



Demystifying Dyslexia: The History, Research, and Best Practices for Supporting All Students

Rachel Brown, Ph.D., NCSP

John Bielinski, Ph.D.

9/14/2022



Demystifying Dyslexia: The History, Research, and Best Practices for Supporting All Students

Wednesday, Sept 14, 2022



Rachel Brown, Ph.D., NCSP

*Senior Research Consultant
Illuminate Education, Inc.*



John Bielinski, Ph.D.

*Senior Director of Research and Development
Renaissance Learning*

Join the **Innovation in Education** community: www.edweb.net/leadingchange



Here are some edWebinar tips...

- **Ask a question** by clicking the question mark icon on your screen.
- **To disable pop-up alerts from the chat**, click the checkbox at the top of the chat. For mobile devices turn off notifications in the AnyMeeting mobile app settings.
- **Close other applications** that use bandwidth or resources on your device.
- **For audio issues** you can also use your phone by clicking the phone icon at the top of your screen.
- **If you're having trouble connecting**, try refreshing your browser or relaunching the app.
- **Captioning will be added** to the recording within two weeks of the live event.



Get your CE Certificate for this presentation



Join edWeb to get your CE certificate – it’s free!

Your CE certificate can be downloaded from your edWebinar transcript on your homepage by the end of the next business day.

The CE quiz will also be posted on your edWebinar transcript in case you need to take the quiz.

Join the community for free access to the resources!

Community members can get all the resources for this edWeb presentation and access to recordings and resources for past presentations:

edweb.net/leadingchange



Jan Dierkes
M.Ed.

Dr. Rachel Brown began her career as a middle school social studies teacher. She quickly learned that many of her students could not read well enough to understand assigned texts. This led Dr. Brown to earn certification as a special educator. Having learned that special education was not the answer to all students' learning challenges, she earned her Ph.D. in school psychology and special education at the University of Massachusetts Amherst in 2000. Her research focuses on effective reading instruction and assessment within a Multi-Tiered System of Support. She is currently Senior Research Consultant with Renaissance Learning.

