIKE

Binet M.A. Verbal	M.A. Verbal	M.A. Perfor.	Other Tests Peabody	Ages	REPRESENTATIONAL LEVEL: DECODING 1 Auditory	DECODING 2 Visual	ASSOCIATION 3 Auditory Vocal	ASSOCIATION 4 Visual Motor	ENCODING 5 Vocal	ENCODING 6 Motor	AUTOMATIC-SEQUENTIAL LEVEL: AUTOMATIC 7 Auditory Vocal	SEQUENTIAL 8 Auditory Vocal	SEQUENTIAL 9 Visual Motor
				9-0									
				8-6									
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				3-0									
				2-6									
				2-0									

"I like to define a learning disability as a psychological or neurological impediment to development of adequate perceptual or communicative behavior, which first is manifested in discrepancies among specific behaviors or between overall performance and academic achievement…" (p. 617).

Source:

Arena, J. (1978). *An interview with Samuel Kirk.* Academic Therapy, 13,617-620.

"… the concept of dyslexia requires that the deficits displayed by such children not extend too far into other domains of cognitive functioning" (p.278)."In short, the key deficit in dyslexia must be a vertical faculty rather than a horizontal faculty--a domain-specific process rather than a process that operates across a variety of domains" (p.279).

Source:

Stanovich, K. E. (1993). *The construct validity of discrepancy definitions of reading disability. In G. R. Lyon, D. B. Gray, J. F. Kavanagh, N. A. Krasnegor (Eds.),Better understanding learning disabilities: New views from research and their implications for education and public policies (pp. 273-307).* Baltimore: Paul H. Brookes Publishing Co.

"The diagnosis of dyslexia is as precise and scientifically informed as almost any diagnosis in medicine" (p. 165).

Source:

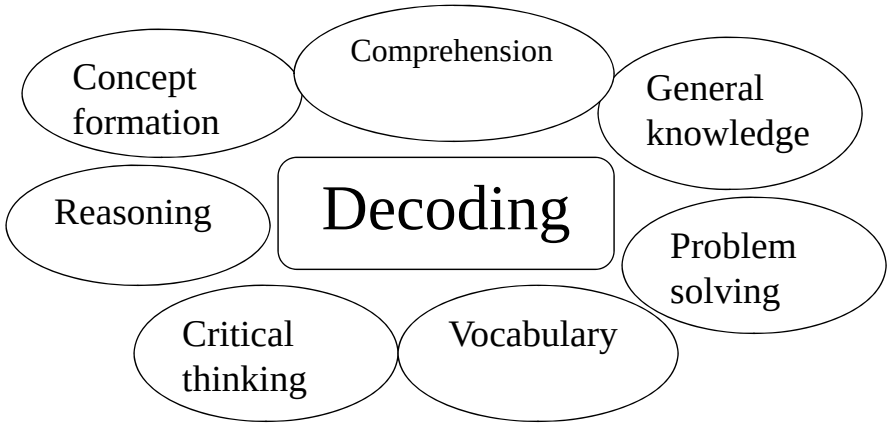
Shaywitz, S. (2003). *Overcoming dyslexia: A new and complete science-based program for overcoming reading problems at any level*. New York: Alfred Knopf.

Diagnosis of Word Blindness

"With the possession of a knowledge of the symptoms, there is little difficulty in the diagnosis of congenital word-blindness when the cases are met with, since the general picture of the condition stands out as clear-cut and distinct as that of any pathological condition in the whole range of medicine" (p. 88).

Source: Hinshelwood, J. (1917). *Congenital word-blindness.* London: H. K. Lewis.

Sea of Strengths Model of Dyslexia



Shaywitz, S. (2003). Overcoming dyslexia: A new and complete science-based program for reading problems at any level. New York: Alfred A. Knopf. (p. 58)

Two Main Concepts of Unexpected Underachievement

- Intra-ability discrepancies
  (discrepancies among abilities...the pattern of strengths and weaknesses... unexpected compared to other abilities)

- Ability-achievement discrepancy
  (a discrepancy between overall performance and specific academic achievement... unexpected compared to general ability or oral language)

"In summary, by adopting verbal IQ as an aptitude measure, we would be closer to a principled definition of potential in the reading domain, that is, the academic level that would result from instruction if the person's dysfunction were totally remediated" (p. 290).

Source:

Stanovich, K. E. (1993). The construct validity of discrepancy definitions of reading disability. In G. R. Lyon, D. B. Gray, J. F. Kavanagh, N. A. Krasnegor (Eds.), *Better understanding learning disabilities: New views from research and their Implications for education and public policies* (pp. 273-307). Baltimore: Paul H. Brookes Publishing Co.

Verbal Ability as the Measure of Potential

By the end of elementary school: "Children should be able to comprehend, or construct, the meaning of what is being read at a level consistent with their general verbal ability." (p.55)

Source: Torgesen, J. K. (2000). Individual differences in response to early interventions in reading: The lingering problem of treatment resisters. *Learning Disabilities Research & Practice, 15*, 55-64.

Definition of a Specific Learning Disability

General.

The term means a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, that may manifest itself in an imperfect ability to listen, think, speak, read, write, spell, or to do mathematical calculations, including conditions such as perceptual disabilities, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia.

The biggest discrepancy that exists is between the SLD definition and how we operationalize it.

Sources:

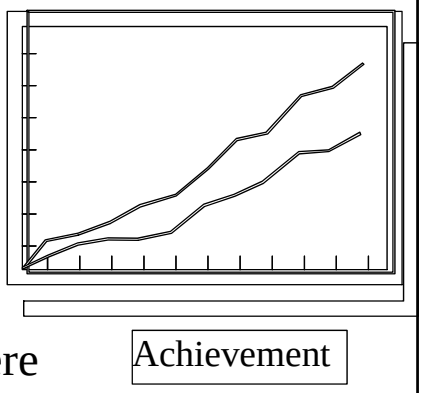
Hale, J. B., Naglieri, J. A., Kaufman, A. S., & Kavale, K. A. (2004). Specific learning disability classification in the new Individuals with Disabilities Education Act: The Danger of Good Ideas. *The School Psychologist, 58 (1),* 6-13, 29.

Kavale, K. A., Kaufman, A. S., Naglieri, J. A., & Hale, J. B. (2005). Changing procedures for identifying learning disabilities: The danger of poorly supported ideas. *The School Psychologist, 59 (1),* 16-25.

Ability-Achievement Discrepancies

Most states required a discrepancy between intelligence and achievement

Intelligence test results were used to predict potential for success and achievement test results were used to represent actual school performance



...the criterion set for the size of discrepancy that counts as a reading or writing disability is always arbitrary and varies widely among states and among schools within states. (pp.158-159)

Whether a child is or is not diagnosed as learning disabled depends on the state and the local criteria where a child lives or on the personal philosophy of an independent evaluator who assesses the child. (p. 164)

Source: Berninger, V. W. (1996). *Reading and writing acquisition: A developmental neuropsychological perspective.* Boulder, CO: Westview Press.

Why Would Students with LD have an Ability-Achievement Discrepancy?

- Their abilities are better than their academic performance in specific domains (e.g., verbal abilities higher than reading, writing, or math).
- They have not received adequate help and intensive early intervention.
- They have strengths in specific areas that are measured by the ability test and weaknesses in areas measured by the achievement tests.

Though the formula method may have some appeal because it requires less clinical competence and judgment, the fact remains that reducing an important diagnostic decision to a mathematical equation gives a false sense of objectivity to a contrived procedure that is still essentially subjective. (p. 274)

Source: Simpson, R.G., & Buckhalt, J. A. (1990). *School Psychology International, 11*, 273-279.

"(6) SPECIFIC LEARNING DISABILITIES.—

"(A) IN GENERAL.—Notwithstanding section 607(b), when determining whether a child has a specific learning disability as defined in section 602, a local educational a[illegible]ed to take into consideration w[illegible] discrepancy between achieve-n[illegible]y in oral expression, listening c[illegible]pression, basic reading skill, reading comprehen[illegible] mathematical calculation, or mathematical reasoning.

Response to research – based intervention can be used as PART of the evaluation procedures.

"(B) ADDITIONAL AUTHORITY.—In determining whether a child has a specific learning disability, a local educational agency may use a process that determines if the child responds to scientific, research-based intervention as a part of the evaluation procedures described in paragraphs (2) and (3).

RTI

- Response to Intervention
- Responsiveness to Intervention

Inadequate Response to Intervention

Limited Response to Intervention

When provided with good instruction aimed at their needs, children with SLD do learn…

What RTI Can Do

- Be an effective component of the prereferral process.
- Raise awareness and application of the most effective interventions.
- Ensure that ineffective instruction is not the reason for a student's difficulties.
- Encourage accountability for the progress of all students.
- Encourage team problem solving when progress is limited.
- Reduce unnecessary referrals to special education.

The Dangers of Sole Reliance on RTI for Identification of SLD

- The cause(s) of the limited response to treatment will not be well understood by teachers, parents, and the student.
- Implementation has only been widely explored for early reading
- Students with above average abilities and SLD will likely not be identified.
- SLD will be confused with all forms of poor learning and underachievement.
- The category of SLD will be eliminated.
- Individuals with SLD will be misunderstood and denied the accommodations and interventions they need to be successful.

If applied in isolation, RTI methods will not increase diagnostic sensitivity and specificity, but will result in a generic "learning problems" category, comprising a considerable portion of the population.

Source:

Hale, J. B., Naglieri, J. A., Kaufman, A. S. & Kavale, K.A. (2004). Specific learning disability classification in the new Individuals with Disabilities Education Act: The danger of good ideas. *The School Psychologist*,*58*, 6-13.

As a field of study matures, its language gets more specific, not less. Less specific language or more general terms without an increase in more specific subterms is a pretty reliable indication of regression, not advances, in any field of work.

Excerpted from e-mail sent to: spedpro-bounces@list.mail.virginia.edu, James Kauffman, Thursday, October 19, 2006, Title: Tiresome.

Hasn't Special Education always been based on RTI principles?

- Identify children who are struggling
- Determine why they are struggling
- Select interventions
- Monitor their progress
- Revise the interventions as needed
- Monitor progress

"When I was working as a school psychologist some 50 years ago and received a referral from a teacher about a child who was having trouble learning, the very first thing I did was to visit the teacher to inquire about the problem. I wanted to know what the child was having trouble with. I wanted to know what the teacher had tried that did not work and most importantly, I wanted to know what had been done that had worked.

At that time I had never heard of Response to Intervention (RTI) and I certainly would not have predicted that there were going to be initials to describe what has always been good practice, as a 'new' procedure" (p. 151).

Source: Zach, L. J. (2005). Déjà vu all over again: The current controversy over the identification of learning disability. *The School Psychologist*, *59*, 151-155.

What RTI Cannot Do

Classify

Diagnose

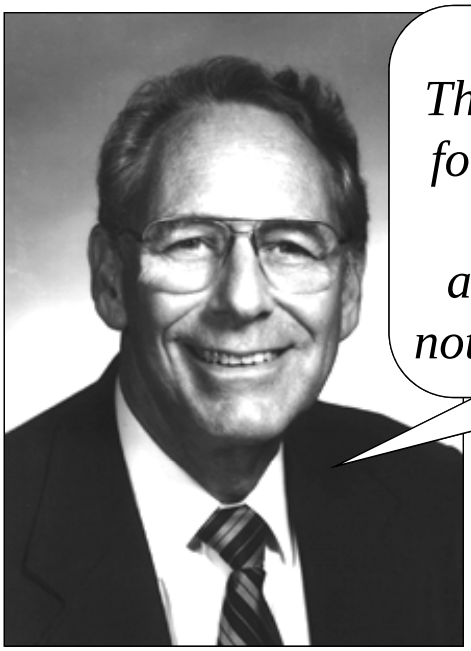
Individualize the Treatment

"The single most important factor in planning for a child with a learning disability is an intensive diagnostic study. Without a comprehensive evaluation of his deficits and assets, the educational program may be too general, or even inappropriate. The diagnostic study should include an evaluation of sensory acuity, intelligence, language (spoken, read, written), motor function, educational achievement, emotional status, and social maturity (Myklebust, 1954)."

Dr. Alan Kaufman

… there is a demand for the comprehensive assessment to drive intervention. This is the way it has always been, and this is the way it will always be because the referral questions for children with SLD have always asked, What is wrong? And how can we help? These questions demand differential diagnosis, a large part of which is determined by the cognitive abilities present in the individual child (p. 211).

Source: Kaufman, A. S., Lichtenberger, E. O., Fletcher-Janzen, E., & Kaufman, N. L. (2005). *Essentials of the K-ABC-II Assessment.* New York: John Wiley & Sons.



The primary purpose for testing should be to find out more about the problem, not to just get a score.

Ability-Achievement RTI

Requires a discrepancy between ability-achievement	Requires a discrepancy between classroom and actual performance
Doesn't clarify the reasons for failure	Doesn't clarify the reasons for failure
Unexpected underachievement relative to ability	Unexpected underachievement relative to evidence-based instruction
Within the child	The child within the environment

Regulations IDEA 2004, August 14, 2006

§300.309(a)(2)(ii) permits consideration of:

The child exhibits a pattern of strengths and weaknesses in performance, achievement, or both, relative to intellectual development, that is determined by the team to be relevant to the identification of a specific learning disability.

Learning disabilities are specific patterns of cognitive strengths and weaknesses (intra-individual discrepancies) that differentially impact the development of various aspects of achievement.

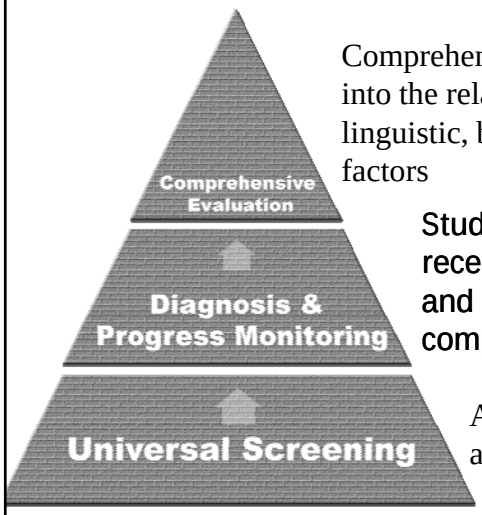
Learning disabilities are disorders in the basic psychological processes…

Ability-Achievement	Intra-Ability
A discrepancy between ability-achievement	A discrepancy among varying abilities
Does not clarify the reasons for failure	Helps clarify the reasons for failure
Unexpected underachievement relative to overall ability	Unexpected underachievement relative to other abilities
Focuses on full-scale scores	Focuses on factor, cluster, and subtest scores

	RTI	COG Assessment
Place in the evaluation process	Prereferral	Referral
Focus	Group	Individual
Type of evaluation	Screening and progress monitoring	Comprehensive
Nature of assessment	Simple and narrow	Complex and broad
Implementation	School-wide support	Specialists

	RTI	COG Assessment
Purposes	Identify low achievement	Identify and diagnose LD
	Intervene early	Identify strengths and weaknesses
	Help children	Help children

Three Levels of Evaluation



Comprehensive evaluation provides insights into the relative contributions of cognitive, linguistic, behavioral, and environmental factors

Students who do not respond may receive more intensive interventions and then be recommended for a comprehensive evaluation

All students are screened to ensure adequate progress

"If these tests will give us a basis from which we can start to understand a child's difficulties, they will have justified the time spent on them. Anything which helps educators or parents to *understand* any phase of development or lack of development is of immeasurable value" (p. 189).

Source:

Stanger, M. A., & Donohue, E. K. (1937). *Prediction and prevention of reading difficulties.* New York: Oxford University Press.

LD Identification

- Consider pre-referral intervention data.
- Consider ability-achievement discrepancies.
- Consider extrinsic factors that affect learning.
- Examine the pattern of strengths and weaknesses.
- Link the areas of weakness to specific academic skill problems.
- Specify appropriate interventions based on the problems.

"Given the findings from the neuroimaging and neuropsychological fields of deficient performance on measures of working memory, processing speed, auditory processing ability, and executive functions, evaluation of these skills is necessary to determine the most appropriate program to fit the individual child's needs. The danger with not paying attention to individual differences is that we will repeat the current practice of simple assessments in curricular materials to evaluate a complex learning process and to plan for interventions with children and adolescents with markedly different needs and learning profiles."

Source: Semrud-Clikeman, M. (2005). Neuropsychological aspects for evaluating learning disabilities. *Journal of Learning Disabilities, 38,* 563-568.

