

DSM-5 changes in Intellectual Disability & Learning Disabilities

Member of DSM-5 Work Group on ADHD &
cross-appointed to Neurodevelopmental Disorders Work Group (for SLD)

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+ Presenter Disclosure

- **Speaker:** Rosemary Tannock, PhD

- **Relationships with commercial interests:**
 - **Grants/Research Support:** None/ Cogmed; Purdue Pharma
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 - **Consulting Fees:** Biomed Central (publisher) Editors Advisory Group
 - **Other:**
 - **Royalties:** Springer, as Co-Editor of book (*Behavioral Neuroscience of ADHD and its Treatment, 2011*)
 - Member DSM-5 Workgroup on ADHD, & liaison member to Neurodevelopmental Disorders workgroup (for Learning Disorders)
 - Member International Steering Committee for WHO International Classification of Functioning (ICF)-Core Set for ADHD
 - Affiliate member WHO ICD-11 Specific Learning Disorders subcommittee



+ What is the DSM?

- The DSM – **Diagnostic & Statistical Manual** - serves as a universal authority for psychiatric diagnosis in North America, South America, Australia, and many other European countries.
- The Manual specifies the diagnostic criteria for each recognized mental health disorder, and so provides a systematic & reliable approach to diagnosis
- Treatment recommendations, as well as payment by health care providers, are often determined by DSM classifications, so this tool has significant practical importance.....

+ Why is the DSM-5 important?

- **The Newfoundland & Labrador Department of Education and Early Childhood Development** recognizes the revised conceptualization & criteria as published in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5) for:
 - **Intellectual Disability (ID)**
 - **Specific Learning Disorder (SLD)**

+ Diagnosis: definition

- The identification of the nature of an illness or other problem by examination of the symptoms
- The act or process of identifying or determining the nature and cause of a disease or injury through evaluation of patient history, examination, & review of laboratory data.
- A diagnosis may indicate the need for & type of medical treatment; it does not indicate the person's learning needs.
- Diagnosis is a 'Regulated Health Act''



Exceptionality

- Departments of Education use the term ***exceptionality*** to identify patterns of strengths and needs common to groups of students, as determined through comprehensive assessment.
- These unique strengths & needs may be: cognitive, emotional, behavioural, medical, social, or physical
- Students with an exceptionality may access a range of school based services depending on degree of severity.

+ Educational versus Clinical assessment of ID and SLD

- In ***Education***, assessment is designed to:
 - Determine/confirm whether a student's difficulties result from an '*exceptionality*'
 - Clarify how the student's exceptionality impacts learning & functioning in the school context
 - Provide information that is relevant for & guides program planning
- In ***Clinical Practice***: assessment is designed to rule in/rule out a diagnosis
 - it provides information that is relevant for medical treatment; *psychological* assessment may also provide information relevant for educators & program planning

+ The History of DSM

- The World Health Organization's (WHO) was the first to clarify diagnostic criteria for medical disorders:
International Classification of Diseases (ICD)
 - Lists specific diagnostic criteria for all medical diseases, including mental disorders
- Each country may publish its own diagnostic manual based on the ICD: can modify the ICD provided the changes do not change its intent:
 - When the ICD is updated, each country updates their own diagnostic manual - compatible with the new ICD version
- **USA: American Psychiatric Association was assigned responsibility components of the ICD related to mental disorders: DSM-5 based on ICD-10 (ICD-11)**



DSM5 Organizational Structure

Scientific
Advisory
Committee

DSM5 – Task Force
Chair: David J. Kupfer; Vice-Chair:
Darrell Regier

Clinical &
Public Health
Committee

Task Force Members: 13 Work-group chairs & experts

Study Groups = 6

Dx Spectra

Gender &
culture

Impairment
Assessment

Diagnostic
assessment
instruments

Lifespan &
Development

Psychiatric &
general medical

Work Groups = 13

Neurodevelopmental
Disorders

ADHD & Disruptive
Behavior Disorders

+ Each work group was asked to...

- Determine, based on members' clinical and research knowledge, “*what works and what doesn't work*” for their assigned diagnoses in DSM-IV-TR
- Assess new research developments and clinical issues that have arisen since 1992
- Develop a research plan to investigate these issues, resolve problems, etc., using literature reviews and secondary data analyses

NEW DSM PROCESS: Required detailed documentation of scientific evidence to support every recommended change

(explanatory text plus tabulated & rated studies submitted to Scientific Review Committee & Public Health Committee for approval/rejection)

- ***Antecedent Validators***

- *Familial aggregation/co-aggregation (family, twin, adoption studies)*
- *Socio-demographic and cultural factors*
- *Environmental risk factors*

- ***Concurrent Validators***

- *Comorbidity*
- *Cognitive factors*

- ***Predictive Validators***

- *Diagnostic stability*
- *Response to Intervention*

- For major diagnostic changes: need evidence for 4 high-priority categories:
 - *Familial/genetic; diagnostic stability; course of illness; response to treatment*
- Rating Scale:
 1. = strong support;
 2. = moderate (acceptable) support;
 3. = modest (questionable) support;
 4. = limited (not justified) support;
 5. = poor support (not to include)



