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SCHOOLS & COMMUNITIES

Learning Disability Identification: How to get more bang for your buck

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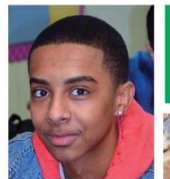2017 Oregon RTIi Conference

Questions

- Go to www.menti.com

- Use the code **33 98 88**

What's going on in the world?

LD Identification research

The debate: Cognitive testing or no?

Response to Instruction

vs.

Pattern of Strengths and Weaknesses

vs.

IQ Discrepancy

PSW: Some History

Learning Disabilities Association of America White Paper

(1) the statutory definition of LD should be maintained

(2) neither an IQ achievement discrepancy or a failure to respond to intervention is sufficient for LD identification

(3) PSW methods make the most empirical and clinical sense

(4) comprehensive psychoeducational evaluations should occur for the purposes of LD identification

(5) the results of cognitive and neuropsychological results should be utilized for intervention planning and LD identification

PSW: Counterpoint

Consortium for Evidence-Based Early Intervention Practices [CEBEIP], 2010

- LDA statements where "from an unrepresentative small sample of experts whose potential conflicts were not sufficiently disclosed"

- the **conclusions presented by LDA were not sufficiently supported by scientific evidence**

Statutory definition of LD

Collection of evidence

*"The term 'specific learning disability' means a disorder in **one or more of the basic psychological processes** involved in understanding or in using language, spoken or written, which may manifest itself in an imperfect ability to listen, speak, read, write, spell, or to do mathematical calculations" (U.S. Office of Education, 1968, p. 34).*

–This does not indicate that cognitive processes must be measured

–IDEA regulations do not support assessment of psychological or cognitive processing, b/c no evidence supports their necessity

Make most empirical and clinical and sense
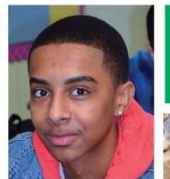
Reliability

- Simulation Studies
  - Stuebing, Fletcher, Branum-Martin, & Francis, 2012
  - Taylor, Miciak, Fletcher, & Francis, 2016
- Empirical Studies
  - Miciak, Fletcher, Stuebing, Vaughn, & Tolar, 2014
  - Miciak, Taylor, Denton, & Fletcher, 2014
  - Kranzler, Floyd, Benson, Zaboski, & Thobodaux, 2015

Simulation of PSW Methods (Stuebing et al., 2012)

- Of 10,000 assessments:
  - CDM: 1,558 identified as LD (8,436 as not LD); **25 correct, so 1,533 are false positives** and get the wrong treatment
  - XBA: 678 would be identified as LD (9,322 not LD); **353 correct, 325 are false positives** and get the wrong treatment

Are PSW methods interchangeable?

	Approach	
Approach	C/DM	XBA
C/DM	-	**30.0**
XBA	**0.11**	-

Miciak, Fletcher, et al., 2014

Are PSW methods (C/DM) robust across different tests?

- *Kappa* = .28
- Percent positive agreement = 62%
- Percent negative agreement = 67%
- Also little overlap in the achievement domain identified as most impaired

Miciak, Taylor, et al., 2014

Results

- *Kappa* = .28
- Percent positive agreement = 62%
- Percent negative agreement = 67%
- Also little overlap in the achievement domain identified as most impaired

Are these results specific to the sample and measures?

- Simulated > 70,000 latent correlations between a cognitive strength, cognitive weakness, and academic weakness

- Compared agreement for battery 1 and battery 2

Taylor et al. (2016)

Agreement between two batteries

Achievement Value			Test 2	
			Yes	No
	Test 1	Yes	0.42	
< 85		No		0.98

- Positive agreement **does not exceed chance** levels of agreement.