What Do We Know

The reading disorder is specific and does not extend into all of the person's accomplishments

A specific problem exists in cognitive, linguistic, or perceptual processes that affects reading development

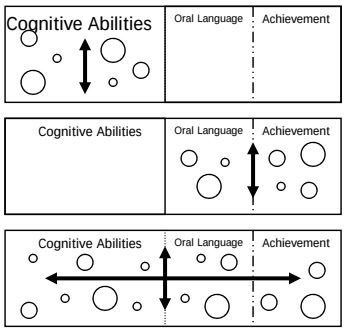
Reading is the most common area of disability, but disorders in mathematics and written language also exist

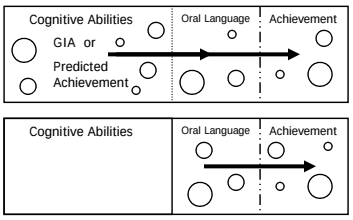
Domain specific labels, such as reading disability or dyslexia, are more descriptive of the problem than the generic term of learning disability

Interpretation of the WJ III Discrepancies

Variation and Discrepancy Procedures

Intra-Ability	Ability/Achievement
• Intra-Cognitive • Intra-Achievement • Intra-Individual	• GIA (STD or EXT) • Predicted Achievement • Oral Language Ability





Diagnose

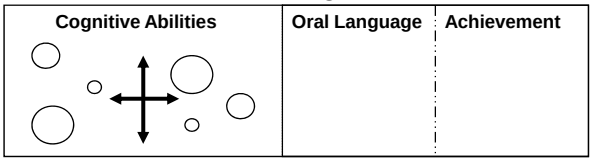
Identify Strengths & Weaknesses

Early Identification

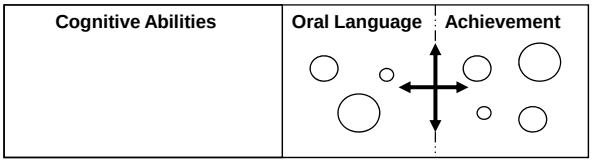
Program Planning

Intra-Ability Variation Procedures

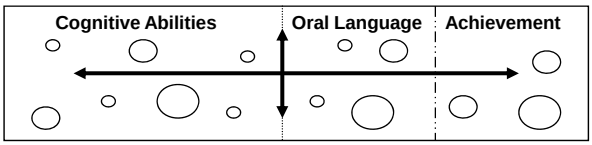
Intra-cognitive



Intra-achievement



Intra-individual



7 CHC Cognitive Factors

Comprehension-Knowledge *(Gc):* The breadth and depth of knowledge of a culture

Long-Term Retrieval *(Glr):* ability to store and retrieve information

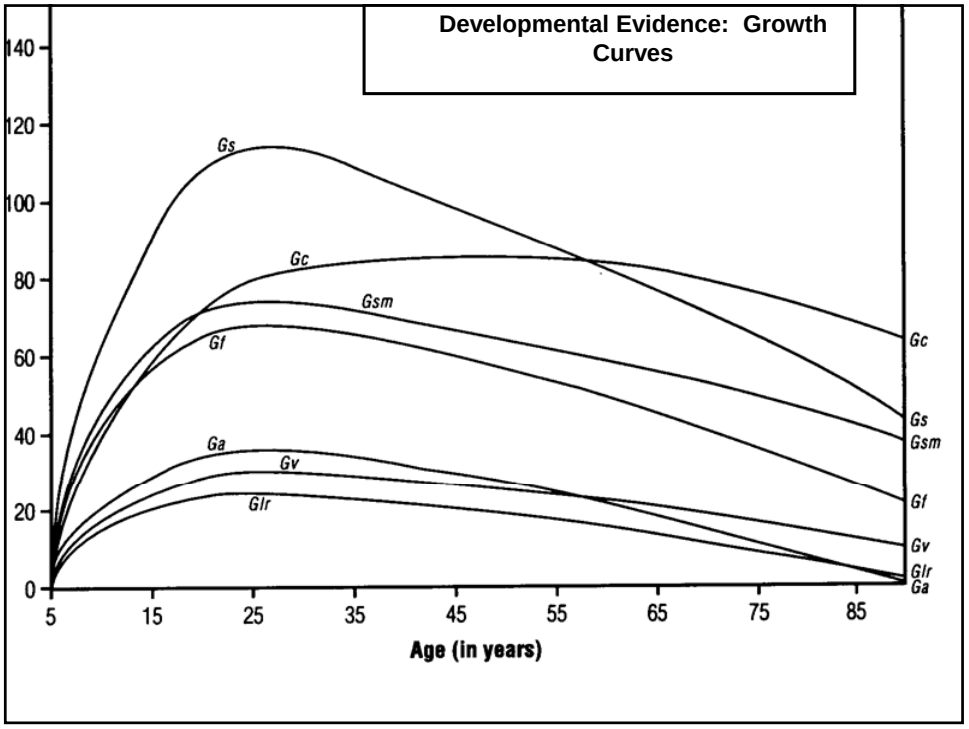
Visual-Spatial Thinking *(Gv):* ability to perceive, analyze, synthesize and think with visual patterns

Auditory Processing *(Ga):* ability to analyze, synthesize and discriminate auditory stimuli

Fluid Reasoning *(Gf):* ability to reason, form concepts, & solve problems *(using unfamiliar information or novel procedures)*

Processing Speed *(Gs):* ability to perform automatic, speeded cognitive tasks under pressure to maintain focused attention

Short-Term Memory *(Gsm):* ability to apprehend and hold information in immediate awareness and then use it within a few seconds



Intra-Cognitive Variations

Requires 14 tests (1-7 & 11-17)

DISCREPANCIES	STANDARD SCORES Actual	Predicted	Difference	DISCREPANCY PR	SD	Significant at + or - 1.50 SD (SEE)
Intra-Cognitive						
COMP-KNOWLEDGE (Gc)	*122*	*93*	*+29*	*99*	*+2.48*	*Yes*
L-T RETRIEVAL (Glr)	*77*	*100*	*-23*	*4*	*-1.76*	*Yes*
VIS-SPATIAL THINK (Gv)	*120*	*96*	*+24*	*96*	*+1.79*	*Yes*
AUDITORY PROCESS (Ga)	*79*	*100*	*-21*	*6*	*-1.57*	*Yes*
FLUID REASONING (Gf)	*105*	*95*	*+10*	*81*	*+0.86*	*No*
PROCESS SPEED (Gs)	*104*	*97*	*+7*	*70*	*+0.52*	*No*
SHORT-TERM MEM (Gsm)	*68*	*101*	*-33*	*0.5*	*-2.56*	*Yes*

Strengths: **Comprehension-Knowledge, Visual-Spatial Thinking**

Weaknesses: **Long-Term Retrieval, Auditory Processing, Short-Term Memory**

Discrepancy Percentile Ranks

Reflects the percent of the population that has a difference score that size. (*Based on age or grade mates with same predicted score.)*

In Broad Written Language, only 2% of grade mates with the same predicted score, would obtain a standard score of 80 or lower.

Angelina's discrepancy percentile rank (PR: .1) indicates that only 1 in 1000 age mates with the same predicted score would obtain a Broad Reading score (SS: 70) the same or lower.

On the intra-achievement discrepancies, when Chris's obtained standard score (SS: 125) in Academic Knowledge is compared to his predicted score, only 3 out of 1000 students would have a score the same or higher (Discrepancy PR = 99.7).

Intra-Achievement Variations

DISCREPANCIES *Intra-Achievement*	STANDARD SCORES Actual	Predicted	Difference	DISCREPANCY PR	SD	Significant at + or - 1.50 SD (SEE)
BASIC READING SKILLS	74	103	-29	<0.1	-3.28	Yes
READING COMP	94	100	-6	26	-0.63	No
MATH CALC SKILLS	107	99	+8	73	+0.62	No
MATH REASONING	117	98	+19	97	+1.87	Yes
BASIC WRITING SKILLS	74	103	-29	0.3	-2.74	Yes
WRITTEN EXPRESSION	92	100	-8	24	-0.71	No
ORAL EXPRESSION	112	99	+13	86	+1.10	No
LISTENING COMP	102	99	+3	59	+0.24	No
ACADEMIC KNOWLEDGE	125	97	+28	99.5	+2.60	Yes

Strengths: Math Reasoning, Academic Knowledge

Weaknesses: Basic Reading Skills, Basic Writing Skills

What is used as the predicted score?

Intra-Individual Variations

DISCREPANCIES *Intra Individual*	STANDARD SCORES Actual	Predicted	Difference	DISCREPANCY PR	SD	Significant at + or - 1.50 SD (SEE)	
COMP-KNOWLEDGE (Gc)	122	96	+26	99.6	+2.62	Yes	COG
L-T RETRIEVAL (Glr)	77	100	-23	5	-1.62	Yes	
VIS-SPATIAL THINK (Gv)	120	98	+22	94	+1.53	Yes	
AUDITORY PROCESS (Ga)	79	100	-21	7	-1.50	Yes	
FLUID REASONING (Gf)	105	98	+7	72	+0.59	No	
PROCESS SPEED (Gs)	104	98	+6	65	+0.40	No	
SHORT TERM MEM (Gsm)	68	100	-32	1	-2.38	Yes	
PHONEMIC AWARE	71	100	-29	2	-2.09	Yes	
WORKING MEMORY	76	100	-24	2	-1.97	Yes	
BASIC READING SKILLS	74	100	-26	0.3	-2.74	Yes	ACH
READING COMP	94	98	-4	33	-0.45	No	
MATH CALC SKILLS	107	98	+9	77	+0.73	No	
MATH REASONING	117	97	+20	97	+1.94	Yes	
BASIC WRITING SKILLS	74	100	-26	1	-2.41	Yes	
WRITTEN EXPRESSION	92	99	-7	30	-0.53	No	
ORAL EXPRESSION	112	98	+14	89	+1.20	No	
LISTENING COMP	102	98	+4	65	- 0.39	No	
ACADEMIC KNOWLEDGE	125	97	+28	99.6	+2.65	Yes	

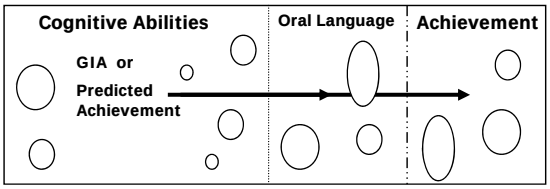
Predict present performance levels

Consider "potential" for school success

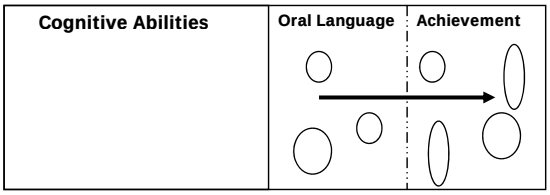
Consider if oral and written language abilities are similar

Ability/Achievement Discrepancy Procedures

GIA or Predicted ACH to Achievement



Oral Language to Achievement



Ability / Achievement Discrepancies

Ability Options	Achievement Options
Standard Battery **GIA-Standard (Tests 1-7)** **Predicted Achievement (Tests 1-7)** **Extended Battery** **GIA-Extended *(14 tests)* (Tests 1-7, 11-17)** **Oral Language-Extended *(4 tests)*** Story Recall Understanding Directions Picture Vocabulary Oral Comprehension	**Standard Battery** Broad Reading Broad Math Broad Written Language Oral Language-Std **Extended Battery** Basic Reading Skills Reading Comprehension Math Calculation Skills Math Reasoning Basic Writing Skills Written Expression Oral Expression Listening Comprehension Academic Knowledge

GIA-Standard and GIA-Extended

Represents general intelligence (*g*)

•GIA-Std based on COG tests 1-7 (one measure of each CHC factor)

•GIA-Ext based on COG tests 1-7 and 11-17

(two measures of each CHC factor)

Weightings are heaviest on *Gc* and *Gf* across the life span

Predicted Achievement Option as the Ability Measure

Based on differential weighting of cognitive tests 1-7
(some tests may be weighted very little, depending on the academic area)

Psychometrically the *best predictor* of curricular performance in the *near-term*

Predictor scores for specific areas:

- **Reading**
- **Mathematics**
- **Written Language**
- **Oral Language**

Predicted Achievement/Achievement Discrepancy

DISCREPANCIES	STANDARD SCORES Actual	Predicted	Difference	DISCREPANCY PR	SD	Significant at + or - 1.50 SD (SEE)
*Predicted Achievement/Achievement Discrepancies**						
BROAD READING	*79*	*102*	*-23*	*2*	*-2.16*	*Yes*
BASIC READING SKILLS	*74*	*97*	*-23*	*2*	*-1.99*	*Yes*
READING COMP	*94*	*102*	*-8*	*20*	*-0.84*	*No*
BROAD MATH	*115*	*102*	*+13*	*88*	*+1.20*	*No*
MATH CALC SKILLS	*107*	*102*	*+5*	*69*	*+0.49*	*No*
MATH REASONING	*117*	*102*	*+15*	*93*	*+1.45*	*No*
BROAD WRITTEN LANG	*79*	*99*	*-20*	*3*	*-1.84*	*Yes*
BASIC WRITING SKILLS	*74*	*100*	*-26*	*1*	*-2.34*	*Yes*
WRITTEN EXPRESSION	*92*	*99*	*-7*	*26*	*-0.63*	*No*
ORAL LANGUAGE (Ext)	*108*	*86*	*+22*	*97*	*+1.88*	*Yes*
ORAL EXPRESSION	*112*	*87*	*+25*	*98*	*+1.98*	*Yes*
LISTENING COMP	*102*	*89*	*+13*	*88*	*+1.17*	*No*
ACADEMIC KNOWLEDGE	*125*	*107*	*+18*	*97*	*+1.91*	*Yes*

**These discrepancies based on predicted achievement scores with ACH Broad, Basic, and Applied clusters.*

Uses differential weighting of Tests 1-7 to predict academic performance.

GIA vs Predicted Achievement
Ability / Achievement Discrepancy Options

- **The *GIA-Std* and *GIA-Ext* ability / achievement discrepancies may be useful when a generalized measure of cognitive functioning or intelligence is required**
- **The *Predicted Achievement* option is intended to determine if a person is performing as well as one would expect, given his or her measured levels of associated cognitive abilities, not to diagnose a learning disability….**

Mather & Schrank (2001)

Justin's Oral Language/Achievement Discrepancies

DISCREPANCIES	STANDARD SCORES Actual	Predicted	Difference	DISCREPANCY PR	SD	Significant at + or - 1.50 SD (SEE)
BASIC READING SKILLS	*74*	*104*	*-30*	*1*	*-2.27*	*Yes*
READING COMP	*94*	*104*	*-10*	*23*	*-0.73*	*No*
BROAD MATH	*115*	*104*	*+11*	*80*	*+0.84*	*No*
MATH CALC SKILLS	*107*	*103*	*+4*	*62*	*+0.31*	*No*
MATH REASONING	*117*	*104*	*+13*	*85*	*+1.03*	*No*
BROAD WRITTEN LANG	*79*	*104*	*-25*	*3*	*-1.85*	*Yes*
BASIC WRITING SKILLS	*74*	*103*	*-29*	*2*	*-2.16*	*Yes*
WRITTEN EXPRESSION	*92*	*103*	*-11*	*22*	*-0.78*	*No*
ACADEMIC KNOWLEDGE	*125*	*105*	*+20*	*97*	*+1.88*	*Yes*

**These discrepancies based on Oral Language (Ext) with ACH Broad, Basic, and Applied clusters.*

1. **What is used as the basis for the Predicted Score?**
2. **Write a statement describing the Discrepancy PR in Basic Reading Skills.**

Using Different Ability Measures

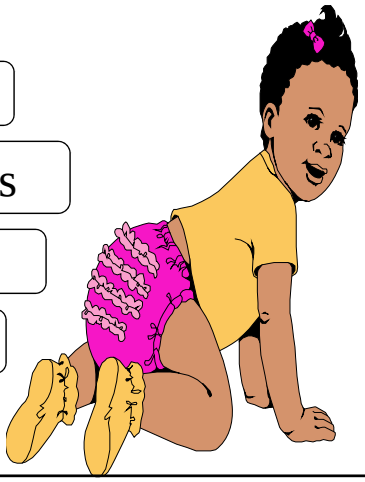
GIA-Std and Ext	**Based on all 7 CHC factors. Weights change across lifespan but Gf (fluid reasoning) and Gc (comprehension-knowledge consistently receive more weight.**
Predicted Achievement	**Based on COG tests 1-7. Weights change to provide the best prediction (e.g., Sound Blending would have more weight in Grade 1 for Broad Reading and Verbal Comprehension would have more weight in Grade 10.)**
Oral Language-Ext	**Based on the four tests of the Oral Language-Ext cluster in WJ III ACH**
WISC-IV	**Based primarily on Gc and Gv with Gs and Gsm**

For the intra-ability discrepancies, the predicted score is based on the average of the other areas.

For the ability/achievement discrepancies, the predicted score is based on the ability (i.e., GIA-Std or GIA-Ext or Oral Language-Extended).

Early Risk Factors

- Late speech development
- Difficulty with speech sounds
- Lack of interest in print
- Family history



WJ III COG Clusters

- Phonological awareness
- Processing speed
- Working memory
- Verbal comprehension

WJ III ACH Clusters

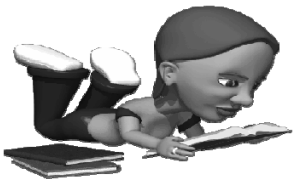
Phoneme-Grapheme Knowledge
(Word Attack and Spelling of Sounds)

Basic Reading Skills

Basic Writing Skills

Academic Fluency

Oral Language-Ext



Factors that Affect the Development of Basic Reading and Writing Skills

Attention

Phonological awareness

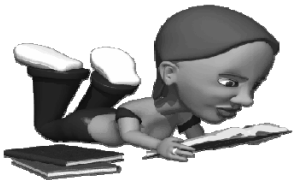
Orthographic awareness

Rapid automatized naming (RAN)

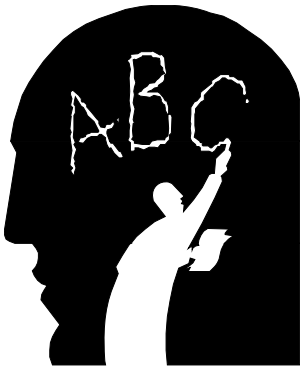
Processing speed

Working memory

Motor Skills



Neurological, genetic, environmental, and instructional factors influence one's ability to learn to read and spell.