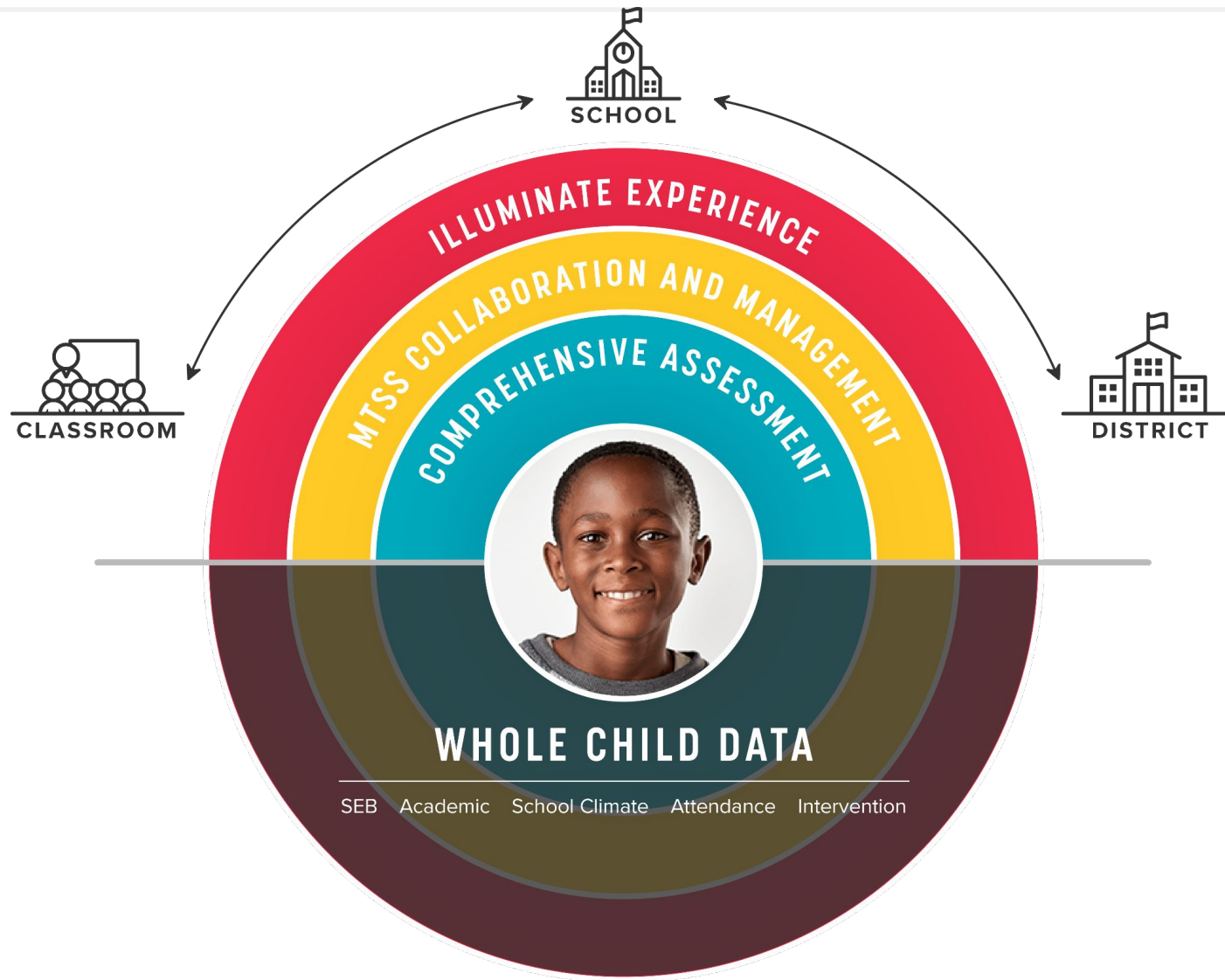


Jeremy O'Neil

Dr. John Bielinski is a psychometrician by training and has led development of educational tests and educational research in the industry for 20 years. Dr. Bielinski began his career in education policy at the National Center on Educational Outcomes and joined Illuminate (now part of Renaissance Learning) in 2018. His expertise is in CBM and modeling growth.



The Illuminate Solution || Renaissance Learning



Overview



History



Myths



Screening



Supports



History of Dyslexia



Early Researchers

- Rudolf Berlin (1887)
 - Introduced the term dyslexia
- W. Pringle Morgan (1896)
 - Eye surgeon
 - Published first article in Britain
- James Hinshelwood (1907)
 - British physician
 - First to suggest that the cause was a specific brain region



Dyslexia Features



- Difficulties with:
 - Phonological processing
 - Sound-symbol correspondence
 - Reading fluency
 - Spelling
 - Comprehension



Samuel T. Orton

- Iowa pediatrician
- Some patients struggled to learn to read
 - Otherwise typical development
 - Attended school regularly
- Began research and instruction
 - Hypothesized cause was lack of cerebral dominance
 - Systematic instruction
 - Orton-Gillingham Method
 - Multisensory
 - Explicit



Possible Causes

- Early focus on visual problems
 - Letter reversals
 - Slow reading
- Most recent research
 - Norman Geschwind (1960s) at Harvard confirmed neurophysiology
 - Phonological deficits result from complex neural connections
 - Double deficit hypothesis (Bowers & Wolf, 1993)
 - Poor rapid automatized naming (RAN)
 - Poor letter-sound mapping



Treatment Options before 1975

- Specialized schools
 - Available in major cities
 - Parents had to pay tuition
- Public schools
 - Not required to provide specialized instruction
 - Students could be turned away



Education of Handicapped Children Act (PL 94-142)



- 1975
- Federal law passed by U.S. Congress
- Created Special Education
- Required states to implement
 - Or not receive federal school funding
- Dyslexia covered
 - Specific Learning Disability



Remaining Confusion

- Dyslexia misunderstood as different from SLD
- Some teachers and parents thought
 - Medical diagnosis
 - Schools cannot:
 - Use word dyslexia
 - Treat dyslexia
 - Dyslexia not covered under IDEA