Results essential for intervention planning
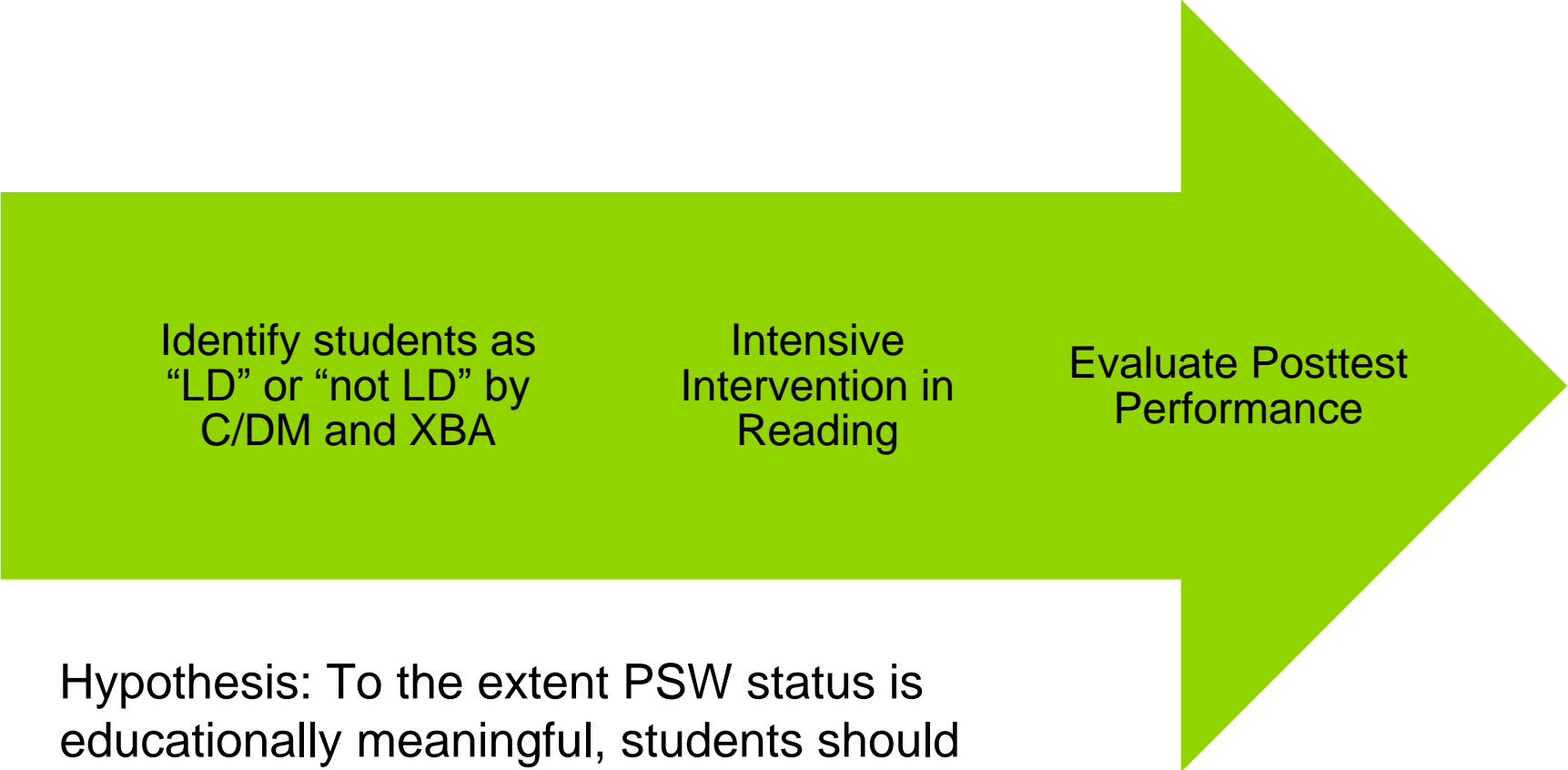
Collection of evidence

- Aptitude-treatment interventions:

  – *the evidence for such interactions is at best fragmentary and often contradicted* (Pashler, McDaniel, Rohrer, & Bjork, 2008)

  – *no evidence for a group by treatment interaction such that cognitively focused interventions aimed at students with specific cognitive deficits produce better effects* (Kearns & Fuchs, 2013).

Validity of PSW Methods for LD Identification

Identify students as "LD" or "not LD" by C/DM and XBA

Intensive Intervention in Reading

Evaluate Posttest Performance

Hypothesis: To the extent PSW status is educationally meaningful, students should respond differently to the same intervention.