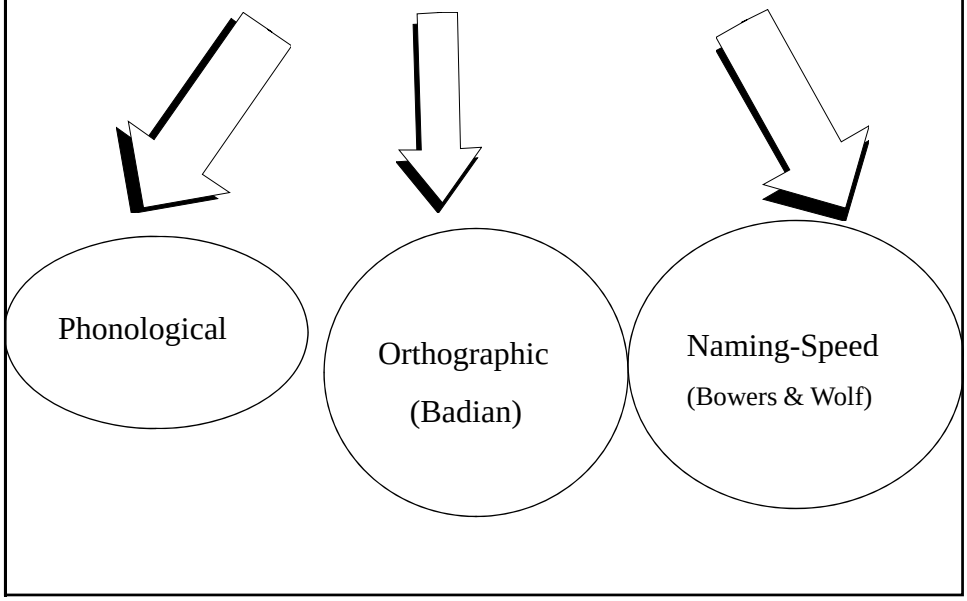
Double-Deficit Hypothesis

- Phonological Skills
- Naming-Speed (Bowers & Wolf)

"The term, double deficit, emerged as a concrete metaphor to convey at once the critical blow that the combination of both deficits represents. Just as naming-speed skills predicted word identification, and phonological skills predicted word attack, deficits in both variables would impede both aspects of reading, leaving no compensatory route easily available." (p.13)

Source: Wolf, M. (1999). What time may tell: Towards a new conceptualization of developmental dyslexia. *Annals of Dyslexia, 49*, 3-27.

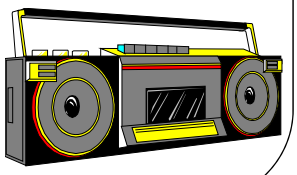
Triple-Deficit Hypothesis



Phonological Awareness

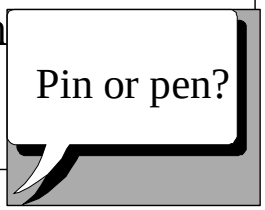
Knowing that spoken language is composed of sounds

The ability to manipulate and integrate language sounds



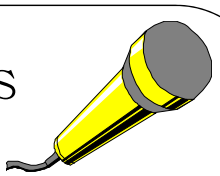
A phoneme...

- is the basic building block of speech
- is a single speech sound that changes the meaning of a word
- helps us distinguish one word from another



Poor Phonological Processing

Mispronounces words



Trouble sequencing sounds in spelling

Confusion of similar sounding sounds

Research Results

Phonemic awareness...
- is highly related to reading achievement and causes reading failure

Phonemic awareness training...
- reduces reading failure
- provides long lasting benefits

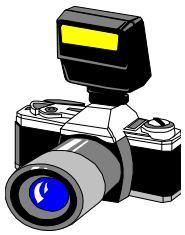
Orthography…..

is the system of marks that make up a printed language. For the English language, orthography includes upper and lower case letters, numerals, and punctuation marks" (p. 245).

Wagner, R. K., & Barker, T. A. (1994). *The development of orthographic processing ability. In V. W. Berninger (Ed.) The varieties of orthographic knowledge I: Theoretical and developmental issues* (pp. 243-276). Dordrecht, The Netherlands: Kluwer.

Orthographic Awareness

Rapid and accurate formation of letter images, letter strings, or word images in memory



Orthographic: the visual representations specific to words (not visual-spatial skills)

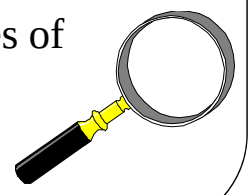
Orthographic coding: Representing a printed word in memory and accessing the whole word, a letter cluster, or a letter.

Orthographic image: Representation of a specific written word in memory .

Source: Berninger, V. W. (1996). *Reading and writing acquisition: A developmental neuropsychological perspective*. Boulder, CO: Westview Press.

Poor Orthographic Processing

Reverses letter and numbers
Has trouble copying
Has trouble remembering sight words
Confuses low-image words (e.g., of and for)
Has difficulty learning how to form letters
Confuses similar-looking letters and words
Spells phonetically and violates rules of English spelling
Has a slow reading rate



In describing an intelligent 14-year old boy:

"He seems to have no power of preserving and storing up the visual impression produced by words - hence the words, though seen, have no significance for him. His visual memory for words is defective or absent; which is equivalent to saying that he is what Kussmaul has termed "word blind." I may add that the boy is bright and of average intelligence in conversation...

The schoolmaster who has taught him for some years says that he would be the smartest lad in the school if the instruction were entirely oral."

(p. 94). -Pringle Morgan (1896)

Phonology versus Orthography

Phonology: the sounds of a language

Orthography: the marks of a writing system, including the spelling patterns of a language

Reading and spelling words and nonwords that adhere to English spelling rules requires both abilities.

Woodcock-Johnson® III

Tests of Achievement Form C/Brief Battery

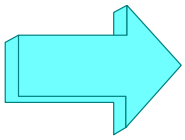
The Relationship Between Phonology and Orthography

Making the connections between speech sounds (phonemes) and graphemes (printed letters and letter strings)

How many phonemes and graphemes are in English?

The Alphabetic Principle

The systematic use of alphabetic letters to represent speech sounds

F  /F/

grapheme

phoneme

How speech sounds map to print

What is Rapid Automatized Naming (RAN)?

Measures response time or rapid retrieval for a visual stimulus (objects, colors, letters, or numbers or a combination)

6 8 9 6 4 9 3 6 9 4

8 1 3 9 6 8 4 3 1 9

What Do Rapid Naming Tests Appear to Measure?

1. Ability to sustain attention to process and name the symbols.
2. Ability to name and discriminate among the symbols.
3. Ability to retrieve verbal labels rapidly.
4. Ability to articulate words rapidly.

What Do We Know about Rapid Naming?

1. Appears to be distinct from phonology.
2. Accounts for independent variance in word-reading accuracy and speed.
3. Is a stronger predictor of irregular word reading than non-word reading skill.
4. Is a powerful predictor for poor readers across the lifespan.

The deficit in serial naming speed appears specific to children with dyslexia.

It is not clear how the naming speed deficit affects reading progress.

Naming deficits appear to be either a dysfunction in lower-level visual processes or part of more general processing speed deficits.

Source: Wolf, M., & Bowers, P. G. (1999). The double-deficit hypothesis for the developmental dyslexias. *Journal of Educational Psychology, 91*, 415-438.

People who study the correlates of reading must distinguish between predictors and requisite abilities (i.e.,indispensable parts)

Hammill,1999,

personal communication

Processing Speed

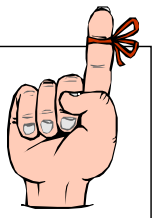
Involves the serial scanning of print

Can be related to poor attention, slow RAN, poor orthography, inefficient visual tracking

Appears related to the development of automaticity with basic skills

Dyslexia

a problem with rapid word identification and/or spelling

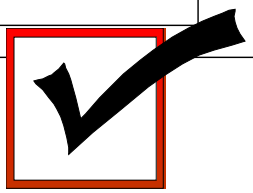


caused by poor phonological and/or orthographical awareness

treatment requires specialized methods and accommodations

Dyslexia

The term "**dyslexia**" implies:



a biological basis for the difficulty

difficulties with mastery of the coding aspects of reading and/or spelling (persistent spelling difficulties)

a complex syndrome, as opposed to one isolated symptom (e.g., only poor reading)

Dyslexia creates a breakdown in the acquisition and application of alphabetic knowledge (phonology and/or orthography) that results in slow, labored reading development, delayed automaticity, and poor spelling. The treatment requires direct, intensive instruction in the alphabetic system, followed by methods to build rate and fluency (Mather, 2000).

"...this new conceptualization of reading disabilities was ironically, named too quickly. To be sure, double deficit captures the phenomenon of study--that is, the importance of understanding the separate and combined effects of two core deficits--but it fails miserably in redirecting our simultaneous attention as a field to the entire profile of strengths and limitations manifest in children with reading disabilities. Only when we develop truly multi- dimensional models of deficits and strengths will our diagnostic and remedial efforts be best matched to individual children" (p.23).

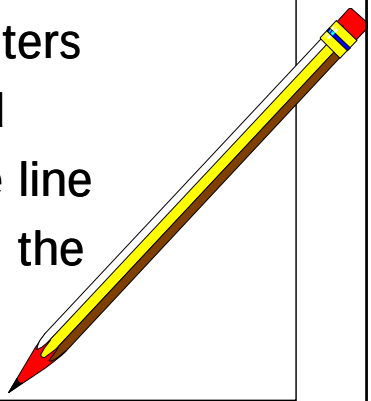
Source: Wolf, M. (1999). What time may tell: Towards a new conceptualization of developmental dyslexia. *Annals of Dyslexia, 49,* 3-27.

"The history of dyslexia research, the heterogeneity of our dyslexic children, and the very complexity of the reading process argue against any single-factor, two-factor, or even three-factor explanation (p. 5)."

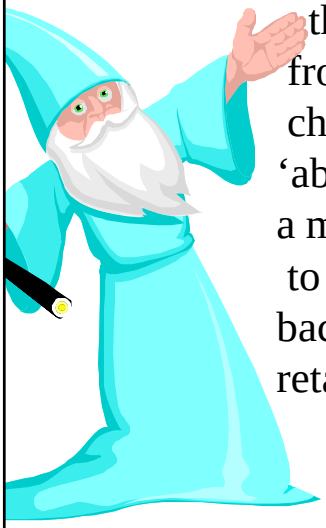
Source: Wolf, M. (1999). What time may tell: Towards a new conceptualization of developmental dyslexia. *Annals of Dyslexia, 49,* 3-27.

Visual Motor

- Difficulty forming letters correctly
- Inconsistent size of letters
- Slow production speed
- Trouble staying on the line
- Too much pressure on the pencil



Consider other abilities that are not easily assessed by standardized tests… such as creativity, resourcefulness…



"If a benevolent wizard were to give me the power to eliminate four words from the tester's vocabulary, I would choose 'intelligence,' 'aptitudes,' 'abilities,' and 'achievement.' Then if a malevolent wizard were suddenly to appear and demand that I take back one word, I would chose to retain 'abilities.' (p. 1)

-Anastasi (1980)

"…(a) major value of detecting severe discrepancies within and between areas of cognition is the focus on cognitive processing components of learning disabilities."

(Brackett & McPherson, 1996)

- The child fails to achieve a rate of learning to make sufficient progress to meet State-approved results in one or more of the areas identified in paragraph (a)(1) of this section when assessed with a response to scientific, research-based intervention process

OR

- The child exhibits a pattern of strengths and weaknesses in performance, achievement, or both, relative to intellectual development, that is determined by the team to be relevant to the identification of a specific learning disability.

Name: Carlos
Date of Birth: 01/14/1998
Age: 8 years, 10 months
Date of Testing: 11/04/2006
School: Home
Grade: 3.2
Examiner: N. Mather

Woodcock-Johnson III Tests of Achievement
Norms based on grade 3.2

CLUSTER/Test	GE	Proficiency	RPI	PR	SS(68% BAND)
ORAL LANGUAGE (Ext)	*5.1*	*avg to adv*	*96/90*	*80*	*113 (109-116)*
ORAL EXPRESSION	*5.3*	*avg to adv*	*95/90*	*77*	*111 (106-116)*
LISTENING COMP	*4.9*	*avg to adv*	*96/90*	*79*	*112 (107-br*
BROAD READING	*2.0*	*limited*	*27/90*	*10*	*81 (79-83)*
BROAD MATH -	*2.8*	*average*	*84/90*	*37*	*95 (92-98)*
BROAD WRITTEN LANG	*1.4*	*limited*	*35/90*	*3*	*72 (68-77)*
BASIC READING SKILLS	*2.4*	*limited*	*52/90*	*21*	*88 (85-90)*
READING COMP	*1.6*	*limited*	*29/90*	*9*	*79 (77-82)*
MATH CALC SKILLS	*2.3*	*lmtd to avg*	*76/90*	*22*	*89 (84-93)*
MATH REASONING	*2.8*	*average*	*84/90*	*40*	*96 (93-100)*
BASIC WRITING SKILLS	*1.7*	*limited*	*32/90*	*7*	*78 (74-82)*
WRITTEN EXPRESSION	*1.5*	*limited*	*50/90*	*4*	*74 (67-80)*
ACADEMIC SKILLS	*2.1*	*limited*	*37/90*	*8*	*79 (75-82)*
ACADEMIC FLUENCY	*1.6*	*limited*	*45/90*	*5*	*75 (72-79)*
ACADEMIC APPS	*2.2*	*lmtd to avg*	*68/90*	*22*	*88 (85-91)*
ACADEMIC KNOWLEDGE	*4.4*	*avg to adv*	*96/90*	*75*	*110 (104-116*
PHON/GRAPH KNOW	*2.2*	*lmtd to avg*	*77/90*	*32*	*93 (90-95)*

Intra-Achievement Variations

	Actual	Predicted	Diff	PR	SD	+ or - 1.50 SD(SEE)
BASIC READING SKILLS	*88*	*93*	*-5*	*27*	*-0.60*	*No*
READING COMP	*79*	*95*	*-16*	*5*	*-1.64*	*Yes*
MATH CALC SKILLS	*89*	*95*	*-6*	*28*	*-0.57*	*No*
MATH REASONING	*96*	*93*	*3*	*63*	*+0.34*	*No*
BASIC WRITING SKILLS	*78*	*95*	*-17*	*6*	*-1.59*	*Yes*
WRITTEN EXPRESSION	*74*	*96*	*-22*	*2*	*-2.03*	*Yes*
ORAL EXPRESSION	*111*	*93*	*18*	*94*	*+1.54*	*Yes*
LISTENING COMP	*112*	*92*	*20*	*95*	*+1.62*	*Yes*
ACADEMIC KNOW	*110*	*92*	*18*	*94*	*+1.58*	*Yes*

*Oral Language/Achievement Discrepancies**

	Actual	Predicted	Diff	PR	SD	+ or - 1.50 (SEE)
BROAD READING	*81*	*106*	*-25*	*2*	*-2.07*	*Yes*
BASIC READING SKILLS	*88*	*106*	*-18*	*6*	*-1.60*	*Yes*
READING COMP	*79*	*106*	*-27*	*1*	*-2.18*	*Yes*
BROAD MATH	*95*	*106*	*-11*	*20*	*-0.83*	*No*
MATH CALC SKILLS	*89*	*104*	*-15*	*12*	*-1.15*	*No*
MATH REASONING	*96*	*107*	*-11*	*19*	*-0.86*	*No*
BROAD WRITTEN LANG	*72*	*106*	*-34*	*1*	*-2.47*	*Yes*
BASIC WRITING SKILLS	*78*	*105*	*-27*	*2*	*-2.01*	*Yes*
WRITTEN EXPRESSION	*74*	*104*	*-30*	*1*	*-2.37*	*Yes*
ACADEMIC KNOWLEDGE	*110*	*108*	*2*	*58*	*+0.21*	*No*

**These discrepancies compare Oral Language (Ext) with Broad, Basic, and Applied ACH clusters.*

WJ III Cognitive for Carlos

CLUSTER/Test	GE	RPI	PR	SS(68% BAND)
GIA (Ext) -	***2.1***	***81/90***	***25***	***90 (88-92)***
VERBAL ABILITY (Ext)	***5.0***	***97/90***	***85***	***115 (111-120)***
THINKING ABILITY (Ext)	***2.8***	***88/90***	***43***	***97 (95-100)***
COG EFFICIENCY (Ext)	***K..9***	***24/90***	***2***	***68 (65-72)***
COMP-KNOWLEDGE (Gc)	***5.0***	***97/90***	***85***	***115 (111-120)***
L-T RETRIEVAL (Glr)	***1.6***	***82/90***	***12***	***83 (79-87)***
VIS-SPATIAL THINK (Gv)	***2.3***	***86/90***	***35***	***94 (90-99)***
AUDITORY PROCESS (Ga)	***4.2***	***92/90***	***58***	***103 (98-108)***
FLUID REASONING (Gf)	***3.3***	***91/90***	***53***	***101 (97-105)***
PROCESS SPEED (Gs)	***K.8***	***11/90***	***1***	***62 (59-65)***
SHORT-TERM MEM (Gsm)	***1.1***	***44/90***	***11***	***82 (77-87)***
WORKING MEMORY	***1.4***	***52/90***	***12***	***83 (78-87)***
COGNITIVE FLUENCY	***<K.0***	***26/90***	***1***	***64 (62-66)***
KNOWLEDGE -	***4.7***	***97/90***	***82***	***114 (109-119)***