Major changes in emphasis in DSM-5

Sensitive to & reflect:

- developmental (lifespan) changes,
- sex differences
- cultural/international differences

+ DSM-5: 'Subtypes' versus 'Specifiers'

Subtypes:

- Distinctive
- Mutually exclusive
- Jointly exhaustive



Specifiers:

- provide an opportunity for the clinician to define more homogeneous sub-groupings of individuals with a specific disorder
- Provide information about the range of problems manifest at the time of assessment
- Provide information relevant for intervention & management



Specify Severity

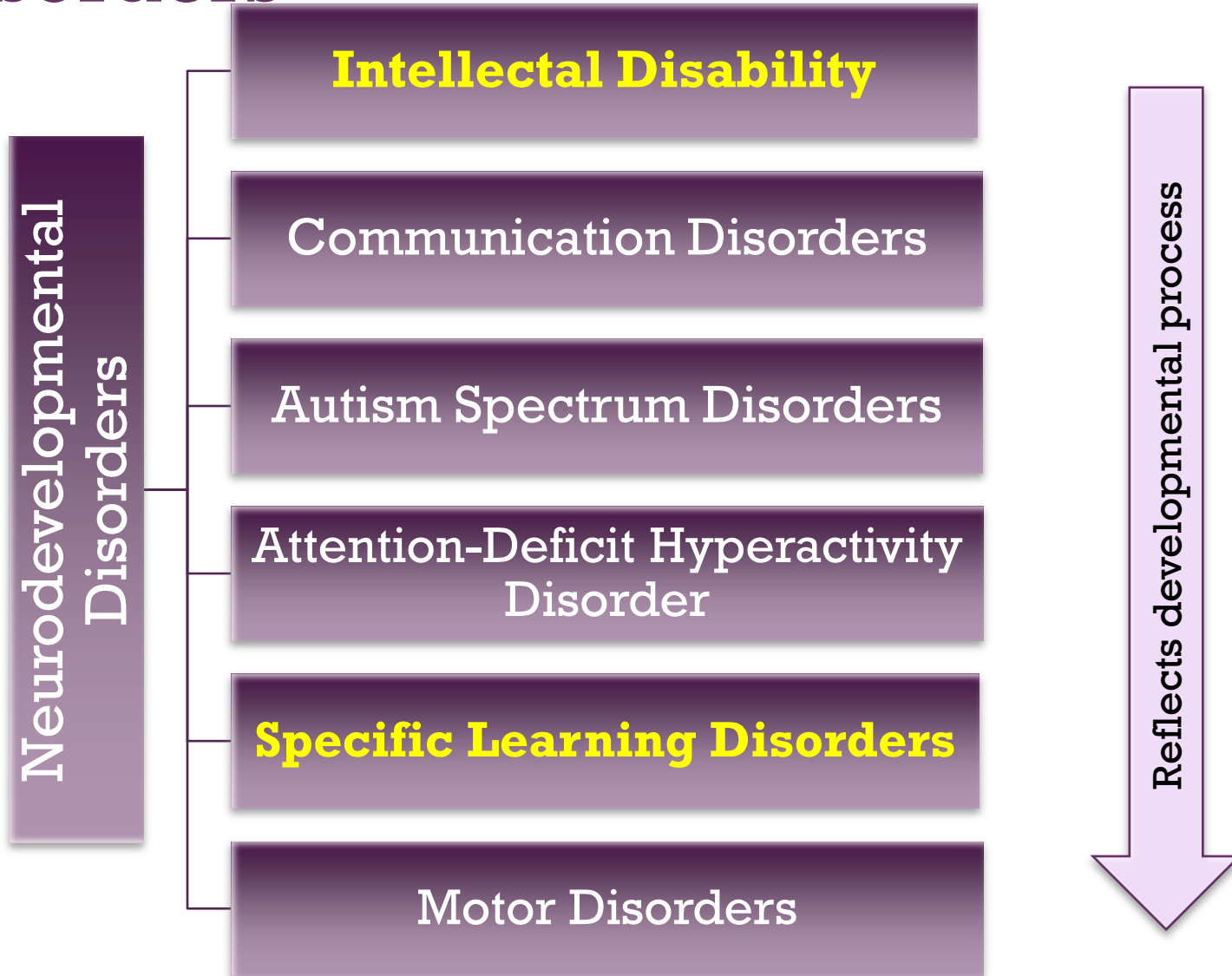
- Severity specifiers are provided to guide clinicians in rating the severity, frequency, duration, symptom count, & likely amount of support required to optimize functioning

DSM Process: a balancing act



Diagnostic criteria remain as behavioral descriptors:
potential etiological factors are summarized in the text

+ DSM-5: Neurodevelopmental Disorders



+ PRACTICE POINT: DSM-5 changes in Intellectual Disability & Specific Learning Disorder

- Reflects the growing concern about excessive & inappropriate reliance on IQ cut-offs for diagnosis
- Encourages clinicians to take into account various sources of test & measurement error
- Encourages clinicians to consider & integrate information from a broader array of sources

+ Quiz # 1 (discuss in small group)

1. What is the difference between a diagnosis & an exceptionality?
2. Describe one major advance in the DSM-5 revision process compared to the process used in previous revisions of DSM & why is this important for psychologists & educators?
3. What is the difference between DSM-5 Subtypes & Specifiers?