Miciak et al. (2015)

Results

- Conducted 39 contrasts to evaluate whether LD status or inclusionary criteria specified by the C/DM & XBA methods were significant predictors of intervention response.

- Among 39 contrasts : **4 were statistically significant.**

- Only one contrast (Gc => Word Reading) predicted **> 1%** of the variance at posttest.

- **Academic Achievement Pretest** predicted between **53% and 69%** of the variance at posttest.

But what about that one?

Pretest only →

Cross tabulation of predictions based on $r^2 = .828$ and a cut point for pass/fail of 25th percentile		
	Pass	Fail
Pass	670	76
Fail	76	178
Total number of misclassifications =		**152**

Pretest + Go Status →

Cross tabulation of predictions based on $r^2 = .838$ and cut point for pass/fail of 25th percentile		
	Pass	Fail
Pass	672	73
Fail	74	181
Total number of misclassifications =		**147**

Recent conversation
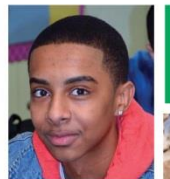
Cross-battery method (XBA)

- Kranzler et al., 2016
  - Specificity—true negative rate
  - Negative predictive value (NPV) is the probability that a cognitive weakness is not present when no academic weaknesses are observed.
  - Sensitivity—true positive rate
  - Positive predictive value (PPV) is the probability that a predicted cognitive weaknesses will be observed when an academic weakness is present.

XBA debate

Kranzler et al. (2016)

- Specificity—92%

- NPV—89%

- Sensitivity—21%

- PPV—34%

Flanagan & Schneider (2016)

- Simulations eliminate the importance of the human element
- **Only utilized single measures for measured construct**

XBA debate continued

- Rejoinder to Flanagan and Schneider (2016)
  - Kranzler, Floyd, Benson, Zaboski, & Thibodaux (2016)

What about multiple measures?

Single measure

- Specificity—98.8%
- NPV—94.2%
- Sensitivity—49.1%
- PPV—48.8%

Multiple measures

Looked at increase in % true positives:

Best case scenario:

3% increase in correct classifications

Miciak & Taylor (2017)

What does evidence support

- Learning disabilities are dimensional
- All methods based on strict cut points will demonstrate limited reliability
- Cognitive Discrepancy models demonstrate poor validity
- RTI models demonstrate good validity

Point counterpoint from pillars

Fletcher & Miciak (2017)

- Cognitive tests not necessary
  - What is the cost
    - *If cognitive assessment does not improve the reliability or contribute to intervention outcomes, we cannot afford them.*
    - *Funds spent for assessment may reduce funds available for intervention, which is a higher priority.*
  - "unexpected underachievement."
    - Unexpected underachievement in the presence of quality instruction

Schneider & Kaufman (2017)

- Cognitive abilities are integral to academic difficulties

- Current evidence to support their usefulness in informing identification and treatment of LD is not strong

  - *After rereading dozens of papers defending such assertions, including our own, we can say that this position is mostly backed by rhetoric in which assertions are backed by citations of other scholars making assertions backed by citations of still other scholars making assertions (p. 1).*

- Must continue to build the evidence base.

Cognitive assessment for LD

Can we afford it?