Intra-Individual Variations

	Actual	Predicted	Diff	PR	SD	+ or - 1.50 SD (SEE)
COMP-KNOW (Gc)	*115*	*90*	*25*	*99.5*	*+2.59*	*Yes*
L-T RETRIEVAL (Glr)	*83*	*93*	*-10*	*21*	*-0.79*	*No*
VIS-SPATIAL THINK (Gv)	*94*	*96*	*-2*	*46*	*-0.11*	*No*
AUDITORY PROCESS (Ga)	*103*	*94*	*9*	*75*	*+0.66*	*No*
FLUID REASONING (Gf)	*101*	*93*	*8*	*75*	*+0.67*	*No*
PROCESS SPEED (Gs)	*62*	*96*	*-34*	*1*	*-2.36*	*Yes*
SHORT-TERM MEM (Gsm)	*82*	*95*	*-13*	*16*	*-0.99*	*No*
WORKING MEMORY	*83*	*95*	*-12*	*17*	*-0.97*	*No*
BASIC READING SKILLS	*88*	*93*	*-5*	*30*	*-0.54*	*No*
READING COMP	*79*	*94*	*-15*	*8*	*-1.43*	*No*
MATH CALC SKILLS	*89*	*95*	*-6*	*30*	*-0.51*	*No*
MATH REASONING	*96*	*92*	*4*	*66*	*+0.41*	*No*
BASIC WRITING SKILLS	*78*	*95*	*-17*	*7*	*-1.51*	*Yes*
WRITTEN EXPRESSION	*86*	*94*	*-8*	*22*	*-0.76*	*No*
ORAL EXPRESSION	*111*	*92*	*19*	*94*	*+1.58*	*Yes*
LISTENING COMP	*112*	*91*	*21*	*96*	*+1.76*	*Yes*
ACADEMIC KNOWLEDGE	*110*	*92*	*18*	*94*	*+1.56*	*Yes*

General Intellectual Ability to ACH

	Actual	Predicted	Diff	PR	SD	+ or - 1.50 SD (SEE)
BROAD READING	*81*	*93*	*-12*	*14*	*-1.09*	*No*
BASIC READING SKILLS	*88*	*95*	*-7*	*27*	*-0.60*	*No*
READING COMP	*79*	*94*	*-15*	*9*	*-1.33*	*No*
BROAD MATH	*95*	*95*	*0*	*51*	*+0.03*	*No*
MATH CALC SKILLS	*89*	*96*	*-7*	*28*	*-0.59*	*No*
MATH REASONING	*96*	*94*	*2*	*57*	*+0.19*	*No*
BROAD WRITTEN LANG	*79*	*95*	*-16*	*8*	*-1.43*	*No*
BASIC WRITING SKILLS	*78*	*94*	*-16*	*8*	*-1.40*	*No*
WRITTEN EXPRESSION	*86*	*94*	*-8*	*22*	*-0.76*	*No*
ORAL LANGUAGE (Ext)	*113*	*94*	*19*	*95*	*+1.66*	*Yes*
ORAL EXPRESSION	*111*	*95*	*16*	*92*	*+1.43*	*No*
LISTENING COMP	*112*	*94*	*18*	*93*	*+1.44*	*No*
ACADEMIC KNOWLEDG	*110*	*94*	*16*	*93*	*+1.51*	*Yes*

**These discrepancies compare GIA (Ext) with Broad, Basic, and Applied ACH clusters.*

What's Right with Whole Language?

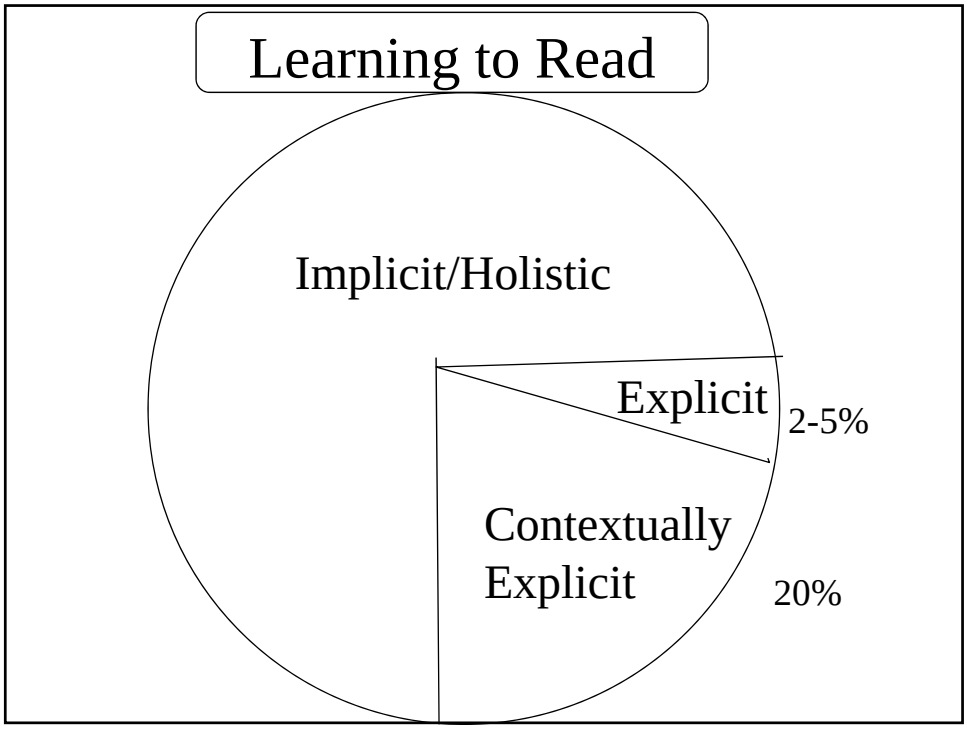
Child centered and motivating

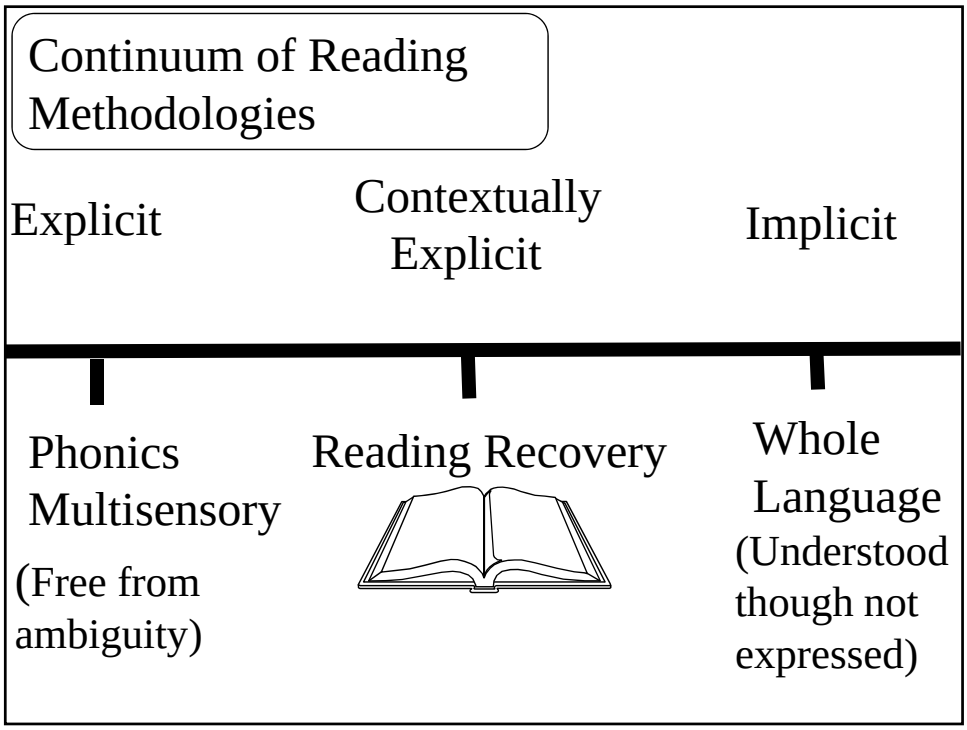
High-interest and authentic text

Interactive: Language-rich environment

Emphasis on meaning and language

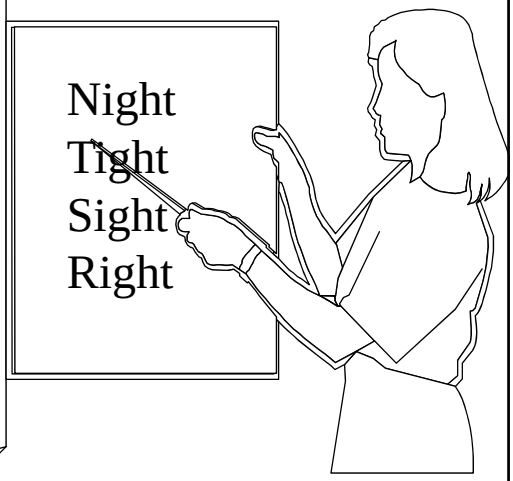
Reading develops naturally


Learning to Read
Implicit/Holistic
Explicit
2-5%
Contextually
Explicit
20%


Continuum of Reading
Methodologies
Explicit
Contextually
Explicit
Implicit
Phonics
Multisensory
(Free from
ambiguity)
Reading Recovery
Whole
Language
(Understood
though not
expressed)

Formal Reading Instruction

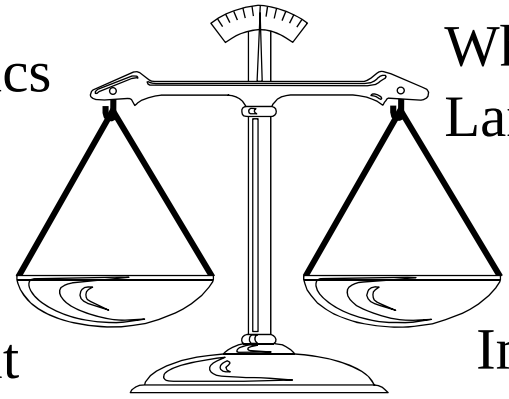
Direct
Structured
Systematic
Repetitious
Controlled
Intensive



A Balanced Approach

Phonics

Whole Language



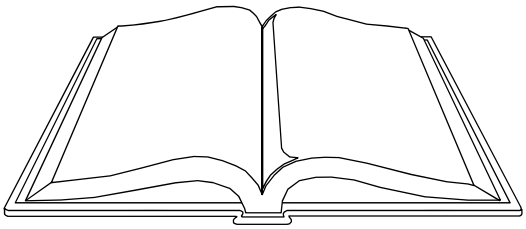
Explicit

Implicit

Margaret Rawson's description of how to teach children with dyslexia:

"Dyslexic students need a different approach to learning language from that employed in most classrooms. They need to be taught, slowly and thoroughly, the basic elements of their language- the sounds and the letters which represent them- and how to put these together and take them apart. They have to have their writing hands, eyes, ears, and voices working together in conscious organization and retention of their learning (as cited in Henry, 1998, p. 1).

There are no bad methods. There are only bad matches.



Decoding is at once the least and yet the most important aspect of reading…

-Gerald Glass, 1973

Methods for Building Decoding

Sight Words	**Places emphasis on quick recognition without phonic analysis**
Synthetic Phonics	**Begins with single phonemes and graphemes**
Analytic Phonics	**Begins with word families**
Multisyllabic	**Uses structural analysis and syllabication**
Multisensory	**Employs multiple senses, often tracing**
Fluency	**Focuses on rate and automaticity**

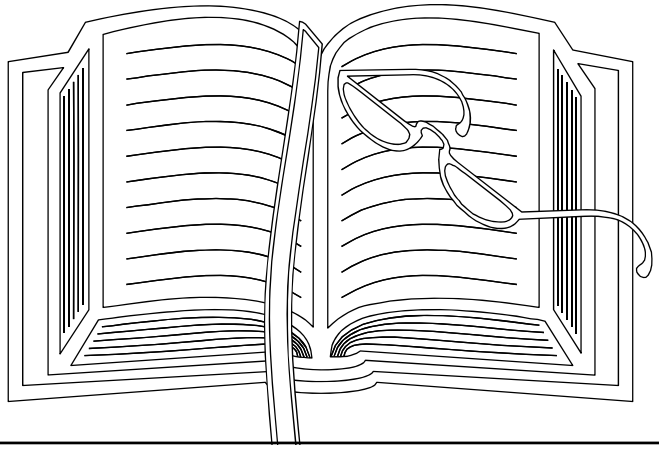
Report of the National Reading Panel (April 13, 2000)

Most effective instruction includes a combination of methods, including:

- Activities to build phonemic awareness
- Instruction in letter-sound correspondences (phonics)
- Guided oral reading (reading aloud with feedback)
- Application of reading comprehension strategies

www.nationalreadingpanel.org

Different People require Different Approaches at Different Developmental Stages



Poor readers have difficulty…

Understanding and learning letter-sound relationships

Using phonics to pronounce words

Strategies for Word Identification

1. By segmenting and blending sounds.
2. By pronouncing common spelling units (e.g., syllables).
3. By recognizing sight words from memory.
4. By creating analogies to known words.
5. By using context cues to predict words.

Skilled Reading

The key to efficient text reading is automaticity (the ability to read words by sight automatically). Allows readers to process words in text quickly w/o conscious attention to words. All other cuing systems require conscious attention.

Ehri, L. C. (1998*). Grapheme-phoneme knowledge is essential for learning to read words in English.* In J. L. Metsala & L. C. Ehri (Eds.), *Word recognition in beginning literacy (pp. 3-40)*. Mahwah, NJ: Lawrence Erlbaum.

Phases of Sight Word Development

Pre-Alphabetic Phase

Partial Alphabetic Phase

Full Alphabetic Phase

Consolidated Alphabetic Phase

Ehri, L. C. (1998). *Grapheme-phoneme knowledge is essential for learning to read words in English*. In J. L. Metsala & L. C. Ehri (Eds.), *Word recognition in beginning literacy (pp. 3-40)*. Mahwah, NJ: Lawrence Erlbaum.

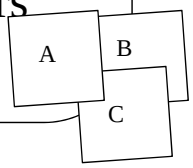
Pre-Alphabetic Phase

Makes connection between salient visual cues and word meaning

Does not use letter-sound relations to aid in word identification

Partial Alphabetic

Makes connections between some of the letters and sounds
Relies more on first and final sounds
Lacks full knowledge of alphabetic system, particularly vowels
Reads same word inconsistently and confuses words with similar letters (e.g., cap and camp)



Full Alphabetic

Has complete connections between letters and phonemes

Can decode words never read before by segmenting and blending letters

Remembers how to read sight words

Consolidated Alphabetic

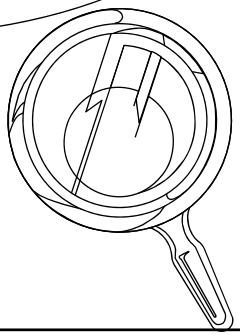
Recognizes larger letters units instantly (e.g., morphemes, syllables, onset/rimes)

Has consolidated units in memory (e.g., -est, -tion, -ing, -le)

Is sensitive and recalls spelling patterns observed in words

Reads words rapidly and easily

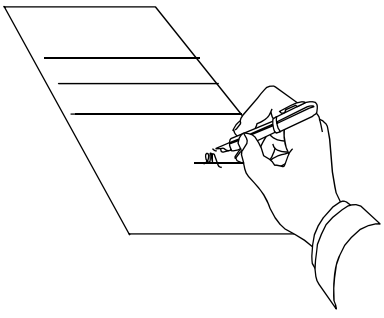
Decoding and Encoding Require Similar Processes, but Encoding is Much More Difficult



Development of Encoding Skill

Print Awareness
Phonological Awareness
Alphabetic Principle
Increased Orthographic Awareness
- Syllables
- Visual Patterns

Automaticity



Strategy Theory of Spelling Development

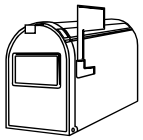
Children use information from phonology, orthography, and morphology as an aid to spelling from the beginning of attempted spellings.

Stages of Spelling Development

- **Prephonetic:** Has no knowledge of the alphabetic principal
- **Semi-phonetic:** Uses letters to represent easy to hear speech sounds
- **Phonetic:** Represents all speech sounds
- **Transitional:** integrates some orthographic patterns
- **Conventional:** Uses sounds, patterns, and meanings

Examples of Stages of Development

Pre-phonetic: w12m



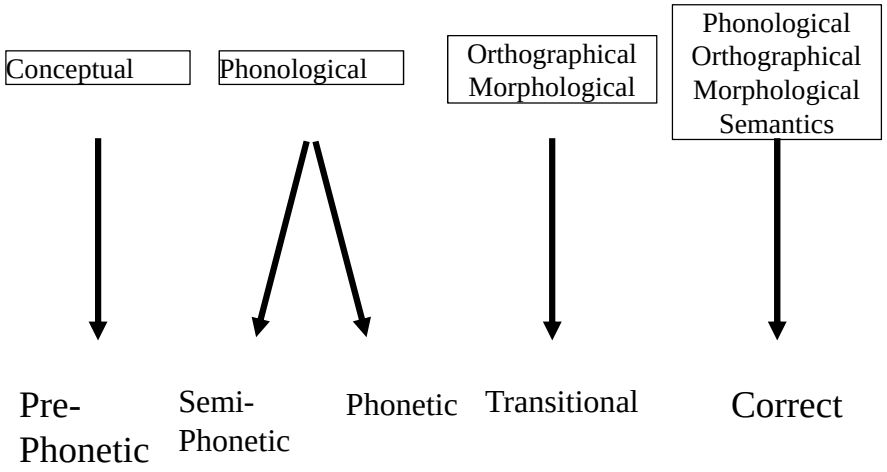
Semi-phonetic: I wk t the madk.

Phonetic: I wokt to the maylbocks.

Transitional: I waked two the malebox.

Conventional: I walked to the mailbox.