OSEP Dear Colleague Letter (October, 2015)

- Letter to all schools in the U.S.
- Confirmed that dyslexia is covered in Special Education (IDEA, 2004)

*The Office of Special Education and Rehabilitation Services (OSERS) has received communications from stakeholders, including parents, advocacy groups, and national disability organizations, who believe that State and local educational agencies (SEAs and LEAs) are reluctant to reference or use dyslexia, dyscalculia, and dysgraphia in evaluations, eligibility determinations, or in developing the individualized education program (IEP) under the IDEA. The purpose of this letter is to clarify that there is **nothing in the IDEA that would prohibit the use of the terms dyslexia, dyscalculia, and dysgraphia in IDEA evaluation, eligibility determinations, or IEP documents.***



State Policies

SEAs Has Dyslexia Legislation ?

Screening Required ?

Pre-service Required ?

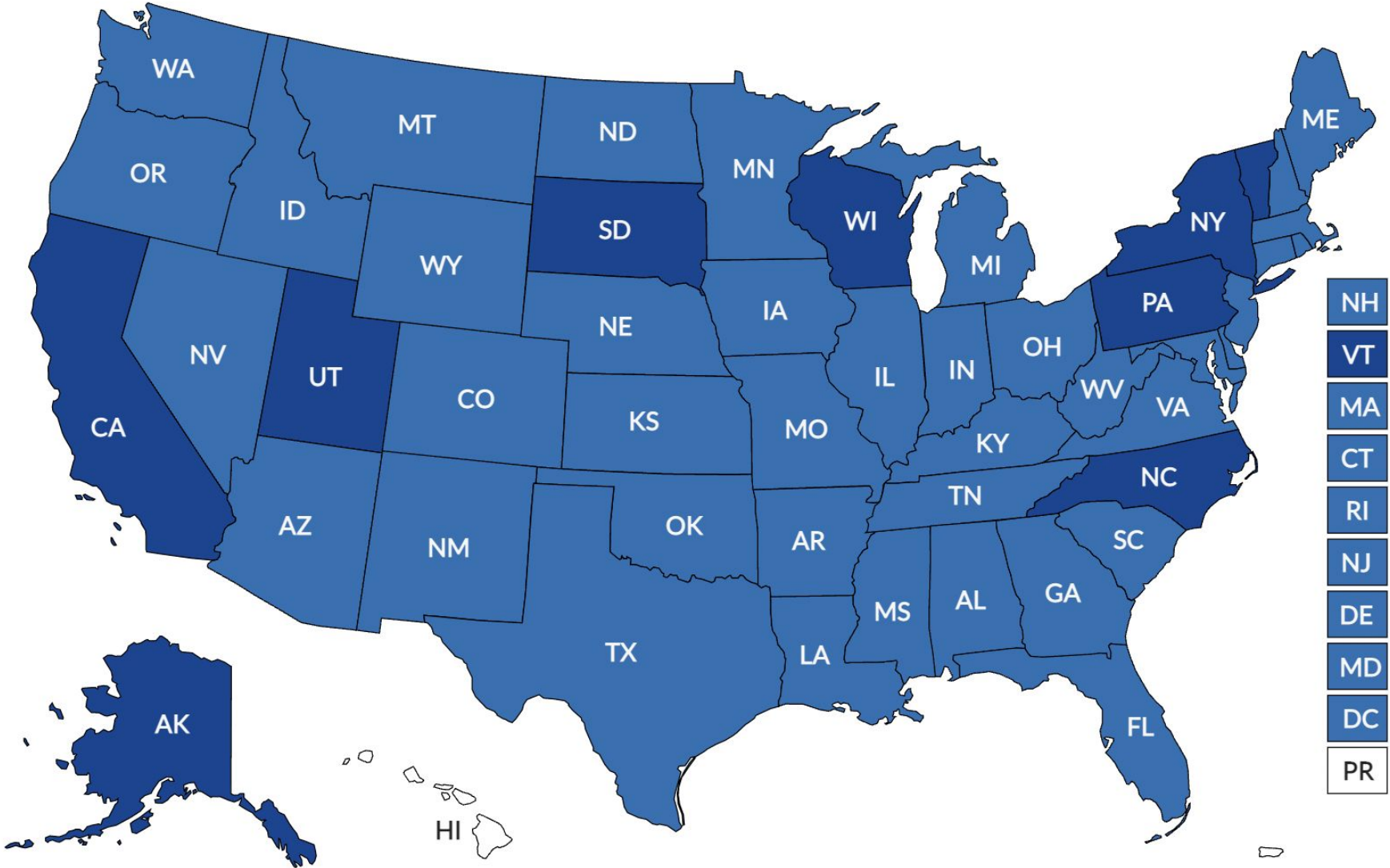
In-service Required ?