+ Questions, concerns, comments?





Intellectual Disabilities

Changes made in DSM-5

+ Newfoundland & Labrador Department of Education & Early Childhood Development **Exceptionality: Cognitive Disorder**

- Based on DMS-IV-TR
- significantly subaverage intellectual functioning
 - an IQ of approximately 70 or below;
- significant limitations in adaptive functioning in at least 2 of the following skill areas:
 - communication
 - self care
 - home living
 - social/interpersonal skills
 - use of community resources
 - self direction
 - functional academic skills
 - work
 - leisure
 - health & safety
- onset must occur before age 18 years

+ Plan for next set of slides

- Overview of major changes in DSM-5 Intellectual Disability (ID)
- Conceptualization & Diagnostic Criteria for ID
- Rationale for changes
- Practice Points: Cautions in application of the criteria

NB a few slides indicated by * are not in your handout, so I will slow down for you to make notes!

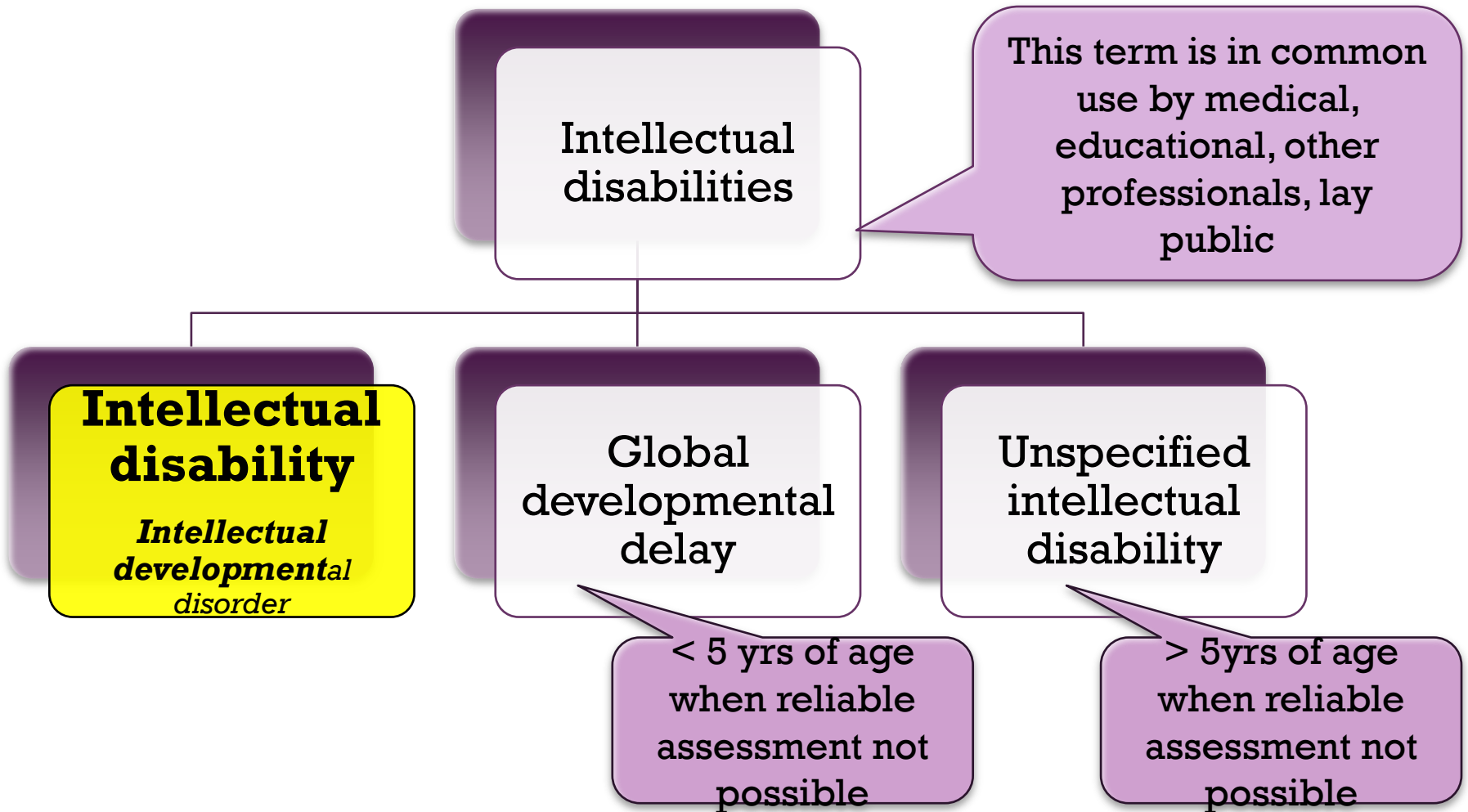
+ Overview of major changes in DSM-5 Intellectual disability