Primary Abilities for Spelling Development



Stages of Decoding/Encoding Development

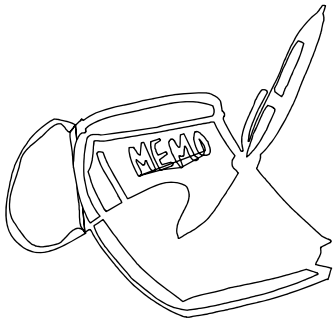
Prealphabetic: Prephonetic

Partial alphabetic: Semi-phonetic

Full alphabetic: Phonetic

Consolidated: Transitional (orthography)

Fluency: Conventional



Comprehensive Assessment of Basic Reading and Writing Skills

Phonological awareness
Rapid naming
Letter-sound relationships
Pseudoword reading and spelling
Exception word reading and spelling
Multisyllabic words (structural analysis)
Rate and automaticity
Oral language abilities

Using Oral Language-Ext as the Ability Measure

Determine if oral language is above or similar to academic performance.

Assumption is that verbal abilities and listening comprehension should be similar to reading and writing performance.

If both are low, direct intervention to all aspects of language. If only reading or writing is low, direct intervention to reading and/or writing.

Can use to provide a justification for an accommodation (e.g., books on tape, oral exams).

Sequence of Skill Development

- Discriminating rhymes
- Producing rhymes
- Isolating initial and final sounds
- Blending sounds
- Segmenting sounds
- Manipulating sounds (e.g., deleting, substituting, transposing)

How many phonemes do you hear in...?

pig

rabbit

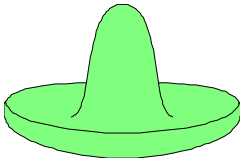
rooster

sheep

box

Onsets and Rimes

Parts of the English syllable



First part: Onset H...at

Second part: Rime h...AT

In English, all syllables have a rime, but not necessarily an onset

Rimes or Phonograms

Common element in word families (e.g., the “at” in cat)

Awareness of syllables and onsets and rimes develops before an awareness of phonemes

To teach rimes, use activities that stress rhyming patterns

37 rimes from which 500 primary words can be taught using analytic phonics.

Wylie & Durrell, 1972

-ack -all -ain -ake -ale -ame -an

-ank -ap -ash -at -ate -aw -ay

-eat -est -ice -ick -ide -ight -ill -in

-ine -ing -ink -ip -it -ock -oke -op

-ore -ot -uck -ug -ump -unk

Sound Blending

Ability to push together sounds

Begin with sounds that can be prolonged (e.g., /s/,/ f/, /m/)
Progress from compound words to syllables to onset-rimes to phonemes
Present words with two sounds, three, and then four (e.g., /sh/ /oe/, /c/ /a/ /t/, /s/ /a/ /n/ /d/)
Gradually increase the interval between sounds from 1/4 second to 1 second break

Segmentation

1. Break compound words into words (e.g., cup-cake.)
2. Count the number of syllables in a word (e.g., car-pent-er.)
3. Break into onset-rime (e.g., c- at).
4. Count the number of phonemes (e.g., s-e-g-m-e-n-t).

Segmentation

Ability to separate sounds

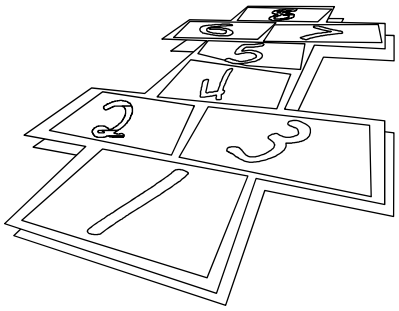
Manipulatives (e.g., tiles, poker chips)
Tap out the number of words, syllables, phonemes
Hold up fingers to count the number of phonemes

Clap, Tap, or Jump the Number of...

words in a sentence

syllables in words

phonemes in words



Synthesis to Analysis
Analysis to Synthesis

- Distinctly say a word phoneme by phoneme
- Have children represent phonemes with blocks
- Have children say the whole word
- Say a word and have the children represent sounds with blocks

Phoneme Manipulation

Deletion: say carp without the /p/

Addition: say at with /c/ at the front

Substitution:

- Initial: Change the /s/ in sun to /f/
- Final: Change the /t/ in cat to /b/
- Medial: Change the /i/ in hit to /a/

Reversal: say the sounds in "enough" backward

Early Reading

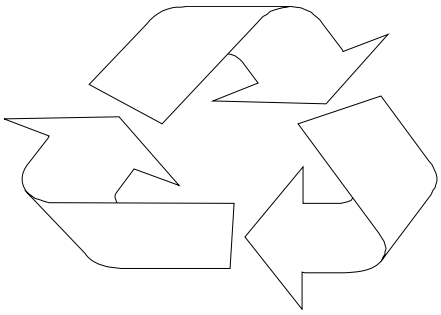
Print awareness

Phonological awareness

Terminology

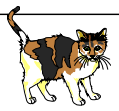
Alphabetic principle

Reciprocal Relationship between Phonological Awareness and Reading and Spelling Development



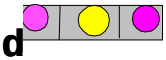
Adapted Elkonin Procedure (Pre-Alphabetic)

1. **Select a simple line drawing.**



2. **Place a rectangle for a word under the drawing divided into squares equal to number of phonemes.**

3. **Say the word slowly and push a marker forward for each sound.**



4. **Color-code markers for vowels and consonants.**

C | A | T

5. **Progress to letter tiles for markers.**
6. **Introduce common spelling patterns (e.g. blends).**

"You have to use your brain in my job: After all, you have to know all of the letters."

Vanna White, 1995
Wheel of Fortune

Making Words

Source: Cunningham, P.M., & Cunningham, J. W. (1992). Making words: Enhancing the invented spelling-decoding connection. *Reading Teacher, 46*, 106-115.

- **Give each student 6-8 letters with one or two vowels.**
- **Have each student make 2 then 3 letters words using the letters.**
- **Continue a pattern, increasing word length one letter during each step.**
- **Example: it, sit, slit, split, splint**
- **Practice with morphemes: ed, ing, er**

Modifying Making Words

- **Focus on CVC patterns**
- **Progress from changing initial to final to medial sounds**
- **Integrate with a reading/writing activity**
- **Pair at-risk student with tutor**

Talk-to-Yourself Chart

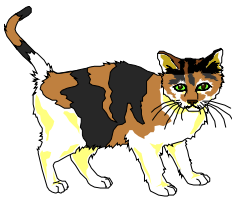
(Adapted from Benchmark School, Gaskins)

1. **The word is _____.**
2. **When I stretch the word, I hear _____ sounds.**
3. **There are _____ letters because _____.**
4. **The spelling pattern is _____.**
5. **This is what I know about the vowel:_____.**
6. **Another word I know with the same vowel sound is:_____.**
7. **Other words that share this same spelling pattern are:_____.**

1. The word is right.
2. When I stretch the word, I hear 3 sounds.
3. There are 5 letters because it takes i-g-h to represent the i sound.
4. The spelling pattern is ight.
5. This is what I know about the vowel: the vowel is the only vowel in the word and it says its own name.
6. Another word that I know with the same vowel sound is: ride.
7. Other words that share this same spelling pattern are: light, night, might, tight, sight, plight, fight, flight,and fright

Synthetic Phonics

- Explicit approach
- Teach grapheme-phoneme correspondences
- Teach blending
- Demonstrate how words are made from known parts



C-A-T

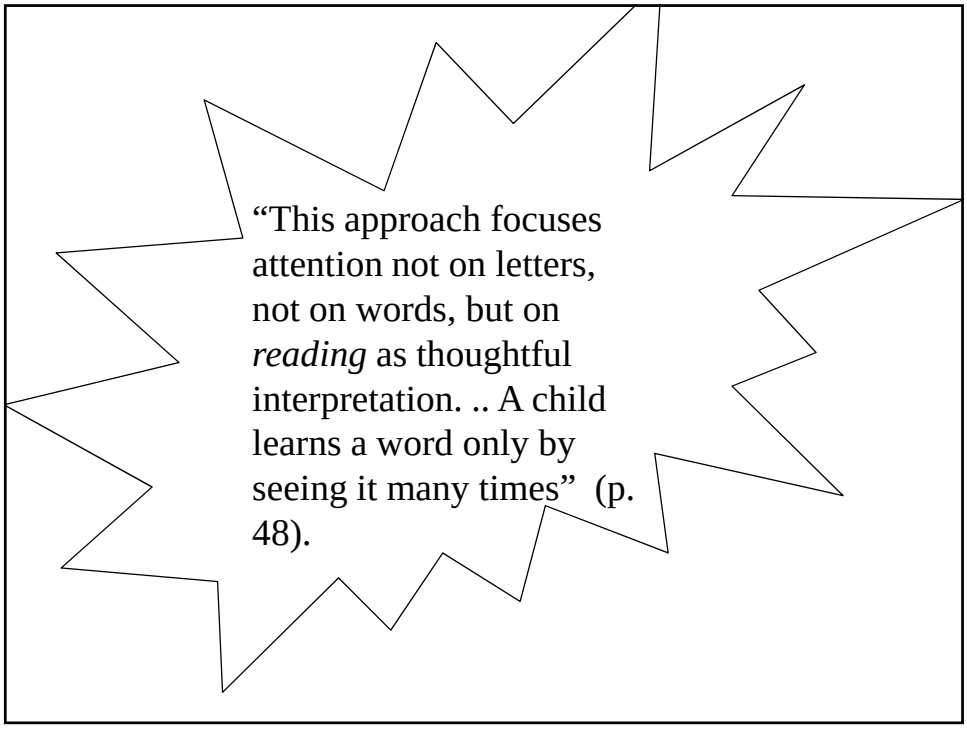
H-A-T

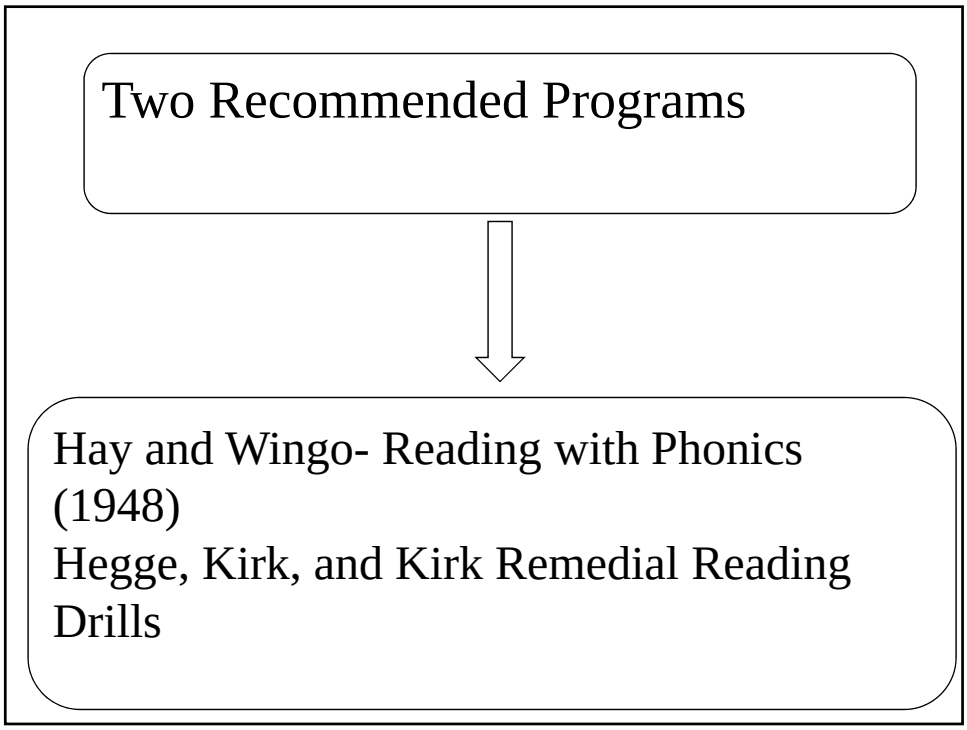
Examples of Effective Synthetic Phonics Programs

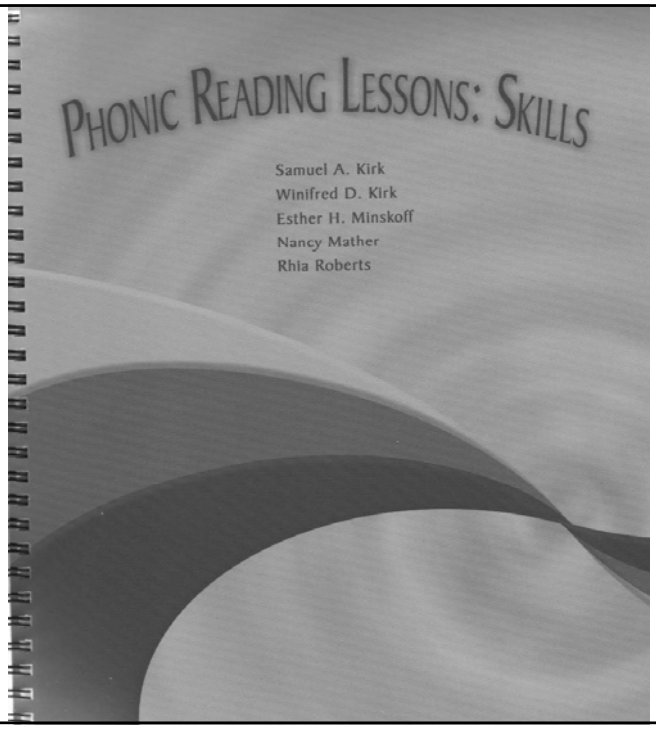
- Stevenson Language Program
- Phonic reading lessons
- Spalding method
- Corrective Reading
- Lindamood Phonemic Sequencing Program for Reading, Spelling, and Speech
- Slingerland
- Orton-Gillingham
- Wilson Reading System
- Language!

"It seems to me a plain fact that the word method consists essentially of treating children as if they were dogs. It is not a method of teaching at all; it is clearly a method of animal training. It's the most inhuman, mean, stupid way of foisting something on a child's mind." (p. 112).

"Mind you, I am not accusing the reading 'experts' of wickedness or malice. I am not one of those people who call them un-American or left-wingers or Communist fellow travelers. All I am saying is that their theories are wrong and that the application of those theories has done untold harm to our younger generation." (p. 118).


"This approach focuses attention not on letters, not on words, but on *reading* as thoughtful interpretation. .. A child learns a word only by seeing it many times" (p. 48).


Two Recommended Programs
Hay and Wingo- Reading with Phonics (1948)
Hegge, Kirk, and Kirk Remedial Reading Drills



Phonic Reading Lessons (2007)

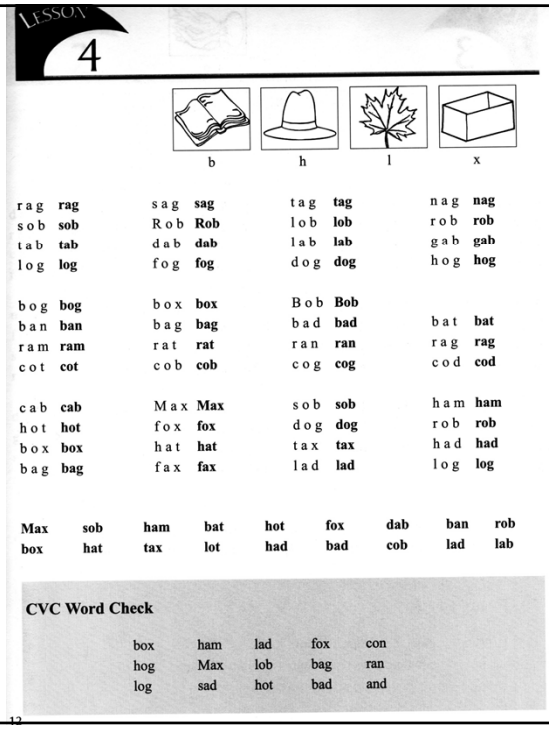
Academic Therapy Publications, 20 Commercial Blvd.,
Novato, CA 94949-6191, 800-422-7249

- **7 or more years of age**
- **been in school at least one year**
- **sufficient oral language**
- **educationally significant reading problem**
- **have not learned to decode**

Scope and Sequence of Phonic Reading Lessons

- Unit I: Short vowels, CVC words
- Unit II: CVCe and consonant digraphs
- Unit III: Consonant blends and digraphs
- Unit IV: R-controlled vowels, vowel digraphs
- Unit V: Common word endings and spelling rules
- Unit VI: Alternative pronunciations and spellings
- Unit VII: Prefixes
- Unit VIII: Suffixes
- Unit IX: Latin roots
- Unit X: Greek roots

Academic Therapy Publications ,20 Commercial Blvd.
Novato, CA 94949 (800) 422-7249,
www.AcademicTherapy.com



LESSON 4

b h l x

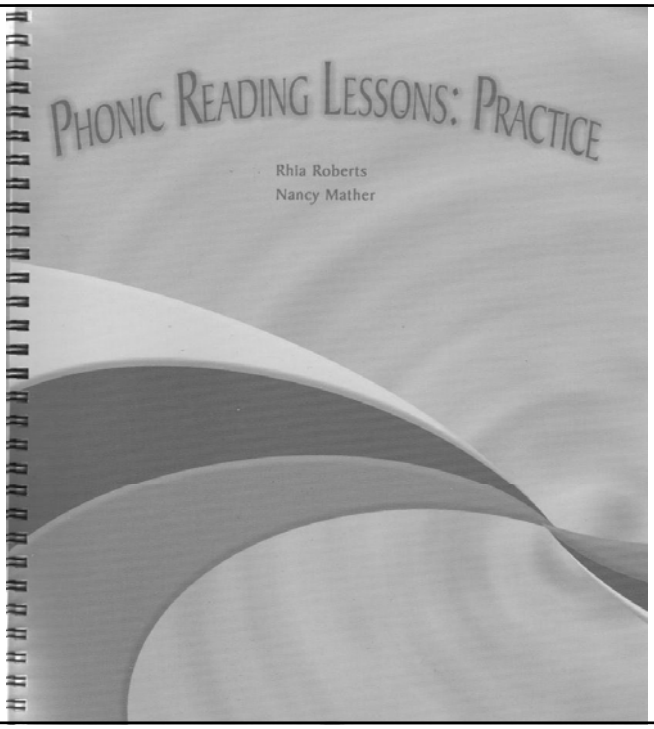
rag rag	sag sag	tag tag	nag nag
sob sob	Rob Rob	lob lob	rob rob
tab tab	dab dab	lab lab	gab gab
log log	fog fog	dog dog	hog hog
bog bog	box box	Bob Bob	
ban ban	bag bag	bad bad	bat bat
ram ram	rat rat	ran ran	rag rag
cot cot	cob cob	cog cog	cod cod
cab cab	Max Max	sob sob	ham ham
hot hot	fox fox	dog dog	rob rob
box box	hat hat	tax tax	had had
bag bag	fax fax	lad lad	log log

Max	sob	ham	bat	hot	fox	dab	ban	rob
box	hat	tax	lot	had	bad	cob	lad	lab

CVC Word Check

box	ham	lad	fox	con
hog	Max	lob	bag	ran
log	sad	hot	bad	and

12



LESSON 1

HIGH FREQUENCY WORDS

I the

at	mat	fan	ant	sat
tan	fat	an	man	am
fat	man	Nan	tan	fan
at	sat	an	ant	am

Nan

I am Nan.
Nan **I** am.
Am **I** Nan?
I am.