Intervention Required ?

All Policies Required ?

✕ Clear

SEAs Has Literacy SIMR ?



Current Definition (2002)

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



Myths



Myth 1:

People with
dyslexia cannot
learn to read

Reality: Those
with dyslexia can
learn to read*

(*with proper instruction)



Myth 2:

Dyslexia is a visual impairment

Reality: dyslexia is caused by deficits in RAN and phonological processing



Myth 3:

Schools cannot
diagnose or
treat dyslexia

Reality: Schools must
evaluate* students
with suspected
dyslexia

(*and provide intervention if eligible)



Myth 4:

All students with
dyslexia require
special education

Reality: Only
some students
with dyslexia need
special education



Myth 5:

Colored overlays
help people with
dyslexia read

Reality: Overlays
don't help
because it's not
a visual problem



Myth 6:

Special fonts
help people with
dyslexia read

Reality: Special
fonts don't help
because it's not
a visual problem



Myth 7:

Every person
with dyslexia has
the same
experience

Reality: Dyslexia
exists on a
continuum from
mild to severe



Myth 8:

Dyslexia only affects
learning to read
English

Reality: Dyslexia
occurs in all
alphabetic
languages and likely
in others



Myth 9:

People with dyslexia
are always better at
math

Reality: Some
people with dyslexia
are better at math,
but not everyone



Myth 10:

Dyslexia
happens only
during childhood

Reality: Dyslexia
is a lifelong
condition



Screening



Components of Screening in MTSS

- Annual or seasonal
- Brief assessment (typically standardized testing protocols)
- Key indicators (skills most predictive of future outcomes)
- Classification decisions (at-risk, not at-risk)
- Intervene and monitor