- **Its name**
 - formerly ‘Mental Retardation’ derogatory, stigmatizing
 - Better alignment with ICD, other professional disciplines, & organizations (AAIDD, US Dept Education)
- **Its impact on a person’s functioning**
 - Cognitive, social, practical (self-management)
- **Changes in criteria to encourage more comprehensive assessment and decrease reliance on psychometrics – IQ scores**
- **Specifiers for severity**

+ Comparison of definitions

Criteria	DSM-IV- TR/Ed.gov.nl.ca	DSM-5
Name	[Mental Retardation] COGNITIVE DISORDER	Intellectual Disabilities
A: Intellectual function	Significantly subverage intellectual functioning IQ \leq 70	Deficits (reasoning, problem- solving, planning, abstract thinking etc) confirmed by clinical assessment & individual standardized testing (IQ: 70 \pm 5) – <i>intellectual profile</i>
B: Adaptive function	Deficits in \geq 2 areas	Deficits in adaptive function result in failure to meet socio-cultural standards (e.g., lack of judgment) & related to intellectual impairments
C: Age at onset	Before age 18	During developmental period
Severity	Based on IQ	Based on adaptive function

+ DSM-5: Intellectual disabilities



+ DSM-5 Intellectual Disability

- Is not defined by psychometric test score alone
 - In other words Intellectual Disability is not defined solely by low full-scale IQ score on IQ test (i.e., $IQ \leq 70$)
- In practice, many clinicians do not assess adaptive functioning (or discount it) if the full-scale IQ score was 70-75 or higher

+ DSM-5: Intellectual Disability

Concept & Diagnostic Criteria

- A disorder of thinking & reasoning;
- Characterized by ‘gullibility’ - inability to recognize & avoid risk - & by limitations in everyday reasoning & social judgment
- *Must meet 3 criteria:*
 - Intellectual deficits
 - Adaptive functioning deficits
 - Age at onset in developmental period

+ Intellectual Disability: DSM-5 diagnostic criteria

A. Deficits in intellectual functions

(reasoning, problem-solving, planning, abstract thinking, judgment, academic learning, learning from experience)

- *Confirmed by clinical assessment & individualized standardized IQ testing*

+ Intellectual Disability: taking test & measurement error into account

- IQ test scores need to be interpreted within a reliability range of 5 points at the 95th percentile
 - Thus the upper full-scale IQ ceiling for ID is set at 75 (5th %ile)
 - That is, a ceiling of 2 standard deviations below the mean can be met with an IQ score as high as 75
- Need to correct for inflated scores due to use of a test with out-of-date norms (Flynn effect)
 - Consider lowering IQ score by 0.3 points for every year of norm obsolescence
- Need to keep in mind that full-scale IQ score may be invalid when there is excessive scatter among subscales

+ Limitations of IQ test scores

- “...are approximations of conceptual functioning but may be insufficient to assess reasoning in real life situations and mastery of practical tasks” (DSM-5)
- “Individual cognitive profiles based on neuropsychological testing are more useful for understanding intellectual disabilities than a single IQ score” (DSM-5. p.37)

+ ***The role of neuropsychological measures in assessment of ID

- Criterion A refers to intellectual functions that involve *reasoning, problem solving, planning, abstract thinking, judgment, learning from instruction & experience, & practical understanding*
 - Few of these abilities are tapped by IQ tests
- Calls for use of neuropsychological measures to supplement the Intelligence Quotient (e.g., measures of executive function)



SMALL GROUP DISCUSSION

What neuropsychological measures might you use & why?

+ BUT the same caution applies to interpreting neuropsychological test scores as to IQ scores

- Need to consider the individual's approach and error profiles on neuropsychological tests, not just the single test score
- The relationship between neuropsychological tests scores (performance) and real life functioning remains unclear
- Consider including rating scales of executive functioning...BUT cannot replace neuropsychological test scores with rating scale scores

[Toplak, West, Stanovich (2013). Practitioner review: do performance-based measures and ratings of executive function assess the same construct? *J Child Psychol Psychiatry*. 54(2):131-43]

Neuropsychological Tests & Rating Scales measure different aspects of performance

- **Behavior Ratings**

- *Performance in daily life*

- **Cognitive Tests**

- *Performance under artificial controlled conditions*

- The 2 types of measures cannot be used interchangeably

- *both are useful & valuable: provide different types of information in terms of assessment*

+ Intellectual Disability: DSM-5 diagnostic criteria

- B. Deficits in adaptive functioning** that result in failure to meet developmental & sociocultural standards for personal independence & social responsibility. Without ongoing support, the adaptive deficits limit functioning in one or more activities of daily life (e.g., communication, social participation, independent living) across multiple environments (e.g., home,, school, work, community)
- *Limited functioning in ≥ 1 area requiring ongoing support:, communication, social participation (limited awareness of others' cues, risk), independent living across multiple environments*