Sam

I am Sam.
I am fat.
I am **the** fat ant.
Am **I the** fat ant?
I am.
I am Sam **the** fat ant.

The Man Sat

Sam sat.
Sam **the** man sat.
Nan sat.
Nan **the** ant sat.

The Fat, Tan Ant

I am fat.
I am tan.
I am **the** fat, tan ant.

Sam the Man

I am Sam.
I am Sam **the** man.
Am **I** Sam **the** man?
I am!

Nan the Fat Ant

I am Nan.
I am Nan **the** ant.
I am Nan **the** fat ant.
Am **I** Nan **the** fat ant?
I am!

I am Sam

Sam sat.
Sam **the** man sat.
I am Sam **the** man.
I sat.

I am Nan

Nan sat.
Nan **the** ant sat.
Nan **the** fat ant sat.
I am Nan **the** fat ant.
I sat.

Am I?

Am **I the** man?
I am tan.
I am fat.
Am **I the** man?
I am the ant!

LESSON 5

HIGH FREQUENCY WORDS

of was from

bit	tin	jam	lid	him
dig	mop	did	pig	sit
hit	din	cap	hid	six
big	top	kid	rip	fit

The Fax

Pam got a fax.
It **was from** Rob.
Rob got a fax.
It **was from** Pam.
Pam got a fax and so did Rob.

The Dog

Tom had a dog.
It **was** a lab.
The dog **was from** a box.
The dog **was** not big.
He had on a dog tag.
The tag **was** not big.
On the tag **was,** "This dog is Max."

Cat Nap

Don is a cat and I am a cat.
Don and I sat on a cot.
Can you go **from** the cot, Don, so I can nap?
No? You can not go?
I **was** sad and mad so I ran and ran **from** Don and the cot.
I sat on a tan mat and I had a nap.
Don got the cot. I had the mat.

The Pot of Jam

Nip the ant sat on top **of** a pot **of** jam.
No, Nip! You can not sip the jam!
That jam **was from** dad.
Go **from** this pot of jam.
Nip the ant sat on top **of** the pot **of** jam and **was** sad.
Nip the ant ran.

Kip

Kip can hop.
Kip can sit.
He had a mom.
He had a dad.
Is Kip a kid?
No, he can sit in a hat.
Is Kip a cat?
No, he can sit in a cap.
Is Kip a rat?
No, he can sit on a pin.
Kip is an ant.

The Hot Rod

Tom had a hot rod.
It had gas.
The gas **was** in a can.
The hot rod ran and ran.
Dan and Max got in the hot rod.
The hot rod ran and ran.
It got hot.
The hot rod had no gas.
Tom **was** mad.
The hot rod can not go.

LESSON 50

1. The mouse scurried across all of the porches to get to the dirt.
2. We had planned to go camping but I got sick.
3. The soft lighting framed the painting.
4. When the van crashed, the boxes fell.
5. He won't get the grant because he has the sketchiest plans ever.
6. The trader surveyed his store with joy.
7. She had the dirtiest, most ill fitting clothes.
8. The teacher is widely loved and will be missed by all.
9. The farmer coated the old gate with paint.
10. "His parties are the noisiest," his mom stated.

Al and Din

Once upon a time in a land far, far away something so odd happened that people still talk about it today. It was a Thursday evening and…

"Pots and pans for sale. I have pots and pans for sale." Al dropped the boxes he was carrying, leaped down from the chair he was standing on, and shouted to the seller, "Are you selling lovely dishes too? I need to buy some that are not too costly."

The seller said, "Sadly, I don't have any dishes but I know the pottery maker in town has the prettiest displays I've ever seen. You won't get finer dishes anywhere." Al did not know where in the market the pottery maker was trading so he asked, "Is he the one by the horse feeder?"

The other man laughed and said, "Oh no. That trader is a robber. He takes people's cash but only sells junk to them. I mean the pottery maker by the town planner's stall." "I know it," called Al as he hopped out of his house and scurried to town.

Al was getting tired after running to town so he stopped for a rest. He hated wasting time but his legs were tired. As he sat down, he realized he was by the greedy merchant's store. He was thinking about the dishes when big crashes and shouts came from the store. "This store is both the costliest and the noisiest," said Al.

He got up, stretched, and was about to go on his way when the robber merchant ran to him and said, "Please help me. There is a mad monkey in my store." Being a good man, Al went to help.

When he saw the mess, Al felt sad for the merchant. The monkey had destroyed all the dishes. And there, on the tallest chair, sat the monkey in pants, a shirt, and a hat, calmly drinking tea from the only cup that was not in bits. Al smirked and then laughed and laughed. He had not seen anything funnier. The merchant was not laughing. "My monkey, Din, always destroys things," he said, "but this is too much this time. He has to go."

When he had stopped laughing, Al said that he would take Din if the merchant stopped robbing people. He said that if the merchant started taking people's cash again, he would bring Din back for a visit! The merchant agreed, and Al and Din left the store. That is how the greedy robber merchant mended his ways and how Al got his pet monkey.

Effective Phonics Instruction

Sound blending
A few consonants and short a
Single consonants and short vowel sounds in a VC, CVC format
CVCe pattern
Consonant blends (e.g., sc, sl, sm)
Consonant digraphs (e.g., ch, sh, th)
Vowel digraphs (e.g., oa, ee, ay)
Diphthongs (e.g., ow, ou, oi, oy)
R-controlled (e.g., ar, or, er, ir, ur)

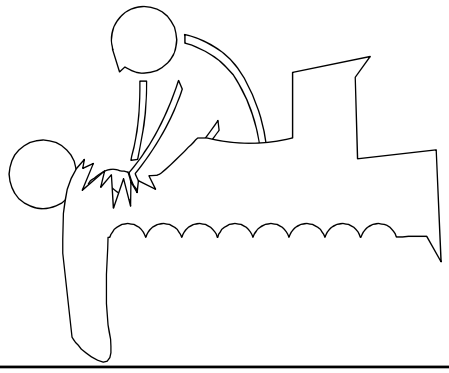
Common prefixes (e.g., re, un, mis, dis, pre, ex, sub)
Common suffixes (e.g., -er, -ly, -ful, -ed, -est, -ing, -tion)
Silent letters (e.g., kn, wr)
Latin and Greek roots

Systematic instruction in high frequency words

Principles of Effective Phonics Instruction

1. Emphasis on phonological awareness activities.
2. Instruction in decoding (grapheme to phoneme)
3. Instruction in encoding (phoneme to grapheme)
4. Application of strategies to decodable text.

"…lower level language mastery is as essential for the literacy teacher as anatomy is for the physician" (Moats, 1994, p. 99).



Good readers do not skip words. Poor readers do...

Glass Analysis Method

Easier to Learn, Box 329, Garden City, NY 11530

- Identify the whole word and ask for the word to be repeated.
- Give the sound(s) and ask for the letter(s).
- Give the letter(s) and ask for the sound.
- Take away letters or sounds and ask for the remaining sound.
- Ask for the whole word.

1. **The word is carpenter.**

2. **In the word, “carpenter,” what letters make the /er/ sound? What letters make the /ar/ sound? The /car/ sound?**

3. **What sound does the “a/r” make? the“t/e/r”? “e/n”?**

4. **In the word “carpenter,” if I took off the c/a/r (or the /car/ sound), what sound would be left. If I took off /ter/, what would be left?**
5. **What is the whole word?**

Example of letter clustering

Scratching

sc, ratch, at, ch, atch, scratch, ing ching, atching ratching

Glass Analysis for Decoding, Teacher Guide

TARGET WORDS

cat	**pat**	**bats**	**chatty**
sat	**mat**	**flat**	**chatter**
rats	**hat**	**scat**	**match**

PREVIEW WORDS

SENTENCES

1. The cat sat on a mat.
2. That will match my hat.
3. Scat, cat—off my new bat!
4. Pat the mat so it will be flat.
5. Chatty rats can chatter like bats.

QUESTIONS AND ANSWERS

1. Who sat on the new mat?	A. The fat cat sat on the mat.
2. Why are you eating so fast?	B. A kitten drinks milk.
3. Who drinks milk?	C. I want to go out and play.

REWARDS Strategy (www.rewardsreading. com

-

Circle the prefixes

Circle the suffixes

Underline the vowel in the root word

Draw scoops under the parts and say:

What part? What part? What part?

Types of Text

Decodable Text

- Phonically regular patterns
- Word families
- Careful introduction of irregularities
- Systematic review

High Frequency Word Text

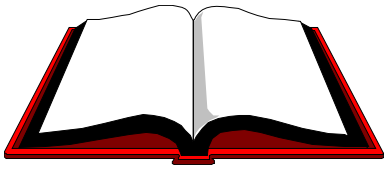
Predictable, Patterned Language

(rhymes, repeated syntactic or semantic elements)

Simple Expository Text

Characteristics of Simple Texts

- Use of high frequency words
- Use of content words
- Use of phonically regular words, including onset/rimes or word families
- Use of patterned language (repeated syntactic patterns)
- Use of pictures



Characteristics of Decodable Text

Can pronounce the words accurately by applying phonics.

New sounds are introduced systematically with careful review of previously learned sounds.

Exception words introduced slowly with considerable review.

www.accessiblebookcollection.org

www.readingatoz.com

www.starfall.com

www.soundreading.com

Reading Level Criterion:

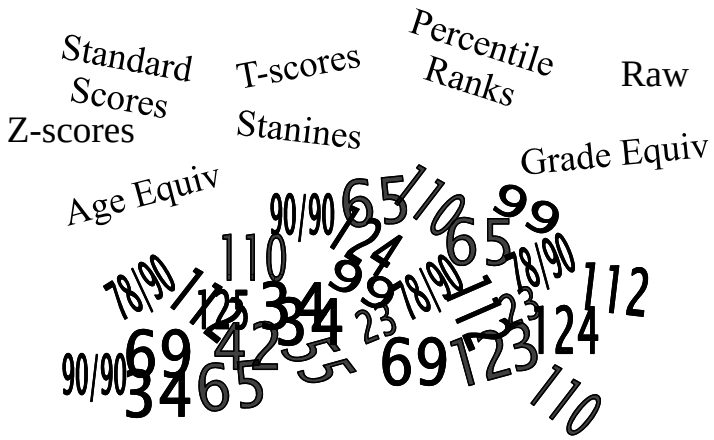
Oral Reading Fluency: (rate plus accuracy)

Independent Reading Level: **The level at which the student demonstrates word recognition 95+%.**

Instructional Reading Level: **The level at which the reader demonstrates word recognition of 90-94%.**

Frustration Reading Level: **The level at which the student demonstrates word recognition of less than 90%.**

Relative Proficiency Index



The RPI describes the quality of a person's performance on a specific task.

RPIs are analogous to the Snellen Index which describes quality of visual acuity.

Both are criterion-referenced.

Snellen criterion: 20 feet

20/20: Tim sees at 20 ft. what most other people see at 20 ft.

RPI criterion: 90% success

90/90: Tim can accomplish with 90% success what a typical age/grade-peer can accomplish with 90% success

Adapted from © Institute for Applied Psychometrics $_{llc}$ 02-14-03

Informal Reading Criteria and the RPI

96/90	**Independent**	**Easy**
90/90	Instructional	Manageable
75/90	Frustration	Difficult

Adult Age Groups

Visual Acuity	25-34	35-44	45-54	55-64	65-74	75-79
20/10+	2.1	1.5	0.7	-	-	-
20/15	50.4	49.5	18.2	4.2	0.9	-
20/20	75.1	76.7	44.6	21.0	5.7	1.5
20/30	85.5	86.3	68.3	42.8	25.0	14.6
20/40	89.1	88.8	76.6	54.6	38.3	32.2
20/50	91.0	90.3	82.9	62.9	48.2	44.5
20/70	92.0	91.9	86.2	70.0	55.1	58.0
20/100	95.6	94.7	94.5	90.2	84.0	86.0
20/200	98.6	97.1	98.3	97.9	93.2	92.0
<20/200	100+	99.4	99.8	100+	99.8	100.0

Average level of performance (50th PR)

(Data are cumulative percents from NCHS, NHS: Binocular Visual Acuity of Adults, 1960-62)

The two types of numbers are giving different types of information:

Snellen Index:

How well can you see?

Cumulative Percents:

How many people within a particular age range can see that well?

Relative Proficiency Index (RPI)

The RPI predicts a person's level of proficiency on tasks that typical age/grade-peers would perform with 90% proficiency.

Students' RPIs on Word Attack

Mark	Sam	Renee
85/90	21/90	97/90

Criterion-Referenced Interpretation of RPI Scores

W Diff Values	Reported RPIs	Proficiency	Functionality	Development	Implications
+31 and above	100/90	very advanced	very advanced	very advanced	extremely easy
+14 to +30	98/90 to 100/90	advanced	advanced	advanced	very easy
+7 to +13	95/90 to 98/90	average to advanced	within normal limits to advanced	age-appropriate to advanced	easy
-6 to +6	82/90 to 95/90	average	within normal limits	age-appropriate	manageable
-13 to -7	67/90 to 82/90	limited to average	mildly impaired to within normal limits	mildly delayed to age-appropriate	difficult
-30 to –14	24/90 to 67/90	limited	mildly impaired	mildly delayed	very difficult
-50 to -31	3/90 to 24/90	very limited	moderately impaired	moderately delayed	extremely difficult
-51 and below	0/90 to 3/90	negligible	severely impaired	severely delayed	impossible

Schrank, F.A., & Woodcock, R.W. (2003). Report Writer for the WJ III. Rolling Meadows, IL: Riverside.

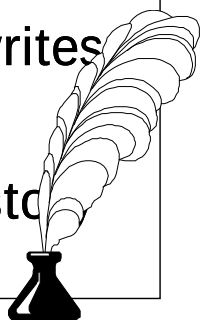
Sample Statements for Reporting RPI Scores

- Sam's RPI of 21/90 on the Phoneme/Grapheme cluster indicates that on similar tasks, in which the average fourth-grade student would be 90% successful, Sam would be 21% successful. Sam's knowledge of phoneme-grapheme correspondence and spelling patterns is very limited.
- Jeri's Fluid Reasoning RPI of 42/90 indicates that her ability to use logical reasoning to solve novel problems is mildly impaired to within normal limits. She is likely to find tasks requiring this ability to be difficult.
- Although Nicholas's standard score on the Mathematics Reasoning cluster is within the average range for seventh-grade students overall, his RPI (45/90) indicates that he will find grade-level math problem solving to be very difficult.

Mather, N., & Jaffe, L.E. (2002). WJ III: Reports, Recommendations, & Strategies. NY: Wiley

Language Experience Approach (LEA)

- Oral discussion about topic or shared experience
- Student dictates; other writes
- Teacher types story
- Student rereads written sto



Print Concepts

Print conveys meaning

Left to right tracking with return sweep

Word-by-word matching

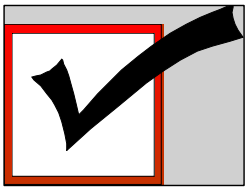
Awareness of terminology

(e.g., letters, sounds, words)

Letters represent sounds

The Fernald Method

- Stage 1: Tracing the word
  - finger contact
  - saying as tracing
  - writing from memory
  - using in context
- Stage 2: Learning by looking, saying and writing
- Stage 3: Learning directly from print
- Stage 4: Generalizing and independent reading

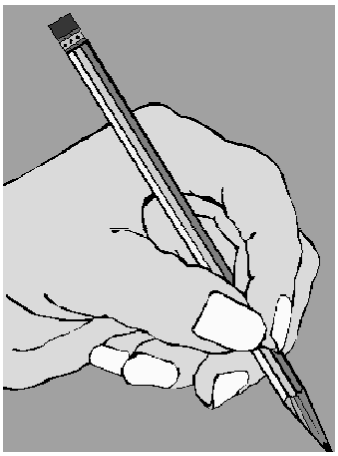


"The child is much more interested in writing and reading fairly difficult material that is on the level of his understanding than simpler material which is below his mental age level"...(p. 44)

-Grace Fernald (1943)

Tracing

- Attention
- Memory
- Sound-Symbol Association
- Handwriting

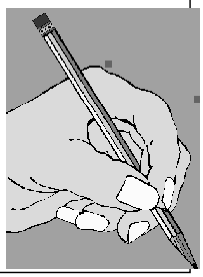


Cover-Write-Trace

- Have student look at and pronounce the word.
- Have the student trace the word while pronouncing the word slowly.
- Have the student continue tracing until the student says she knows it.
- Turn over the word and have her write the word from memory.
- Repeat until student can write the words 3 times correctly.