Screening with High Frequency Words

- Brief
- Objective
- Valid indicator of risk

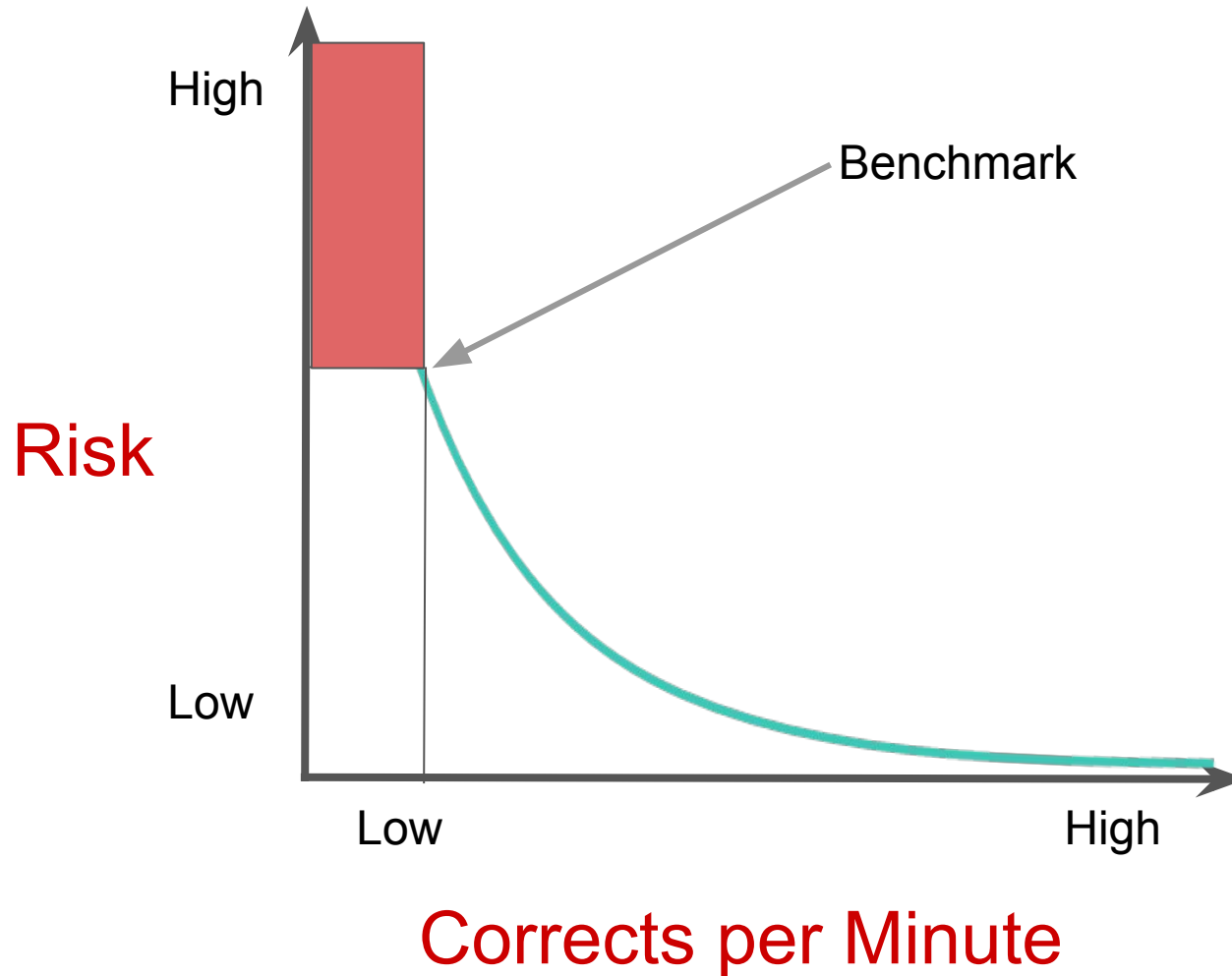
High Freq. Words

| | | | | |
|-------|-------|------|-------|-------|
| have | out | for | me | it |
| help | them | when | most | its |
| made | play | much | who | today |
| what | some | if | are | day |
| how | first | work | good | that |
| find | four | well | never | took |
| but | just | my | be | at |
| time | there | it's | house | down |
| light | best | many | could | got |
| was | by | she | so | can |

- 60 sec
- Standardized instructions & scoring rules
- Strong correlation with reading fluency



Indicator of Risk



Benchmark

- Divides score distribution into groups
- Defined via classification studies
- Often greater than 80% accuracy
- Classification errors greatest near benchmark



Screening with High Frequency Words

Grade 1 Screening

Fall Benchmarks

- **High Risk:** < 5 wpm
- **Some Risk:** 5 - 15 wpm
- **Low Risk:** 16+ wpm

Classification

- **Criterion:** ORF
- **Concurrent:** 0.84
- **Predictive:** 0.79
- **Accuracy:** 83%
- **Sensitivity:** 80%



What Is Being Indicated?