+ Intellectual Disability: Deficits in Adaptive Functioning

- “the deficits in adaptive functioning must be directly related to the intellectual impairments described in Criterion A” (DSM-5 p. 38)
- Fundamental problem faced by individuals with ID, is an inability to recognize & avoid risk
 - Physical risk (e.g., following crowd crossing road without checking safety)
 - Social risk (e.g., being victimized, bullied)

+ Intellectual Disability: DSM-5 diagnostic criteria

- c. Onset of intellectual & adaptive deficits during developmental period.** The age & characteristic features at age of onset depend on the etiology & severity of brain dysfunction”
- DSM-5 does not specify a ceiling age for when onset of impairments must be manifested

+ Intellectual Disability: Severity rating- MILD

Conceptual domain	Social Domain	Practical domain
<p><i>Preschool</i> – few if any differences; <i>School-age</i>, difficulties learning academic skills, with support needed. Concrete approach compared to peers</p>	<p>Immature in social interactions; problem perceiving peers' cues; Communication is more concrete; problems regulating emotion</p>	<p>Personal care OK; Need support in ADL compared to peers; in adults, need support with grocery shopping, transportation, home & child-care organization, cooking nutritious food, money</p>

+ Intellectual Disability: Severity rating; MODERATE

Conceptual domain	Social Domain	Practical domain
<p>All through development, the individual's conceptual skills lag markedly behind peers'</p> <p><i>Preschool</i> – language & preacademic skills develop slowly</p> <p><i>School-age</i> – progress in reading, writing, math, time & money is markedly limited</p>	<p>Spoken language much less complex than peers'.</p> <p>May develop relationships, but not perceive/interpret social cues correctly;</p> <p>Limited social judgment</p>	<p>Personal care & ADLD may be OK, but may need extensive teaching to attain age-appropriate skills.</p> <p>need support with to manage jobs, social expectation, transportation etc</p>

+ Intellectual Disability: Severity rating: SEVERE

Conceptual domain	Social Domain	Practical domain
<p>Attainment of skills limited; little understanding of written language or concepts of numbers, quantity, time, money</p>	<p>Spoken language limited in vocabulary & grammar; speaks in single words or phrases; Talk focused on here & now</p>	<p>Needs support for all ADL (meals, dressing, bathing, toileting); unable to make responsible decisions about well-being of self or others</p>

+ Intellectual Disability: Severity rating; PROFOUND

Conceptual domain	Social Domain	Practical domain
<p>Involve the physical world rather than symbolic processes; May use objects in goal-directed way for self-care, work, recreation; but co-occurring motor & sensory impairments may prevent functional use of objects</p>	<p>Limited understanding of symbolic communication in speech or gesture; but may understand some simple commands or gestures; expresses own desires/emotions via nonverbal non-symbolic means</p>	<p>Dependent on others for all daily physical care, health, & safety; those without severe physical impairments may be able to help with daily chores at home; needs support for recreational activities, such as listening to music, watching movies, going for walks</p>

+ SMALL GROUP DISCUSSION

- What advantages do you anticipate in using these criteria for ‘Cognitive Disorder’ (i.e., Intellectual Disability)?
- What challenges do you anticipate in using these criteria ‘Cognitive Disorder’ (i.e., Intellectual Disability)?

+ QUIZ #2 (discuss in small groups)

- Why is “full-scale IQ of approximately 70 or below” no longer considered appropriate for identifying ‘subaverage intellectual functioning’?
- What is the key concept of ID (Cognitive Disorder) in DSM-5 & how might this characteristic be expressed in the school setting?
- How will the severity criteria for ID influence program planning?

+ Global Developmental Delay

- To be used only for individuals < 5 years old
- Fails to meet developmental milestones in several areas of intellectual function
- Applies to individuals unable to undergo systematic assessment of IQ, including those too young for standardized testing
- SO need to reassess when older

+ Unspecified Intellectual Disability

- Reserved for individuals >5 years of age, whose intellectual functioning cannot be assessed due to sensory or physical impairments, or severe problems behavior or co-occurring mental disorder
- Requires reassessment

+ Intellectual Disability: synopsis of conceptual & measurement issues

- IQ scores are only approximations of conceptual functioning
- Need to interpret IQ scores within a reliability range of 5 points at the 95th confident interval (measurement error), which established upper IQ ceiling at 75 (5th percentile) rather than at 70 (2nd percentile):
Hence, 70 ± 5 points
 - Need to consider level of adaptive functioning – even in presence of IQ score around 70-75
 - Also need to consider the ‘Flynn effect’ – obsolete norms
- Adaptive functioning: assess via clinical evaluation & individualized, culturally appropriate, psychometrically sound measures, completed by knowledgeable informants (parent, family member, teacher, counselor, care provider)
- Severity rating based on adaptive functioning in the 3 major domains

+ Questions, concerns, comments?