Allocating less money
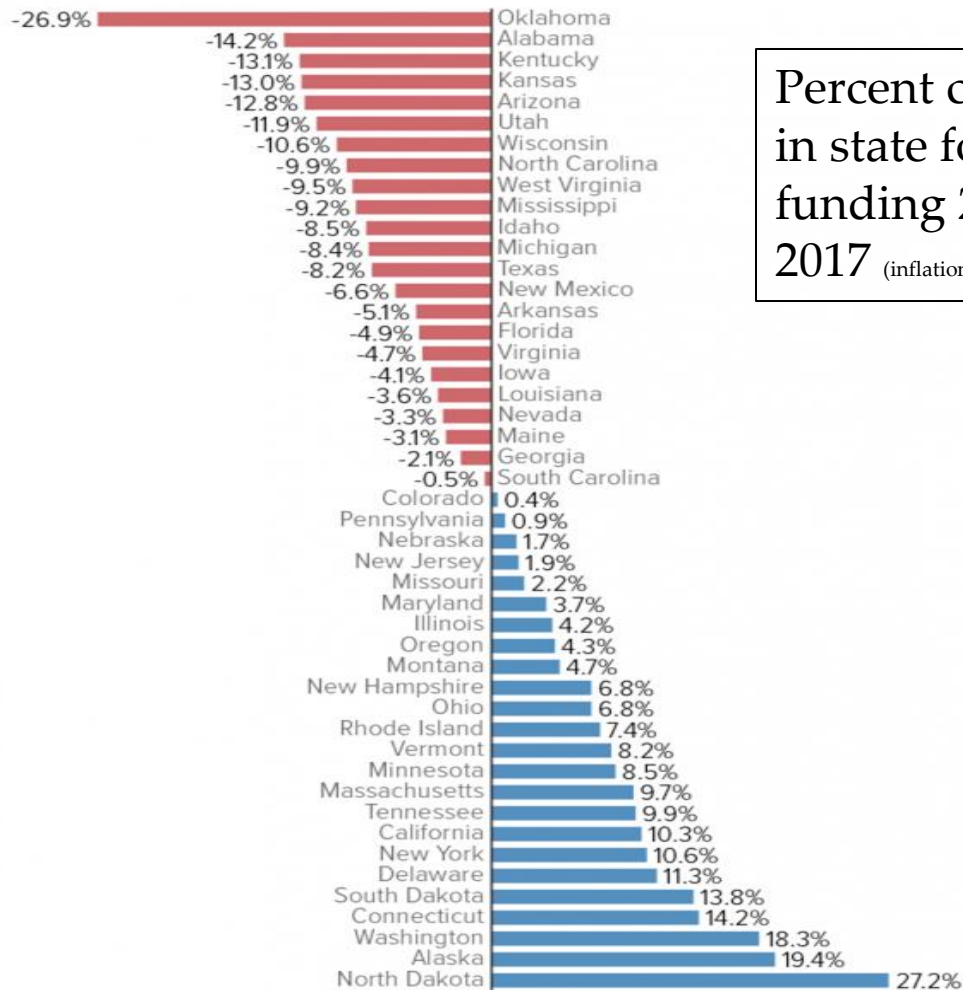
Percent change in state formula funding 2014-2017 (inflation adjusted)