- An unexpected difficulty reading for an individual who has the intelligence (i.e., cognitive ability) to be a much better reader, conditioned on ability and age/grade. Characterized by difficulties with accurate and/or fluent word recognition and by poor spelling and decoding abilities. These difficulties typically result from a deficit in the phonological component of language.
- MTSS adds - *reading difficulty persists after high quality research-based interventions*

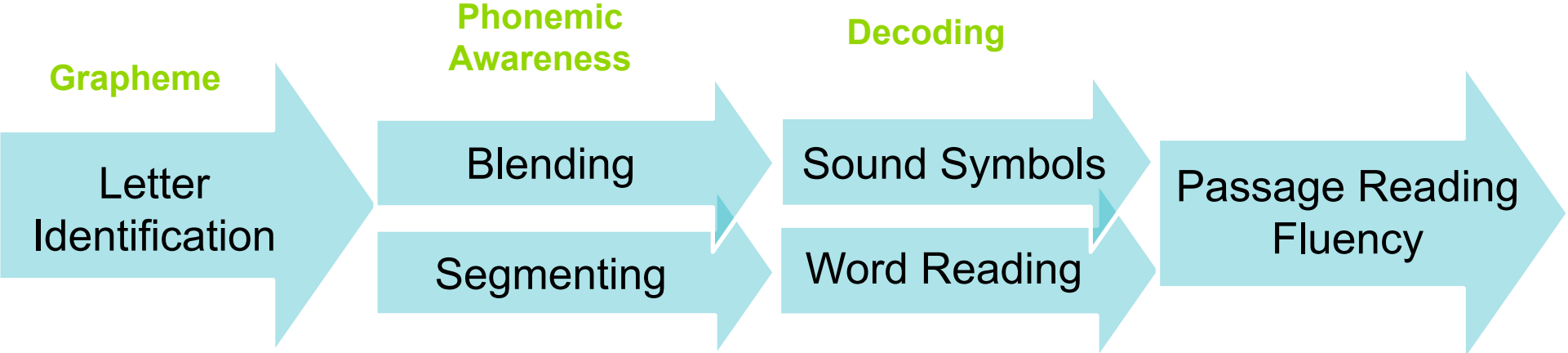


Indicators of Dyslexia

- **Phonemic Awareness** (blending, segmenting)
- **Phonics** (letter-sound correspondence)
- **Rapid Automated Naming** (letters, digits, objects, colors)
- **Word Reading Fluency** (decodable, sight, and pseudo)
- **Spelling** (encoding)



Early Reading Skill Progression (typical)



Automaticity

Mid-K

End of K

Mid-1

End of 1-3



Dyslexia Screening Research

Arauyo et al. (2015)

- Meta-Analysis of RAN predicting word reading & comprehension
- 137 studies, 857 effect sizes
- RAN with word reading, $r = 0.45$
- RAN with comprehension, $r = 0.39$
- RAN with word reading
 - Strongest is letter names, $r = 0.51$
 - Weakest is colors, $r = 0.33$
 - Slightly stronger prediction ($r = 0.57$) with opaque orthographies (e.g., English)
 - Moderately transparent, such as Spanish, $R = 0.48$

Fuchs et al. (2011)

- Predictive validity of screeners with word reading
- 318 first graders, low performing
- Letter Naming, $r = 0.59$
- RAN Letters, $r = -0.62$
- Initial Sounds, $r = 0.65$
- Prediction of Comprehension
 - Word reading: 0.72
 - Letter Naming & RAN: 0.53, -0.54
 - Initial Sounds: 0.61



Dyslexia Screening Research (cont.)

Schatschneider et al. (2004)

- Predict rapid word reading (& comp) in end of grades 1 & 2 from KG screening
- 384 K → 1, 189 K → 2
- Rapid Word Reading prediction at end of grade 1
 - LN, LS, & PA: 0.50 - 0.54
 - RAN Letters: 0.65
- Rapid Word Reading prediction at end of grade 2
 - 0.33 for PA, 0.49 for LN, and 0.55 for RAN letters
- Prediction of comprehension
 - Stable across measures and intervals with Rs in low to mid 0.40s

Burns et. al. (2022)

- Compared skills based screener (DIBELS) with a teacher rating form (Shaywitz) to predict low PA
- 115 K - 3 at risk students
- Sensitivity
 - Shaywitz: 0.35
 - DIBELS: 0.90
- Overall classification
 - Shaywitz: 0.45
 - DIBELS: 0.78