Principles of Spelling Instruction

- Select words at the instructional level
- Concentrate on high-frequency words
- Provide practice and review
- Use multisensory techniques when needed
- Have student practice writing from memory



Spelling Accommodations

- Reduce number of words
- Select high-frequency words
- Select phonically regular words
- Provide review
- Keep positive
- Use a spelling flow list

Spelling Flow List

- **Daily testing of a few words**
- **Keep on list until word is spelled correctly 3 days in a row**
- **Review weekly. If incorrect, add back to flow list.**
- **Select words from student's writing or a high frequency list.**

Spelling List: 6 words Name: Marcos

	M 1/24	T 1/25	W 1/26	TH 1/27	F 1/28	M 1/31	T 2/1	W 2/2	Th 2/3	F 2/4	M 2/7	T 2/8	W 2/9	Th 2/10	F 2/11
~~1. long~~	~~C~~	~~C~~	~~C~~					C							
~~2. where~~	~~C~~	~~C~~	~~C~~					C							
~~3. there~~	~~C~~	~~C~~	~~C~~							REVIEW					
4. these	√	C	C	~~C~~				C							
~~5. those~~	~~C~~	~~C~~	~~C~~				√								
~~6. could~~	√	√	~~C~~	~~C~~	~~C~~										
~~7. would~~				~~C~~	~~√~~	~~C~~	~~C~~	~~C~~							
8. should				√	C	√	C	C							
~~9. sight~~				~~C~~	~~C~~	~~C~~									
10. night				C	C	C									
11. tonight					C	√	C	C							
12. midnight						√	C	√							
13. tight							C	C							
14. tighter							C	C							
15. those								C							
16.															
17.															
18.															
19.															

Cody=s WJ III Scores CA 7-8, Grade 1.6

Long-Term Retrieval	***114***
Short-Term Memory	***102***
Processing Speed	***57***
Auditory Processing	***80***
Visual Processing	***107***
Comprehension-Know	***122***
Knowledge (ACH)	***143***
Broad Reading (Grade)	***103***
Broad Reading (Age)	***78***

Adapted Spelling Criteria

4 points: Correct spelling

3 points: Two letters correct in order

2 points: Initial letter correct

1 point: Any letter correct

0 points: No letters correct

Adapted Scoring Criteria

O: no alphabetic representation

1: initial phoneme with a possible spelling

2: correct initial grapheme

3: more than one correct grapheme

4: all phonemes represented

5: all phonemes represented with a possible English spelling

6: correct spelling

Adapted Spelling Scale

0 points: random letters

1 point: One phonetically related letter

2 points: Correct initial phoneme

3 points: Two correct phonemes (does not have to be correct grapheme)

4 points: Correct number of syllables represented (only used for multisyllabic words)

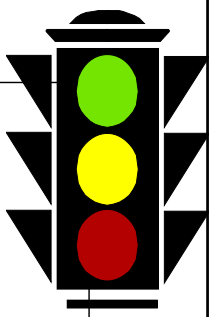
5 points: All phonemes in the word are represented

6 points: All phonemes in the word are represented with possible English spellings (e.g., rane for rain).

7 points: Correct spelling

Adapted from: Tangel and Blachman (1992) and Kroese, Hynd, Knight, and Hiemenz (2000)

Color Coding



Green: Phonically regular words: (e.g., cat, swim)

Yellow: Irregular but frequent patterns (e.g., night)

Red: Irregular (e.g., once)

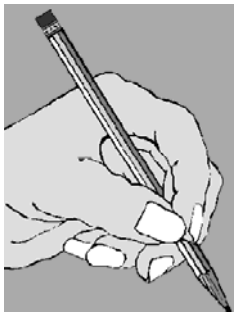
Spelling Grid

- Write the first word in the column, pronounce the word and discuss the meaning.
- Count and write number of syllables in the second column.
- Write each syllable in the next columns.
- Write and pronounce the entire word.

Source: Wong, B.Y.L. (1986). *A cognitive approach to spelling. Exceptional Children, 53,* 169-173.

Effective Spelling Instruction

- Multisensory techniques
- Sequencing sounds correctly
- Writing words from memory
- Practice and review
- High frequency words



High Frequency Word Lists

Focus on the most common words

Use in sight word and spelling instruction

Have students keep lists of words that are mastered for reading and spelling

Provide students with shortened lists for reference

Cognitive and Linguistic Factors that Affect Reading Fluency

Attention

Working memory

Rapid automatic naming (RAN)

Speed of recognizing orthographic patterns

Ease of word retrieval

Depth and breadth of vocabulary

Instructional Factors that Affect Fluency

Time spent reading

Decoding accuracy

Difficulty level of material

Interest level of the text

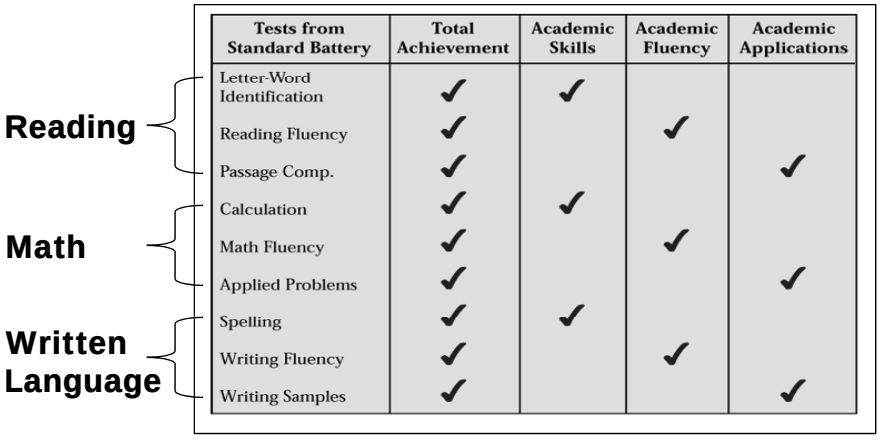
Independent Reading

Differences in Amounts of Independent Reading

Percentile	Minutes of book reading per day	Words read per year
98	65.0	4,358,000
90	21.1	1,823,000
80	14.2	1,146,000
70	9.6	622,000
60	6.5	432,000
50	4.6	282,000
40	3.2	200,000
30	1.3	106,000
20	0.7	21,000
10	0.1	8,000
2	0.0	0

Note. From "Growth in Reading and How Children Spend Their Time Outside of School," by R. C. Anderson, P. T. Wilson, and L. G. Fielding, 1988, *Reading Research Quarterly, 23,* pp. 285-303. Copyright 1988 by Richard C. Anderson and the International Reading Association.

Cross-Academic Clusters



	Tests from Standard Battery	Total Achievement	Academic Skills	Academic Fluency	Academic Applications
Reading	Letter-Word Identification	✓	✓		
	Reading Fluency	✓		✓	
	Passage Comp.	✓			✓
Math	Calculation	✓	✓		
	Math Fluency	✓		✓	
	Applied Problems	✓			✓
Written Language	Spelling	✓	✓		
	Writing Fluency	✓		✓	
	Writing Samples	✓			✓

Cross-Academic Clusters

Academic Skills: measures of basic skills

Academic Fluency: measures of rate and automaticity with controlled difficulty levels

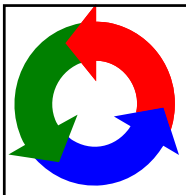
Academic Applications: measures involving reasoning and the application of knowledge

CROSS-ACADEMIC

Cluster	GE	RPI	PR	SS
ACADEMIC SKILLS	2.7	19/90	4	74
ACADEMIC FLUENCY	3.9	75/90	27	91
ACADEMIC APPLICATIONS	5.5	92/90	61	104

WJ III Academic Fluency Cluster was the single most important variable in differentiating between college students with and without learning disabilities

CHC CFA of WJ III, WAIS-III, WMS-III and KAIT-University Students with and without LD (McGrew, Gregg, Hoy, Stennett, Davis, Knight, Coleman & Ford, 2001)



Cross Academic Clusters

Considerations for IEPs

and 504 Plans

Skills < Fluency and Application
Do not penalize for poor skills

Fluency / rate < Skills and Application
Extend Time
Shorten Assignments

Applications < Skills and Fluency
Modify instructional level

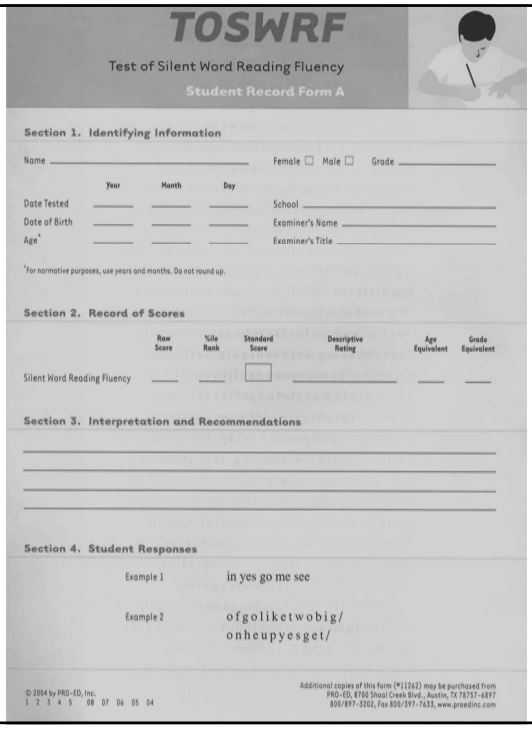
Test of Silent Word Reading Fluency

(TOSWRF) PRO-ED

itdogredsunfell

chaosempathysurrendercostume

it/dog/red/sun/fell/



TOSWRF

Test of Silent Word Reading Fluency

Student Record Form A

Section 1. Identifying Information

Name _____ Female ☐ Male ☐ Grade _____

	Year	Month	Day	
Date Tested				School _____
Date of Birth				Examiner's Name _____
Age*				Examiner's Title _____

*For normative purposes, use years and months. Do not round up.

Section 2. Record of Scores

	Raw Score	%ile Rank	Standard Score	Descriptive Rating	Age Equivalent	Grade Equivalent
Silent Word Reading Fluency						

Section 3. Interpretation and Recommendations

Section 4. Student Responses

Example 1 in yes go me see

Example 2 ofgoliketwobig/
onheupyesget/

Additional copies of this form (#11262) may be purchased from PRO-ED, 8700 Shoal Creek Blvd., Austin, TX 78757-6897
800/897-3202, Fax 800/397-7633, www.proedinc.com

onatgetruncarisfunbluebiglikeback/
eachmuchthreezooapplefarflywould/
wayunderbirdfoundegglunchyardlive/
staygirlcakeofbutpetroomlightvery/
pulldayiceoldeightlargewolfkeyfix/
straightwildgrewaboveswimtrouble/
setdrivequickkickrollbottlejollysky/
fewdesertfaultgazepressrootcrept/
leakjudgehoundtightbuiltcoachfresh/
breezebulbawfulmountelvesbirthwake/
swungmoundrentguestgullbulgenurse/
saucequiltnavymurmurzerogravykettle/
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symbolboltclenchbluffhullgermthrive/
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emberbulkquarrycounseljurypeltfilm/
strictdepthmuzzlefudgeficklefilter/
lureutterbluntvaryreekgaugeutilize/
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molarlynchracialaccessgildjauntsurly/
ebbdivulgegaietystaunchcliqueevolve/
envoydirgedelvebaublenaiveductvigil/
girthfoiblefeignauravoguetautdefer/
fetterlewdlenientcysthulkdetervie/
wreakcommunaldurressprecepteliXir/
sullyseculargirddubcoerceguile/
epochprecludepulsarvernacularquaff/
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Great Leaps Reading (Mercer & Campbell) www.greatleaps.com

Divided into three major areas:
Phonics: sounds in isolation to cvc, cvvc, cvce patterns

Sight Phrases

Stories
K-2 has a Sound Awareness section

Daily timing (one-minute) and charting

Rapid Word Recognition Chart

Chart composed of five rows of 6 irregular words

Time how quickly the student reads the chart.

Count and record number of words read successfully

Source: Carreker, S. (2005). *Teaching reading: Accurate decoding and fluency. In J. R. Birsh (Ed.). Multisensory teaching of basic language skills.* Paul Brookes.

Rapid Word Recognition Chart

pretty	said	who	there	they	what
said	pretty	there	who	what	they
there	who	they	said	pretty	what
who	what	said	they	there	pretty
they	there	pretty	what	who	said

Common Points of Fluency Methods

- **Read while listening to the same material**
- **Track print with finger or marker**
- **Use high-interest material**
- **Use material at the instructional level**

Repeated Readings

- Designed for children who read slowly despite adequate word recognition (Samuels, 1979).
- Select a passage from 50 to 100 words long from a book that is slightly above the student's reading level.
- Have student read the same passage several times.
- Time the reading and count the number of errors.
- Record the reading time and the number of words pronounced incorrectly.
- Use two different color pencils for recording time and errors, or make the number of seconds, a circle, and "X" or square for the errors.

Rate-building Exercises

- Repeated reading of 100-200 words
- Count out 100 word passage
- Have student practice passage until he or she can read it in the targeted time with 2 or fewer errors
- Set target reading rate 40% higher than current rate
  - 50 wpm, target would be 70 wpm
  - (50 + [40% of 50 =20] = 70 wpm (p. 193)

Direct Instruction Reading, 4th edition

Rate-Building

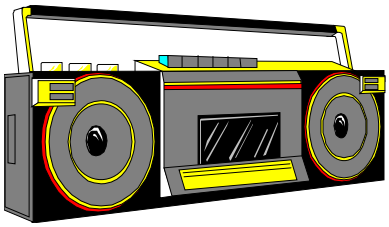
- Every two weeks, have the student read a passage at their independent level of similar difficulty to passages in rate-building exercises
- If rate has improved, the teacher sets a new target rate on the new rate plus 40%
- Conducted in a small group setting in two 15 to 20 minute sessions daily

Repeated Readings

- Teacher feedback on errors
- Instructional level text
- Daily practice
- Charting of performance
- Set a criterion goal

Taped Books

- Have child follow along with the print
- Ensure that the pace is appropriate
- Ensure child can follow procedure for finding the place (e.g., chime, page number)
- Encourage repeated listenings



How Fast is Fluent Reading?

- End of first grade: 60 wpm
- End of second grade 85-100 wpm
- End of third grade 100-120 wpm
- End of fourth grade 105-130 wpm
- End of fifth grade 130-140 wpm

Tips for Teaching Fluency

- Ensure active engagement
- Have students engage in multiple readings (three or four times)
- Use instructional level text or decodable text with struggling readers
- Read passages aloud to an adult

Adapted from:

Meyer, M. S., & Felton, R. H. (1999). Repeated reading to enhance fluency: Old approaches and new directions. *Annals of Dyslexia,* XLIX, 283-306.