Population growing

K-12 Education Jobs Have Fallen as Enrollment Has Grown

Change third quarter 2008 to third quarter 2016

1,120,000

-221,000

Education jobs   Student enrollment

SPE is a big part

Per Pupil Spending & Spec Ed Shares
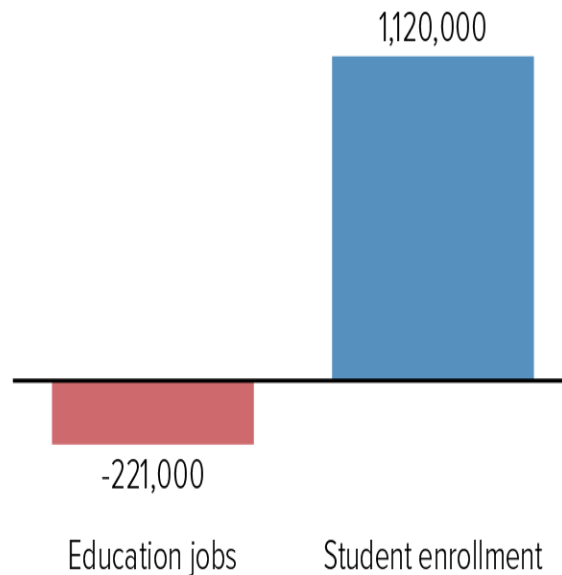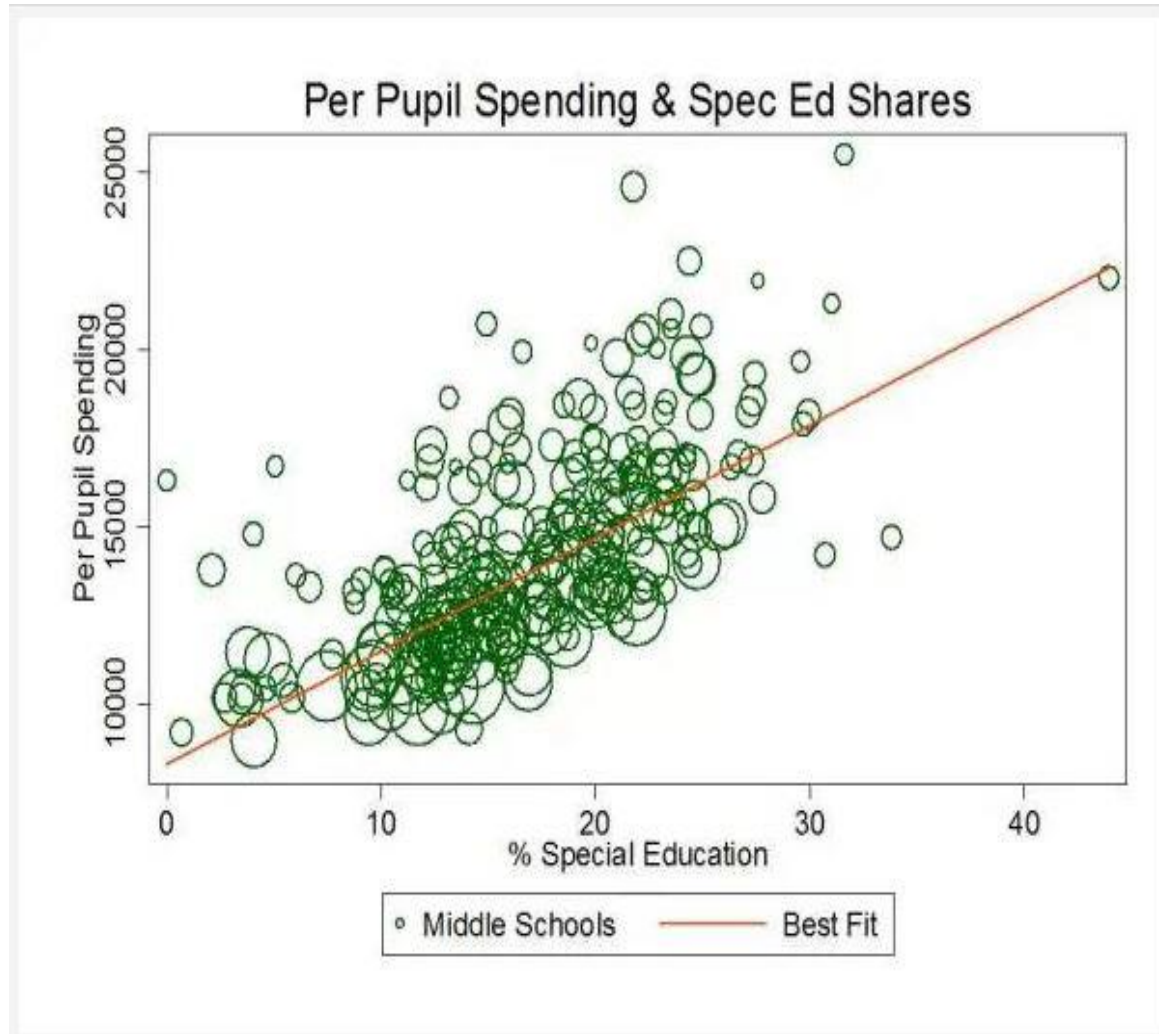
Taking in less money

Five of Eight States With Deepest K-12 Cuts Also Cut Income Taxes

States with deepest formula funding cuts,*
2008-2017

Also cut personal or corporate income tax rates since 2008

Percent	State
-26.9%	Oklahoma
-14.2%	Alabama
-13.1%	Kentucky
-13.0%	Kansas
-12.8%	Arizona
-11.9%	Utah
-10.6%	Wisconsin
-9.9%	North Carolina

RTI vs. PSW

RTI process

- **Struggles in Core instruction**
- **Tier 2 intervention/data collection**
- **Tier 3 intervention/data collection**
- **Referral for LD**
- **Identify as Learning Disabled**

PSW process

- Struggles in Core instruction
- Tier 2 intervention/data collection
- Tier 3 intervention/data collection—
- Referral for LD
- Administer Cognitive tests
- Identify as Learning Disabled