Conclusions

- Dyslexia screeners predict future reading problems (esp. deficits in decoding, fluency, and comprehension)
- Combination of PA (e.g., initial sound identification) and rapid naming (e.g., letters) provides:
 - Moderate prediction of word reading fluency; somewhat more modest for comprehension
 - Prediction slightly decreases across time
- Word reading strongly predicts oral reading fluency which strongly predicts comprehension
- Empirical data supports a developmental sequence:
 - letters → phonemic awareness → decoding → passage reading fluency
- This developmental sequence can be leveraged to improve prediction
 - e.g., including a word reading measure and oral reading fluency when developmentally appropriate



Supporting Students with Dyslexia



Effective Dyslexia Intervention



- **Structured literacy instruction**
 - Direct
 - Explicit
 - Systematic
 - Focus on phonological coding
 - Multisensory?
- **Within an MTSS is best**
 - Structured literacy in the core (all)
 - Supplemental instruction (some)
 - Intensive intervention (few)



Dyslexia “Programs”

- Orton-Gillingham
 - Wilson
 - Slingerland
 - Sonday
 - SPIRE
 - Many others...
-
- These only work if implemented correctly!
 - Teacher training
 - Integrity
 - Time



Progress Monitoring

- **Necessary for all students participating in dyslexia intervention**
- **Shows if the efforts are working**
- **Progress measure needs to match focus of intervention**
 - Phonemic awareness:
 - Word Segmenting
 - Phonics:
 - Letter Sounds
 - Nonsense Words
 - Automaticity:
 - Word reading
 - Passage reading



Special Education



- **To be provided if:**
 - Comprehensive evaluation shows evidence of dyslexia – AND --
 - Team decides special education is needed
 - Parents agree to services
- **Not all students with dyslexia will require an IEP**
 - Mild cases might be addressed through
 - Tiered supports
 - 504 plan



504 Plan

- Different federal law
- Provides
 - Recognition of disability
 - Accommodations
 - **NO special instruction**
- Examples for dyslexia
 - Books on tape
 - Additional time for assignments and tests



Questions?

SOCIAL MEDIA
INTERNET
EMAIL



The Illuminate Solution



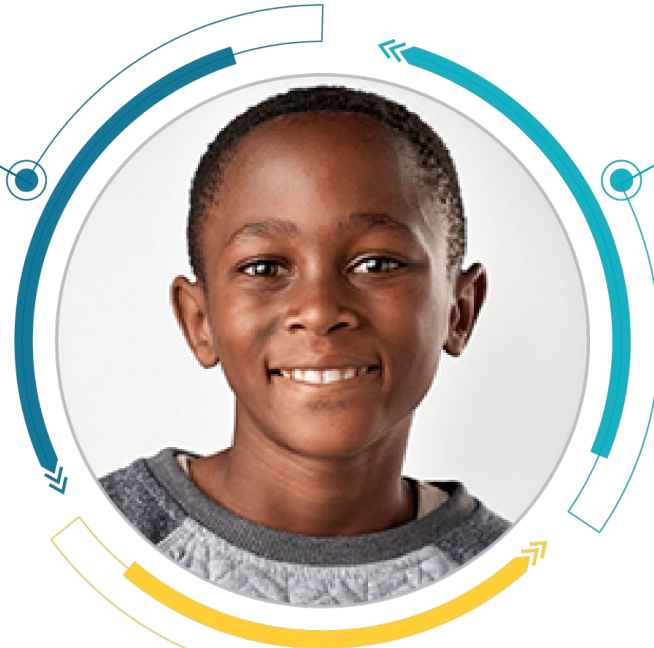
Screening and Progress Monitoring

Research-based universal screening and progress monitoring for academics and social-emotional behavior (SEB) with intervention recommendations



Assessment Creation and Administration

Highest-quality, standards-based assessments with instant scoring, formative feedback, interactive reporting, and targeted activities



MTSS Collaboration and Management

Interactive district-level to whole-child data management that strengthens MTSS implementations, including student need identification and intervention effectiveness



Thank you!

SOCIAL MEDIA
INTERNET
EMAIL

- PLAN
1. w
 2. m
 3. n
 4. w