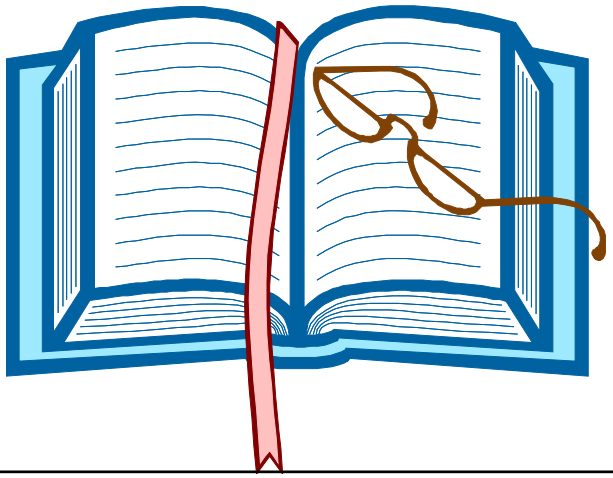
- Provide extra practice with trained tutors
- Provide corrective feedback on word errors
- Establish a performance goal or criterion of the number of words per minute
- Provide short, frequent periods of fluency practice
- Provide concrete measures of progress using charts and graphs

Websites for Reading Fluency

- Concept Phonics (Speed Drills) http://www.oxtonhouse.com/concept_phonics.html
- Great Leaps
  www.greatleaps.com
- Kurzweil 3000
  www.kurzweiledu.com
- OKAPI! (used to create Curriculum-based Measurement probes)
- http://www.interventioncentral.org/htmdocs/tools/okapi/okapi.php
- One-Minute Reader
  www.oneminutereader.com

- Online Leveled Reading Library K-6
  http://www.raz-kids.com/
- QuickReads www.QuickReads.org
- RAVE-O http://ase.tufts.edu/crlr/raveo.html
- Read Naturally www.readnaturally.com
- Reader's Theatre Scripts
  www.teachingheart.net/readerstheater.htm
- Recordings for the Blind & the Dyslexic
  www.rfbd.org
- Six-Minute Solution
  http://store.cambiumlearning.com
- Soliloquy Reading Assistant
  http://www.soliloquylearning.com

Different People require Different Approaches at Different Developmental Stages



Instructional Activities: Developmental Levels

Prealphabetic: Phonological awareness, Elkonin boxes, onset-rimes, letter/sound activities

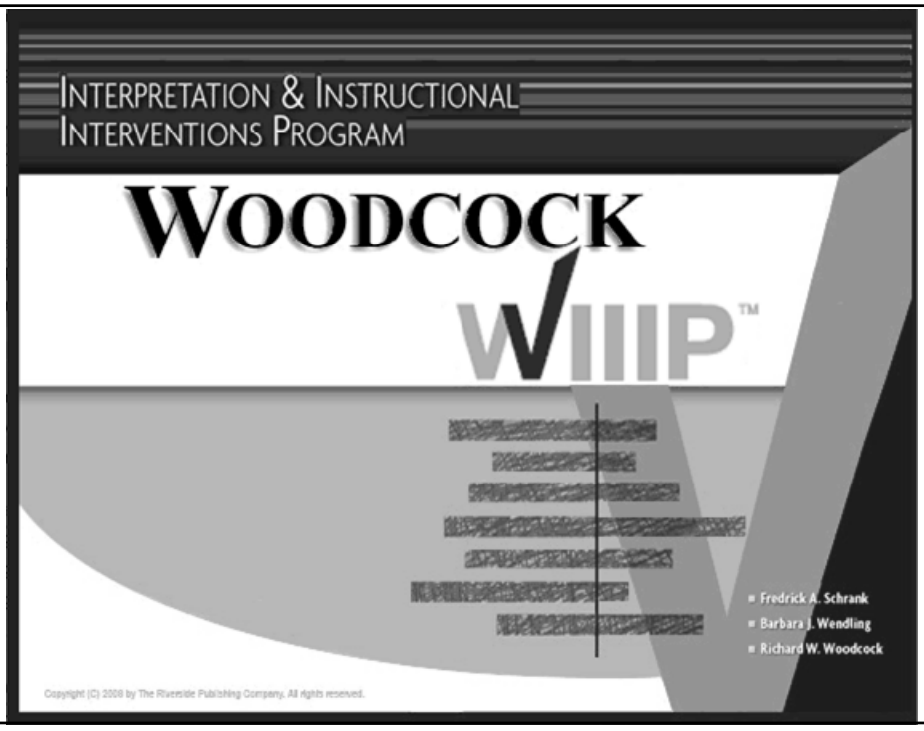
Partial alphabetic: Phonics, multisensory teaching, making words

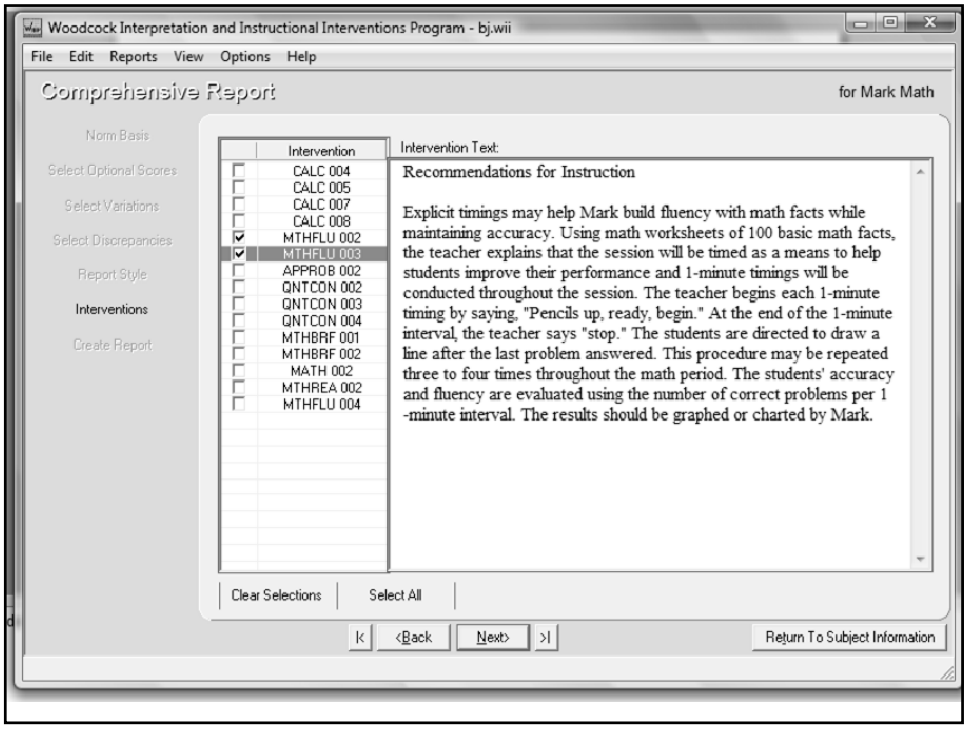
Full alphabetic: Structural analysis, chunking by syllables

Consolidated alphabetic: fluency and rate

"It would seem that, taken as a group, these studies suggest that instruction in small groups with high response rates, immediate feedback, and sequential mastery of topics-all typical of good teaching-are more important than the specific evidence-based program used."

From: Responsiveness to Intervention and Learning Disabilities, A report prepared by the National Joint Committee on Learning Disabilities, June 2005, p. 11





Reason for Referral

- Extreme difficulties in learning basic writing and reading skills
- Mario is very much a beginning reader; his reading behaviors are similar to someone who is just learning to read and amazingly low for someone with his level of intelligence.

Background Information

- Mario is a 15 years-old, Hispanic male who is currently attending Tucson Art Academy School.
- The mother's pregnancy was reported to be normal, and Mario's early developmental milestones were all within typical developmental ranges.

Previous Testing

- Universal Nonverbal Intelligence Test (UNIT), Mario was functioning in the Average range of intellectual functioning.
- CBM indicated that Mario was behind in reading and written language skills. Conversely, the CBM results suggested that his math skills were similar to other children of his grade.

Previous Recommendations

Further testing in Spanish

A behavioral intervention plan

There was no need for assistive technology.

Tests Administered

- WJ III ACH Standard (Tests 1-12) and Extended (Tests: Word Attack, Spelling of Words, Picture Vocabulary, and Oral Comprehension.
- WJ III COG Standard (Tests 1-7) and Extended (11-17).
- CBM for reading; (CWPM).
- CBM for spelling; (CLS).
- Test of Irregular Word Reading Efficiency (TIWRE).
- Rapid Automatized Naming and Rapid Alternating Stimulus Tests (RAN/RAS).

CBM for Reading

- CBM for Reading was administered at the 1st grade level.
- The scores were reported as correct words per minute (CWPM).
- Probe 1 - 25 Probe 2- 24 Probe 3- 26
- the median would be 25 CWPM at the first-grade level.

Summary and Conclusions

- Mario is presently a 15 years-old. He was referred for an evaluation by his teacher because of his severe difficulties with reading and writing.
- Mario has average general intellectual ability.
- Mario demonstrated a significant strength in fluid reasoning.

Summary and Conclusions

- His comprehension-knowledge and long-term retrieval were limited to average
- Mario's proficiency in short-term memory was limited, as was his speed in performing cognitive tasks
- Mario also demonstrated low scores on measures of rapid automatized naming (RAN)
- Mario's oral language skills were average to advanced

Summary and Conclusions

- Mario's overall level of achievement was very limited
- Mario's proficiency was average in broad mathematics
- His broad written language is very limited
- His proficiency is negligible in broad reading
- His knowledge of phoneme-grapheme relationships is very limited.

Educational Recommendations

- Provide Mario with an intensive phonics program that will teach him phoneme-grapheme relationships directly.
- Provide Mario with taped versions of his classroom textbooks
- When Mario can read words accurately, focus on strategies to build reading fluency.

"About one-third of the children in the longitudinal study were receiving special help, but this help was often very erratic, occurring sporadically and consisting of what might best be described as a Band-aid approach to a gushing wound" (pp. 34-35).

Source:

Shaywitz, S. (2003). *Overcoming dyslexia: A new and complete science-based program for reading problems at any level.* New York: Alfred A. Knopf.

How?

- **Are negotiated**
- **Are temporary and revised**
- **Are reasonable and possible within the environment**
- **Do not alter fundamental requirements**
- **Viewed as empowering (supported by student and teacher)**

Examples of Reasonable Accommodations

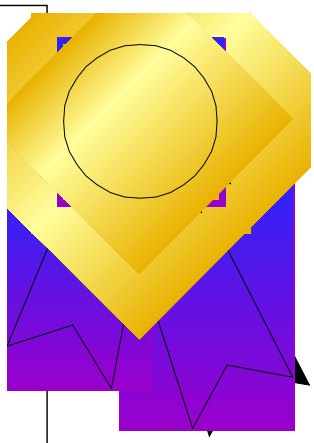
Extended time

Untimed exams

Oral exams

Required readings on tape

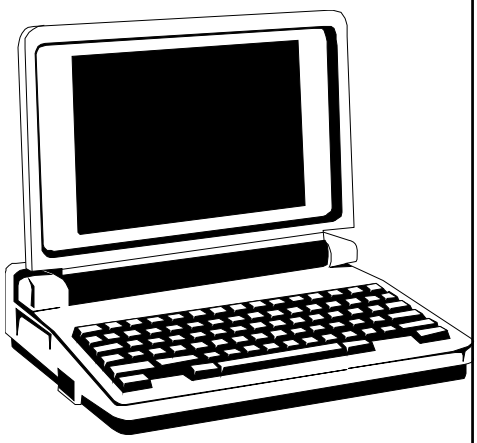
Copy of class notes



Use of Technology

Can increase:

- Motivation
- Efficiency
- Accuracy
- Independence



"A President, a secretary of education, or a legislative body may well declare that 'no child will be left behind,' but that does not change the fact that testing (or any other measurement required for accountability) will always produce a distribution, including a bottom – even a bottom quartile, even a bottom tenth, even an individual or a group that scores lowest. It happens every single time, no exceptions!" (p. 521)

Kauffman, J. M. (2005). Waving to Ray Charles: Missing the meaning of disabilities, *Phi Delta Kappan, 86,* 520-521, 524.

Design of Study in which intervention occurred

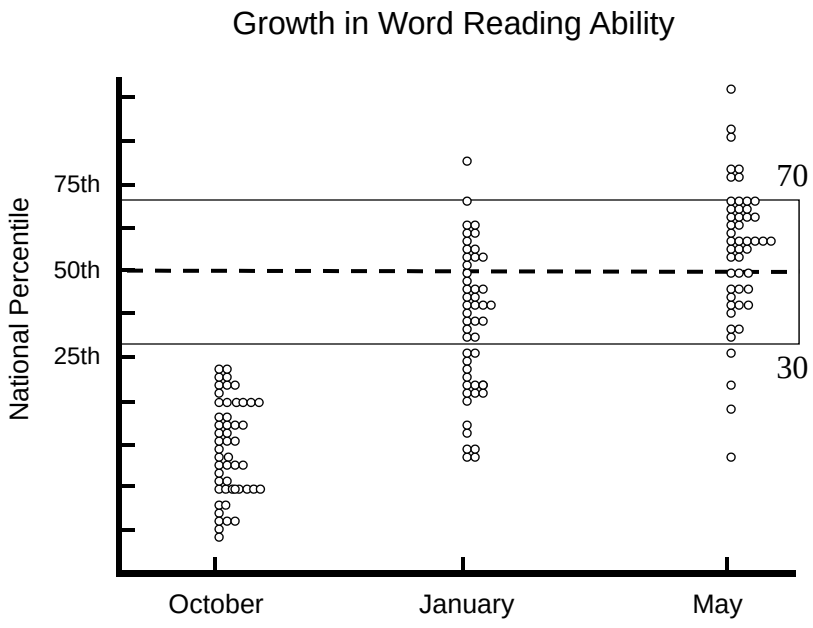
1. Most “at risk” first graders from five elementary school - PPVT above 70

2.Instruction provided in 45 min. sessions every day from October through May in groups of 3 or 5 by experienced teachers or well-trained paraprofessionals

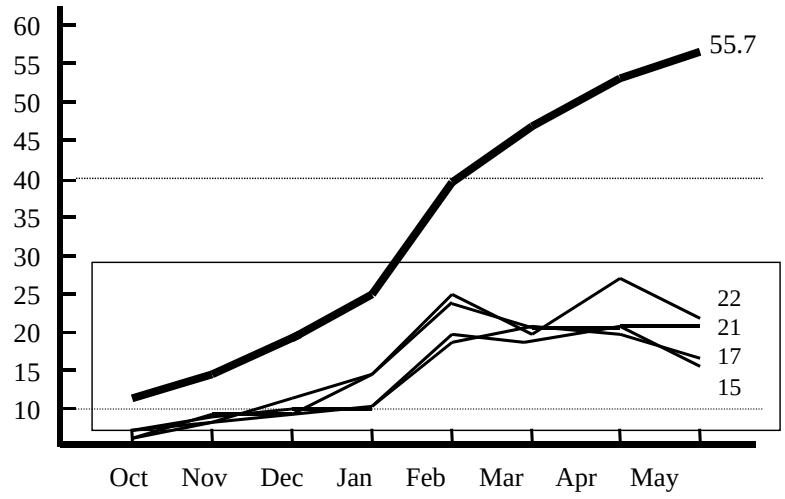
3. Used a structured (scripted) reading program that contained instruction and practice in phonemic awareness, phonics, fluency, and comprehension

4. Used a number of methods to achieve fidelity of implementation: 3 days of initial training, weekly supervisory visits, and monthly inservices (3 hours)

Source: Torgesen, J. K. (2004, January). *Setting new goals for reading interventions: Evidence from research. Keynote presentation at the Northern California Branch of the International Dyslexia Association, San Francisco.*



Growth in Correct Words Per Minute on First Grade Level Passages for four lowest performers



"The remedial work was unsuccessful in about 4 or 5 percent of the cases, in that this percentage of cases did not show improved scores on the pretest" (p. 151).

Monroe, M., & Backus, B. (1937). *Remedial reading.* Boston: Houghton Mifflin.

IRREDUCIBLE FACTS FOR TEACHING

1. Differences in learning rate exist.

   Instructional procedures that treat students as equal are bound to be ineffective for either the upper or lower ranges or both.

2. Span of student ability

   Average third-grade class will have a six-grade spread of ability.

Source: Ladas, H.S. (1960). A handbook of irreducible facts for teaching and learning. *Phi Delta Kappan*, 606-607.

Knowing what is needed
to help students
is not
the same thing as
being able to provide it.

Kauffman, J. M., Lloyd, J. W., Baker, J., & Riedel, T. M. (1995). Inclusion of all students with emotional or behavioral disorders? Let's think again. *Phi Delta Kappan*, 542-546.

Conclusions Regarding Instruction for Students with Reading Disabilities

- **Effective instruction plays a critical role in development**
- **Early, intensive interventions are important**
- **Instruction must be adjusted based upon a student's needs**

- Training in processes without academic content is ineffective
- The most effective methods are explicit and intensive
- No single approach works with all students
- Even "evidence-based" methods fail to work with certain students.

Adapted from:

Fletcher, J. M., Lyon, G. R., Fuchs, L. S., & Barnes, M. A. (2007). *Learning disabilities: From identification to intervention.* New York: Guilford Press.

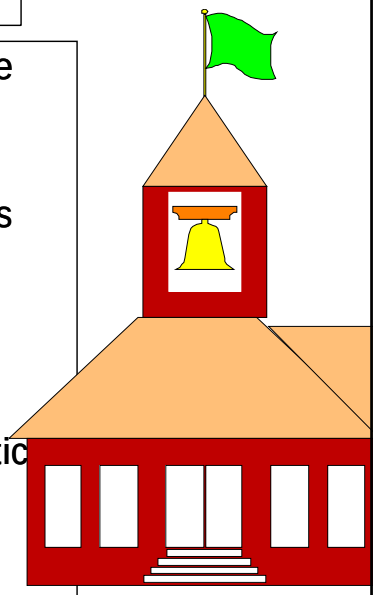
"Slow reading acquisition has cognitive, behavioral, and motivational consequences that slow the development of other cognitive skills and inhibit performance on many academic tasks. In short, as reading develops, other cognitive processes linked to it track the level of reading skill. Knowledge bases that are in reciprocal relationships with reading are also inhibited from further development.

The longer this developmental sequence is allowed to continue, the more generalized the deficits will become, seeping into more and more areas of cognition and behavior. Or to put it more simply and sadly—in the words of a tearful 9-year-old, already failing frustratingly behind his peers in reading progress, 'Reading affects everything you do.' " (p. 390)

Stanovich, K. E. (1986). Matthew effects in reading: Some consequences of individual differences in the acquisition of literacy.*Reading Research Quarterly, 21,* 360-407.

Successful Instruction

1. Provide instruction slightly above the present performance level.
2. Adapt and modify instruction, as needed.
3. Be eclectic in methodologies.
4. When needed, provide systematic intensive instruction in the most effective setting.



"One of the most important conclusions from research is that for children with learning problems, learning is hard work. A corollary to this finding is that for their teachers, instruction is very hard work and requires an enormous amount of training and support. Children who have difficulty learning to read or completing mathematics problems will likely not benefit from 'more of the same' but require an alternative method of teaching to assist their learning."

Source: Semrud-Clikeman, M. (2005). Neuropsychological aspects for evaluating learning disabilities. *Journal of Learning Disabilities, 38,* 563-568.