WISC-IV/WIAT-III
Diagnostic *reading* Cross Battery Assessment protocol

Broad Ability	Narrow ability	Initial Subtests	Follow-up subtests
Gf	I--Induction	WISC-IV Matrix reasoning	WIAT-III Reading comprehension
	RG-Deduction	WJ-IV-COG Analysis synthesis	KABC-II Story completion
Gc	LS--Listening ability	WIAT-III Listening comprehension	WJ-IV -Ach Oral comprehension
	KO-General information	WISC-IV Information	WISC-IV Comprehension
	VL-Lexical knowledge	WISC-IV Vocabulary	WISC-IV Similarities; Word reasoning
Gsm	MS-Memory Span	WISC-IV Digit span-forward	WJ-IV -COG Memory for words
	MW-Working memory	WISC-IV Letter-number sequencing	WISC-IV Digit span backwards
Gv	MV-Visual memory	WJ-IV COG Picture recognition	DAS-II Recognition of pictures
	Orthographic processing	Test of Orthographic Competence (TOC)	Early Reading Assessment (ERA)
Ga	PC-Phonetic coding	WIAT-III Early reading skills	WJ-IV COG Sound blending
	U-Speech-sound discrimination	WJ-III Diagnostic supplement Sound patterns voice	WJ-III DS Sound Patterns Music
Glr	NA-Rapid naming	WJ-IV COG Rapid picture naming	NEPSY-II Speeded naming
	MA-Associative memory	WJ-IV COG Visual auditory learning	WJ-III DS Memory for names
	M6-Free recall memory	NEPSY-II List Memory	DAS-II Recall of objects
	MM-Meaningful memory	WJ-IV ACH Story recall	WJ-IV ACH Story recall delayed
Gsm	RS-Reading speed	WIAT-III Oral reading fluency	WIAT-III reading fluency
	P-Perceptual speed	WISC-IV Symbol search	WISC-IV Cancellation
Attention		WJ-IV COG Attention clinical cluster	NEPSY-II Auditory attention and response
Executive functions		WJ-IV COG Executive processing cluster	NEPSY-II Animal sorting

Assessments required

1. **WISC-IV Matrix reasoning**
2. **WJ-IV-COG Analysis synthesis**
3. **WIAT-III Listening comprehension**
4. **Test of Orthographic Competence (TOC)**
5. **WJ-III Diagnostic supplement**
6. **NEPSY-II Auditory attention and response**
7. **Early Reading Assessment (ERA)**
8. **KABC-II Story completion**
9. **DAS-II Recall of objects**

PSW Evaluation Costs

Assessments	District #1 *(108 evaluations 31 schools)*	District #2 *(41 evaluations 18 schools)*
WISC-IV		
WIAT-III		
NEPSY-II	$8,098.00	$4,614.75
WJ-IV	$61,739.60	$35,848.80

	TOTAL ASSESSMENT COSTS	**$176,224.95**	**$102,236.85**

Assessments	District #1	District #2
WJ... supplement	19091.35	$11085.3
Early Reading Assessment (ERA)	$8,525.00	$4,950.00
KABC-II	$29,791.00	$17,298.00
DAS-II	$39,525.00	$22,950.00
TOTAL ASSESSMENT COSTS	**$176,224.95**	**$102,236.85**

Labor costs

Labor	District #1 (*108 evaluations 31 schools*)	District #2 (*41 evaluations 18 schools*)
XBA Training registration costs ($600/participant)	$18,600.00	$10,800.00
XBA Training Hours (21 hours)	$27,342.00	$15,876.00
Time to org... hour/evalua...		
Cost to adm... hours/evaluation)	*$15,876.00*	*$6,027.00*
Time to insert into software and analyze (1 hour/evaluation)	*$4,536.00*	*$1,722.00*
Time to organize additional data (1 hour/evaluation)	*$4,536.00*	*$1,722.00*
Time to incorporate into IEP report (1 hour/evaluation)	*$4,536.00*	*$1,722.00*
TOTAL LABOR/Training COSTS	**$79,962**	**$39,591**

