Evidence-based, Research-based, Consensus-based or Anecdotal Support for a Dyslexia Treatment Method: What’s the Difference and Why Should You Care?

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Neuro-development of Words - NOW!®
(world wide, online services)

The Einstein School
(a free, public charter school for children with dyslexia)

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Dept. of Speech, Language and Hearing Sciences

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Ocala and Gainesville, FL

November 10, 2017 8:30 AM; International Dyslexia Association; Reading, Literacy & Learning Conference
OVERVIEW

I. Some things to think about....

II. “Critical Consumer” Elements for Advancing:
   1. Prevention of Phonological Awareness Deficits,
   2. Early Intervention for Dyslexia &
   3. Remediation of Dyslexia (kids & adults)

III. ‘Tough Questions’ for Professionals, IDA., Decoding Dyslexia, Schools, Teachers, Parents = US
   “Contrast Aids Perception”
Examples: The story

- I was a "Prevention kid" in 1971
  - mentors Pat Lindamood, Ken Heilman, Joe Torgesen
- PhD Training in Neuropsychology, Univ of FL
- 1989 - 1st brain imaging study of adults with severe dyslexia
- The Morris Center, Gainesville, FL
  - 1991 Annals of Dyslexia paper
  - 1993 grants: three, 5-year studies of
    1. "preventing dyslexia's reading problems in high-risk 5-year olds.
    2. Remediation of dyslexia reading accuracy problems in 8-10 year olds
    3. Improving reading accuracy & fluency in children with dyslexia
Improving READING in Dyslexia IS....
“Learning and behavior are the visible aspects of sensory integration.” (Ayres, 2005, p. 27)

“Reading, writing, and arithmetic...are extremely complex processes that can develop only upon a strong foundation of sensory integration.” (Ayres, 2005, p. 11)
Promoting Academic Success: All are needed by ALL students

Attention (precedes thinking/learning)
Sensory, Motor skills & Modulation
Learning & Memory skills
Spoken & Written Language skills
Psychological health
  – self-esteem, interpersonal skills, regulation of mood or anxiety
Behaviors for learning & achievement –
  - engagement, motivation, compliance
Executive Functions
  – planning, organizing, managing time
COLLABORATIVE NETWORKS:
working together for the MOST progress & student success

CHILD
PARENTS
TEACHERS
OTHER PROFESSIONALS
GOVERNMENT
BUSINESS
COMMUNITY
COUNTRY
“As long as teachers/educational systems identify more with a philosophy of teaching reading than being proponents for evidence-based BEST outcomes, the students will continue to fall behind in reading, because the science to support the students’ needs is not being kept at a priority.”

“…..interactions among members of an affinity group reinforce shared beliefs, solidifying group identification and coherence. Evidence that contradicts fundamental beliefs does not shift the group toward consensus with opposing views but instead strengthens existing views or shifts them to more extreme positions.
”

Private - med schools were private
Chaotic - random training of Docs
Poor quality control - many patients die
Random results - different approaches because they thought each patient's body worked differently & poor quality training.

Scientific Method - careful testing and finding the most effective methods, medications, and treatment program for all Docs to use with ALL patients (as overall, the human body did NOT work differently for each patient)
Programmatic Research Investigations

Small clinical study
Randomized Controlled Study - The Morris Center and Joe Torgesen group at FSU conduct and publish groundbreaking research on preventing and remediating reading problems in dyslexia.

Peer Review of Grant funded Research - does it matter who funds the study?
Neuroscience - Brain’s Building Blocks

How the brain works - SAME sensory inputs for ALL children, who do NOT have neurologic injury/damage (dyslexics have same 8 sensory inputs as typical readers)

Neural Firing and Wiring
- 7 key elements or "FRIENDS" of learning
https://www.linkedin.com/in/timconwayphdthemorriscenter/detail/recent-activity/posts/ (click here for more information)

Neurodevelopmental Pyramid’s of function
“Progress” in Learning Phonics for Students who enter Grade 1 with bottom 20th%ile Phonological Awareness

[NOTE: “Progress” does NOT mean the GAP is being closed – insist on “closing the GAP” for BEST outcomes] (Torgesen & Mathes, 2000)
“Progress” in Learning Sight Words if Students enter Grade 1 with bottom 20th%ile Phonological Awareness

[NOTE: “Progress” does NOT mean the GAP is being closed – insist on “closing the GAP” for BEST outcomes]