Specific Learning Disorders

1. What was wrong with DSM-IV LD?
2. What changes were in DSM-5?
3. What was the evidence to support the changes?



Newfoundland & Labrador Department of Education & Early Childhood Development

Existing definition of Learning Disabilities

- Based on Learning Disabilities Association of Canada (2002)
- LDs refer to a number of disorders which may affect the acquisition, organization, retention, understanding or use of verbal or nonverbal information. These disorders affect learning in individuals who otherwise demonstrate at least average abilities essential for thinking and/or reasoning. As such, learning disabilities are distinct from global intellectual deficiency.
- LDs result from impairments in one or more processes related to perceiving, thinking, remembering or learning. These include, but are not limited to:
 - language processing; phonological processing; visual spatial processing; processing speed; memory and attention; and executive functions (e.g. planning and decision-making).



Newfoundland & Labrador Department of Education & Early Childhood Development

Existing definition of Learning Disabilities (continued)

- LDs range in severity & may interfere with the acquisition & use of one or more of the following:
 - oral language (e.g., listening, speaking, understanding)
 - reading (e.g., decoding, phonetic knowledge, word recognition, comprehension)
 - written language (e.g., spelling and written expression)
 - mathematics (e.g., computation, problem solving)
- Learning disabilities may also involve difficulties with organizational skills, social perception, social interaction & perspective taking.
- Specific learning disabilities include:
 - Reading Disorder; Disorder of Written Expression; Mathematics Disorder; Nonverbal Learning Disability



Psychiatric classification of LD



DSM-IV

Reading Disorder

Mathematics Disorder

Written Expression Disorder

Not otherwise specified (NOS)

ICD 10

Specific Reading Disorder

Specific Spelling Disorder

Specific Disorder of Arithmetic skills

Mixed disorder of Scholastic skills

Other developmental disorders of scholastic skills

developmental disorder of scholastic skills, unspecified

No problems in arithmetic permitted

+ DSM-IV-TR Diagnostic criteria for 315.00 Reading Disorder

- A. Reading achievement, as measured by individually administered standardized tests of reading accuracy or comprehension, is substantially below that expected given the person's chronological age, measured intelligence, and age-appropriate education.
- B. The disturbance in Criterion A significantly interferes with academic achievement or activities of daily living that require reading skills.
- C. If a sensory deficit is present, the reading difficulties are in excess of those usually associated with it.

+ Weaknesses in DSM-IV LD identified by Work Group & Advisory Committee

- Lack of definition/criteria for LD per se
- Questionable validity of the DSM-IV subtypes of LD: *Reading Disorder, Mathematics Disorder, Disorder of Written Expression, NOS*
- Questionable validity of the psychometric criterion (IQ-Achievement discrepancy) that forms major diagnostic criterion for each LD

+ Plan for next set of slides

- Overview of major changes in DSM-5 Specific Learning Disorder (SLD)
- Conceptualization & Diagnostic Criteria for SLD
- Rationale for changes
- Practice Points: Cautions in application of the criteria

NB a few slides indicated by * are not in your handout, so I will slow down for you to make notes!

1. SLD conceptualized as a Neurodevelopmental Disorder

F-0 Neurodevelopmental Disorders

- **Intellectual Disability**
- **Autistic Spectrum Disorder**
- **Communication Disorders**
- **Developmental Motor Co-ordination Disorder**
- **Attention-Deficit/Hyperactivity Disorder**
- **Specific Learning Disorder**

+ SUMMARY of DSM-5 changes to SLD

1. Single overarching category (SLD)

- With *Specifiers* for current manifestations

2. Elimination of IQ-achievement discrepancy criterion. Replaced with 4 criteria:

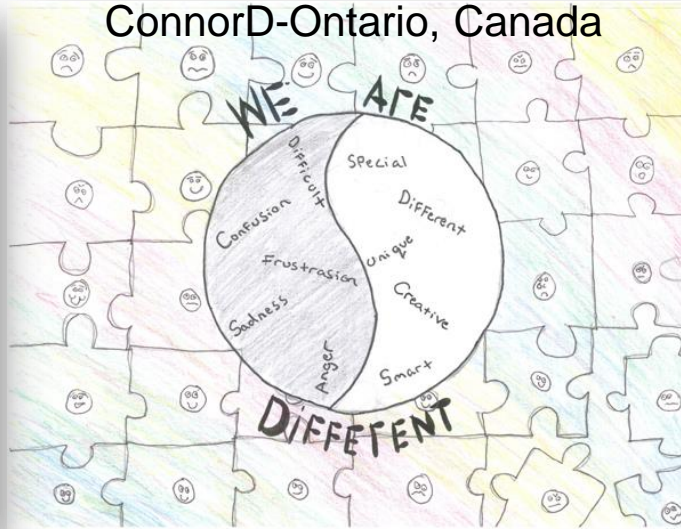
1. Persistence of symptoms for at least 6 months despite focused intervention
2. Low academic achievement causing significant impairment
3. Age at onset in school-age years (may manifest fully later)
4. Not attributable to Intellectual Disorder, uncorrected visual or auditory acuity, other mental or neurological disorders, psychosocial adversity, lack of proficiency in the language of academic instruction, or inadequate instruction