TOTAL LABOR/Training COSTS   **$79,962**   **$39,591**

Total costs

	District #1 (*108 evaluations 31 schools*)	District #2 (*41 evaluations 18 schools*)
TOTAL ASSESSMENT COSTS	$176,224.95	$102,236.85
TOTAL LABOR/Training COSTS	$79,962	$39,591
TOTAL COSTS	$256,186.95	$141,827.85
Cost per evaluation	**$2372.10**	**$3459.22**

What will that get you

Effects of Interventions

Intervention	Mean effect size (targeted)	Mean Effect Size (broader)
Quickreads	0.22	0.21
Stepping Stones to Literacy	0.56	0.41
Sound Partners Kindergarten	0.83	NA

Alternatives for district

Intervention	Cost	District #1 $256,186.95	District #2 $141,827.85
Quickreads	≈$87 per student to purchase materials	**2945** sets of materials	**1630** sets of materials
Stepping Stones to Literacy	≈$50 per student to purchase materials	**5124** sets of materials	**2836** sets of materials
Sound Partners Kindergarten	≈$800 per student to implement annually	**320** students	**184** students served

Missing data

What % of referrals are identified as LD?

RTI process

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- Tier 3 intervention/data collection
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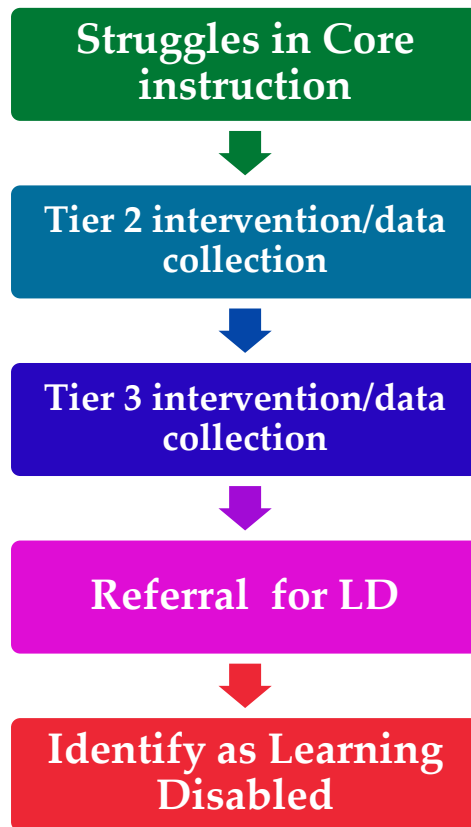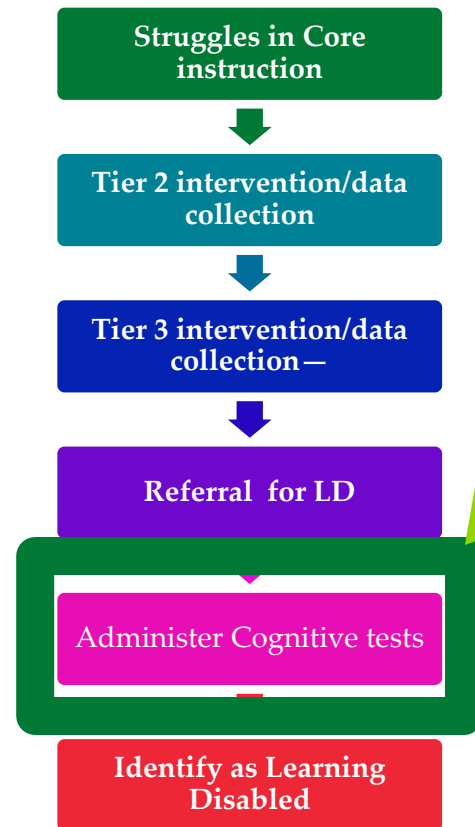
Move away from the historical focal point of "*which students qualify for help*" to simply

"*which students need help*" *(Miciak, 2015)*

Final Thought

Even though the psychometric difficulties may never be completely resolved, classification systems should at least be based on **a coherent psychology of helping**…

Although there is no shortage of children who experience problems in adjustment and the acquisition of essential skills, **assessments** *of the characteristics of these children* **are important** *to the extent that contributions are made to the* **design** **and evaluation** **of meaningful interventions.** " Macmann et al., 1989, p. 145-146.

Thank you

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