(Torgesen & Mathes, 2000)
“Progress” in READING COMPREHENSION if entering Grade 1 in bottom 20th%ile Phonological Awareness

[NOTE: “Progress” does NOT mean the GAP is being closed – insist on “closing the GAP” for BEST outcomes]

GRADE LEVEL CORRESPONDING TO AGE

READING GRADE LEVEL

- Average 50th %ile
- Low 20th %ile

SAME VERBAL ABILITIES – VERY DIFFERENT READING COMPREHENSION
UNIQUE AND OVERLAPPING NETWORKS
SENTENCE/SYNTACTIC, SEMANTIC, PHONOLOGICAL

(Vigneau, et al., 2006)
Typical LANGUAGE Networks

- **SPEECH PRODUCTION AREA**
- **AUDITORY PROCESSING AREA**
- **VISUAL-LANGUAGE ASSOCIATION AREA**
- **VISUAL / VERBAL AREA**

**LEFT HEMISPHERE**
Microneurodysgenesis and Genetic Dyslexia

Accumulating evidence is highly suggestive of a connection between disruption of embryonic neuronal migration and genetic susceptibility to RD (Gabel, et al, 2010)
Neuronal migration goes awry in developmental dyslexia?
Neuronal Ectopia

(Ramus, 2004)
Developmental Building Blocks for Language

(Alexander & Heilman, 2006; adapted)

- **1 MONTH**
  - Phonology (Form)

- **9 MONTHS**
  - Expressive Language
  - Semantics (Meaning)
  - Syntax (Form)

- **18 MONTHS**
  - 5 YEARS
  - Receptive Language
  - Reading
  - Writing
  - Spelling
  - Pragmatics (Function)

- **9 YEARS**
  - Expressive Language
  - Metalinguistics
  - Semantics (Meaning)
  - Syntax (Form)

Diagram notes:
- Phases marked with red arrows illustrate the development sequence.
- Blocks labeled in yellow and white indicate key language components.
Developmental “READING Building Blocks” building a solid foundation for reading

**COMPREHENSION**

(Conway, 2013)

**READING FLUENCY**

- **SOUND OUT WORDS** (phonology/decoding)
- **SIGHT WORDS** (visual memory)
- **VOCABULARY** (semantic knowledge)
PHONOLOGY
(Perception & Production)

Executive Function / Intention

Working Memory
(Hold / Manipulate)

Prosodic
(Word Level)

Phonemic Representation

Oral Motor

Somatosensory

Acoustic

Visual

Attention / Arousal

(Alexander & Slinger, 2004)
Typical READING Development

EXECUTIVE FUNCTION / INTENTION

ORTHOGRAFIC
ARTICULATORY
PHONOLOGIC
PROSODIC
MORPHO-SYNTACTIC
ATTENTION / AROUSAL

WORKING MEMORY
(HOLD / MANIPULATE)

SEMANTIC/LEXICAL
PHONICS RULES
SYNTACTIC

(Alexander & Slinger, 2004)
DYSLEXIA

READING (PERCEPTION & PRODUCTION)

EXECUTIVE FUNCTION / INTENTION

WORKING MEMORY (HOLD / MANIPULATE)

ORTHOGRAHIC ARTICULATORY PHONOLOGIC PROSODIC

SEMANTIC/LEXICAL PHONICS RULES SYNTACTIC

ATTENTION / AROUSAL

ORTHOGRAPHIC ARTICULATORY PHONOLOGIC PROSODIC

SYNTACTIC

LEXICAL

(Semantic/lexico, 2004)
Levels of evidence
Research-based
- a dyslexia program includes components, eg phonological awareness, that scientific research says should be included in an effective dyslexia program.
- Is THIS the best we can do?
Consensus-based

- Unfortunately, the most common and lowest caliber of support. Basically, this means that if a group of people are using a program, then it must be productive, as that group are using it.