3. Severity Rating

Learning Disorders



TianaL-Whitestone-NY



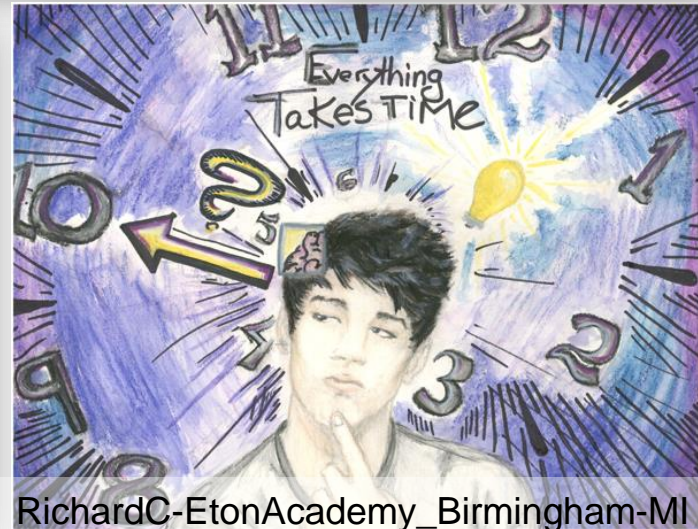
ConnorD-Ontario, Canada



ZacC-utsonSchool-IN



Matthew-V-Linwood-New Jersey



RichardC-EtonAcademy_Birmingham-MI

+ ***DSM-5 conceptualisation of SLD

- SLD refers to significant and persistent difficulties learning and using one's cultural symbol systems (e.g., alphabet, characters, Arabic numerals) that are required for skilled reading, writing, and arithmetic, and which must be taught
- – unlike acquired developmental skills of language & locomotion that humans are born equipped to do.

+ *****Premise

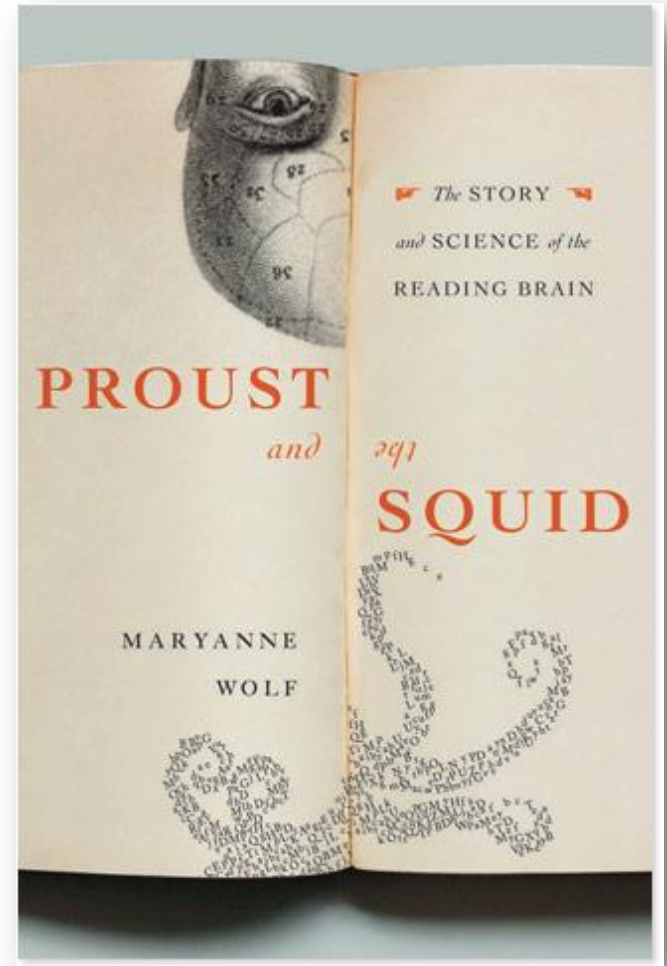


- To understand LD (disorders learning the 3 R's), we first need to understand how humans learn to read and deal with numbers...
- A necessary deviation (extra slides)



Essential reading if you really want to understand why many kids find it hard to learn to read!

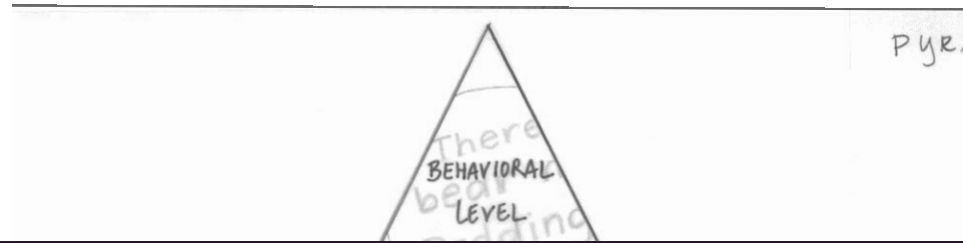
Proust and the Squid: The Story and Science of the Reading Brain



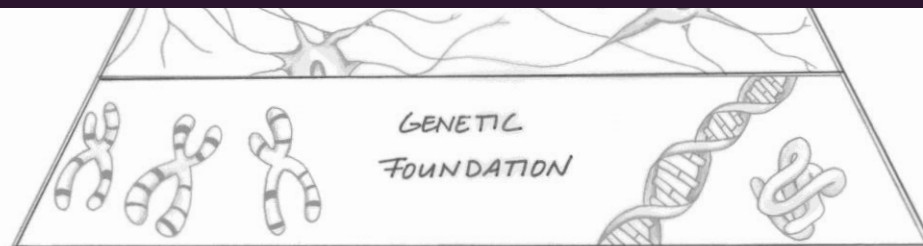
<http://itc.conversationsnetwork.org/shows/detail3405.html#>

+

“We were never born to read.”