- Is THIS the best we can do?
Anecdotal
- personal opinions about a dyslexia program’s success, but without any scientific evidence of the program’s effectiveness.
- Is THIS the best we can do?
Evidence-based
- Peer reviewed, strictly adheres to scientific method, published in professional journal
  - HOWEVER, within "Evidence-based" research, some programs have LOW, Moderate or HIGH effectiveness or change. Which do you want for your child or student?
- Is THIS the best we can do?
Is this an example of evidence-based, research-based, consensus-based, anecdotal information?
A Program of Scientific Research
- initiated by The Morris Center in 1991;
- current version of this treatment program is called “NOW! Foundations for Speech, Language, Reading and Spelling® program;
www.NOWprograms.net
Is this an example of evidence-based, research-based, consensus-based, anecdotal information?
Intensive Remedial Instruction for Children with Severe Reading Disabilities: Immediate and Long-term Outcomes From Two Instructional Approaches


Abstract

Sixty children with severe reading disabilities were randomly assigned to two instructional programs that incorporated principles of effective instruction but differed in depth and extent of instruction in phonemic awareness and phonemic decoding skills. All children received 67.5 hours of one-to-one instruction in two 50-minute sessions per day for 8 weeks. Both instructional programs produced very large improvements in generalized reading skills that were stable over a 2-year follow-up period. When compared to the growth in broad reading ability that the participants made during their previous 16 months in learning disabilities resource rooms, their growth during the intervention produced effect sizes of 4.4 for one of the interventions and 3.9 for the other. Although the children’s average scores on reading accuracy and comprehension were in the average range at the end of the follow-up period, measures of reading rate showed continued severe impairment for most of the children. Within 1 year following the intervention, 40% of the children were found to be no longer in need of special education services. The two methods of instruction were not differentially effective for children who entered the study with different levels of phonological ability, and the best overall predictors of long-term growth were resource room teacher ratings of attention/behavior, general verbal ability, and prior levels of component reading skills.

Journal of Learning Disabilities 2001 v34-1, 33-58

[Addendum: Latest version of the most effective PASP treatment program is called: NOW! Foundations for Speech, Language, Reading and Spelling(R) www.NOWprograms.net]
Torgesen, et al., in AJ Fawcett (Ed), 2001; N=30, 8-10 year olds; 40% staffed out ESE by year 1 follow-up

www.NOWprograms.com
8-10 yr old Dyslexics made Immediate & Lasting Gains in Decoding & Comprehension

Start of 8-Week Intensive Intervention [NOW! Foundations™ program]

Before Intervention

16 Mos. Special Ed Class

After Treatment

Initial Eval

1 Year After Treatment

2 years After Treatment

N=30, 8-10 year old Dyslexics; 40% read on grade level & left Special Ed by yr 1 follow-up

www.NOWprograms.net

Torgesen, et al., 2001
Is this an example of evidence-based, research-based, consensus-based, anecdotal information?
This program works people. I can attest to it. Look forward to the book. "How I Learned To Spell" as a man.

Tim Conway, PhD @TheMorrisCenter
How did a lifelong dyslexic, who spoke at US Senate Dyslexia Caucus, improve his reading & spelling? www.NOWprograms.net – improve your spelling
Is this an example of evidence-based, research-based, consensus-based, anecdotal information?
Preventing Reading Failure in Young Children With Phonological Processing Disabilities: Group and Individual Responses to Instruction

Joseph K. Torgesen, Richard K. Wagner, and Carol A. Rashotte
Florida State University

Patricia Lindamood
Lindamood-Bell Learning Processes

Elaine Rose
Rose Speech and Academic Center

Tim Conway
University of Florida and The Morris Center

Cyndi Garvan
University of Florida

The relative effectiveness of 3 instructional approaches for the prevention of reading disabilities in young children with weak phonological skills was examined. Two programs varying in the intensity of instruction in phonemic decoding were contrasted with each other and with a 3rd approach that supported the children’s regular classroom reading program. The children were provided with 88 hr of one-to-one instruction beginning the second semester of kindergarten and extending through 2nd grade. The most phonemically explicit condition produced the strongest growth in word level reading skills, but there were no differences between groups in reading comprehension. Word level skills of children in the strongest group were in the middle of the average range. Growth curve analyses showed that beginning phonological skills, home background, and ratings of classroom behavior all predicted unique variance in growth of word level skills.

Only the PASP method helped 91% pass K or Grade 1 despite entering school in the bottom 12%. PASP is currently called "NOW Foundations for Speech, Language, Reading and Spelling" program
FULL LITERACY?
Early Intervention = Prevention

“....treatment was [only] relatively ineffective in normalizing the phonetic reading skills of approximately 2.4% of children in the total population from which our treatment sample (the bottom 10%) was selected.”

(Torgesen, Wagner & Rashotte, 1997; Torgesen, et al., 1999)
5 yr olds High-Risk for Dyslexia: NOW! Foundations®! (NF) was Most Effective
A Neuro-developmental Intervention is Powerful Early Intervention

N = 40 per group, began at 2nd half of Kindergarten, all students scored <15th percentile for pre-literacy skills & were high-risk for dyslexia. (Torgesen, ..., Conway, 1999, Jnrl of Ed Psych v91)

www.NOWprograms.net
5-yr olds High-Risk for Dyslexia got NOW! Foundations & at Grade 2 and Grade 4 they Read On Grade Level

**Before intervention, the average score on pre-literacy skills was <15th percentile in Kindergarten (Torgesen, et al, 2003) [www.NOWprograms.net](http://www.NOWprograms.net) NOW! Foundations for Speech, Language, Reading and Spelling®!
Is this an example of evidence-based, research-based, consensus-based, anecdotal information?
Is this an example of evidence-based, research-based, consensus-based, anecdotal information?
Effective Treatment is NEW Brain Wiring & Networks

This is Developmental Dyslexia Rewired

Treatment = Increased activity in left side of brain’s language cortex (same as typical readers’ brain activity)

Decreased activity in right side of brain (not the language side)

(Simos, et al., 2002)
BRAIN ACTIVITY DURING READING

Child #1: Normal Reader
Right Hemisphere
Left Hemisphere

Child #12: with Reading Difficulties

“SIGNATURE” DYSLEXIC BRAIN

(Simos, et al 2002)
Altering Cortical Connectivity - Remediation Induced Changes in the white matter for poor readers.
Evidence-based & HIGHLY EFFECTIVE programs are the BEST OPTION FOR ALL STUDENTS WITH DYSLEXIA.

Orton-Gillingham is a LOW effectiveness program and provides far less improvement than HIGH effectiveness programs (See David Kilpatrick's recent book on Dyslexia/poor reading, 2015)

- Peer reviewed, strictly adheres to scientific method
Research-based [Good]
- a dyslexia program includes components, eg phonological awareness, that scientific research says should be included in an effective dyslexia program.
Consensus-based [ok]
- Unfortunately, the most common and lowest caliber of support. Basically, this means that if a group of people are using a program, then it must be productive, as that group are using it.
Anecdotal [sames as guessing] - personal opinions about a dyslexia program’s success, but without any scientific evidence of the program’s effectiveness.
The Brain’s “FRIENDS” for BEST Learning

**Frequent Instruction** - minimum of 45 minutes per day

**Really Intensive Instruction** - EVERY day, 5-days per week

**Instruction is Generalized**
- teach how to use new skills in real life activities

**Evidence-based & Highly-Effective Instruction**
- professional research shows program REALLY works well and HOW to provide the instruction

**Neurodevelopmental Instruction**
- basic skills are trained first, then mid-level, then advanced skills are trained

**Duration of Instruction Occurs Until Automaticity**
- months of all "Friends" until automaticity aka autopilot!

**SPECIFIC GENERALIZATION** – direct training in how to use new skills in new settings (from clinic to school to home to …..)

[New learning happens best with "FRIENDS" experiences]
“I can admire the intentions and self-reliance and yet assert that as a way to figure out how reading works and what to teach, this process is inadequate. Large numbers of people sharing observations and insights is not sufficient to converge on what is true about reading. The sharing process is subject to distortions and biases because the data are noisy. Under these conditions, groups can converge on ideas that are logically inconsistent or demonstrably false and also supremely difficult to correct.”

Thank You

www.TheMorrisCenter.com
www.TheMorrisCentreTT.com
www.NOWprograms.net
www.EinsteinSchool.us

email: info@MorrisCenters.com
email: info@NOWprograms.com
EXTRA SLIDES - Stroke Research on how we can successfully improve reading skills that were impaired after stroke/brain injury; We CAN rebuild/repair brain networks with new wiring/learning and improve reading skills even after brain injury.
Treatment of a case of phonological alexia with agraphia using the Auditory Discrimination in Depth (ADD) Program

TIM W. CONWAY,1,3 PATRICIA HEILMAN,3 LESLIE J.G. ROTHI,2,4 ANN W. ALEXANDER,3 JOHN AD AIR,5 BRUCE A. CROSSON,1 AND KENNETH M. HEILMAN2,4

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(RECEIVED NOVEMBER 15, 1997; ACCEPTED MARCH 2, 1998)

Abstract

Phonological alexia and agraphia are acquired disorders characterized by an impaired ability to convert graphemes to phonemes (alexia) or phonemes to graphemes (agraphia). These disorders result in phonological errors typified by adding, omitting, shifting, or repeating phonemes in words during reading or graphemes when spelling. In developmental dyslexia, similar phonological errors are believed to result from deficient phonological awareness, an oral language skill that manifests itself in the ability to notice, think about, or manipulate the individual sounds in words. The Auditory Discrimination in Depth (ADD) program has been reported to train phonological awareness in developmental dyslexia and dysgraphia. We used a multiple-probe design to evaluate the ADD program’s effectiveness with a patient with a mild phonological alexia and mixed agraphia following a left hemisphere infarction. Large gains in phonological awareness, reading and spelling nonwords, and reading and spelling real words were demonstrated. A follow-up reassessment, 2 months posttreatment, found the patient had maintained treatment gains in phonological awareness and reading, and attained additional improvement in real word reading. (JINS, 1998, 4, 608–620.)

Keywords: Alexia, Phonological alexia, Cognitive rehabilitation
Fig. 1. Three reading probes at each stage of ADD program treatment and one spelling (nontreatment) probe.
Multimodal Treatment of Adults with Post-stroke Phonological Alexia: Behavioral and fMRI Outcomes

T. Conway, D. Szeles, F. Bowden, S. Uhazie, J. Gilbert, C. Hamm, P. Prilutsky, B. Crosson, & L. Gonzalez-Rothi

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cUniversity of Florida, Department of Speech, Language and Hearing Sciences, Gainesville, Florida
dUniversity of Florida, Department of Neurology, Gainesville, Florida

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Does Effective Treatment, Based on the Scientific Method, Rewire the Brain?

YES - new activity either around the left side area of brain injury or if that left side area of damage is too large, then patients showed new wiring in the right side of the brain. see next slide for example of new wiring in left side area of damage (image is reversed R is L)

Title (150 characters): Evidence-based, research-based, consensus-based or anecdotal support for a dyslexia treatment method: What’s the difference and why should you care?

Description for Program (600 characters): The term evidence-based is popular with reading instruction programs, but what does it mean for something to be evidence-based? Do all programs that claim the title meet the standard? In this session, Dr. Tim Conway, a research neuropsychologist with 30 years of experience with dyslexia, presents a working definition of evidence-based, and provides criteria for judging what type of evidence for effectiveness a program actually has. He provides a clear understanding of which type of support is most meaningful, and the merits and weaknesses of other types of support.

Detailed Description for Review (3,000 characters): Prominent dyslexia researchers, international organizations and grassroots parent groups have all called for evidence-based reading instruction to be adopted by the school systems in every state. Many popular publishers claim their programs are evidence-based, but how do they define this term? Sadly, reading proficiency levels have remained relatively stagnant for over 20 years. Also, 95% of students with learning disabilities are poorly served by the programs currently in use, as only 5% of students with dyslexia staff out of ESE or Special Education services.

So what does it mean for reading instruction to be evidence-based? If many of our reading instruction programs are not evidence-based, then what type of evidence of effectiveness do they have?

Dr. Tim Conway, research neuropsychologist and Director of The Morris Center Clinics, CEO of the EdTech online Neuro-development of Words - NOW! Company and co-founder of the nation’s first, free charter school for children with dyslexia and learning disabilities, presents an accessible walk through four types of support, discussing merits and weaknesses, and pointing out which type of support is most meaningful. Dr. Conway will explore the definition of “evidence-based” support, and the high-caliber of scientific research needed to make the claim. He will also discuss the following types of support that, while common, are a lower caliber of support for the effectiveness of the program.

Research-based - implying that a dyslexia program includes components, eg phonological awareness, that scientific research says should be included in an effective dyslexia program.

Anecdotal - personal opinions about a dyslexia program’s success, but without any scientific evidence of the program’s effectiveness.

Consensus-based - Unfortunately, the most common and lowest caliber of support. Basically, this means that if a group of people are using a program, then it must be productive, as that group are using it.

Knowing the difference in these types of evidence for effectiveness can better equip administrators, teachers, program directors and parents to select the method/program that will most likely provide the largest gains or improvement in skills. Dr. Conway brings the perspectives of a researcher, program developer, medical dyslexia clinic’s Administrative Director, founder of the nation’s first evidence-based charter school for dyslexia and parent of children with dyslexia. His professional experiences and education are unique and invaluable resources in helping parents, educators and clinicians select programs that will likely do the most good in improving reading skills.