Unlike language, reading has no specific genes to set up its circuitry or to dictate its development.



Pyramid of Reading Behaviours

+

- Existing circuits of neurons - originally designed for vision, language, & cognition - learned to forge whole new connections & pathways

- Neuroplasticity:

- Specialization:

- Automatization:



Principles of Brain Organization

Exploited in Cultural Invention of Reading

+ Dehaene's Concept:

“Neuronal Recycling” for Numeracy & Literacy

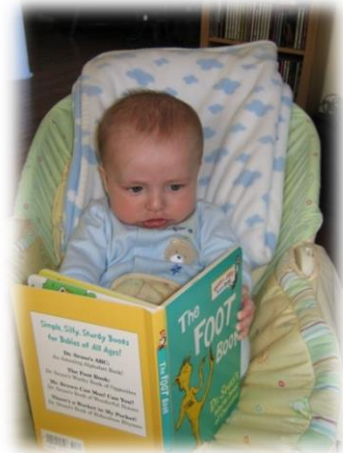
Neural circuits & pathways are created through *hundreds of exposures (or thousands in the case of dyslexia)* to letters, letter patterns, & words - to provide automatized & efficient processing of print



What are the implications for education?

+ It took the human species 2000 years of insights from first logographic scripts to first alphabet (system of symbols for **each sound**)

Children are given just 2000 days to gain the same insights!



No Genes specific to reading; no “Reading Center”

Each new reader must create a new reading circuit from older structures & their connections

Development of Reading

+ What must be bolted on...?

“ Children are wired for sound, but print is an optional accessory that must be painstakingly bolted on.” -

Steven Pinker

Automatic Recognition of:

- Smallest Sounds (Phonemes)
- Letters and Letter Patterns
- Word meanings
- Social conventions



+ How do we read single words?

- One key skill is **phonemic awareness**
- Phonemes are the building blocks of spoken language. They are represented by letters of the alphabet & are the component sounds of words (e.g., the word '---' is made up of 3 sounds: /c/ /a/ /t/).
- Reading requires the ability to map the letters in a word on a page with the sounds (phonemes) of one's language.
- If you cannot distinguish the sounds in a word, then it will be very difficult to map sounds with letters.



- Ability to identify & manipulate individual sounds in spoken words

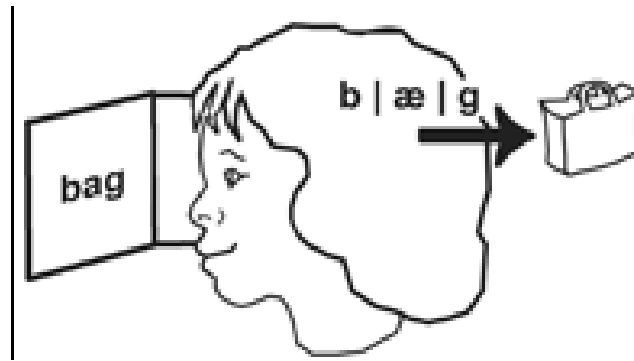
- How many phonemes are there in the word “.....”?

4 phonemes: the single letter ‘x’ is comprised of 2 sounds (phonemes: /k/ /s/)

What is phonemic awareness?



+ Learning the alphabetic principle matching letters to sounds (& understanding the word you have just decoded!)



- But English is tough!
- What letters do we use to represent the /f/ sound?
- “f” “ff” “gh” “ph”
- What sounds can the letters “ou’ make?
- Bough, cough, bought,

+ Teaching phonics isn't enough! English is a morphophonemic language!

- Changes in pronunciation undergone by allomorphs of morphemes as they are modified by neighboring sounds
- **Read aloud: *cats, dogs, boxes***
 - plural allomorphs *cat-s, dog-s, box-es*
- **Read aloud: *house, to house, housing***
- Allomorphs modified for grammatical reasons in the course of inflection or derivation,
 - *house* ['s' = /s/] versus *to house, housing* ['s' = /z/].



Morpheme: the smallest unit of meaning in a language
The word 'reddened' has 3 morphemes, which signal:
its root = *red*; its verb class = - *en*; past tense = - *ed*

How many morphemes in...
“reddened”

Morpheme: the smallest unit of
meaning in a language

What is a morpheme?



Volunteer needed to read a word!

Periventricular

nodular

heterotopia

What does this word mean?

Periventricular heterotopia is a condition in which nerve cells (neurons) do not migrate properly during the early development of the fetal brain (from about the 6th week to the 24th week of pregnancy) and form clumps around the ventricles. *Heterotopia* means "out of place."

Morphemes Matter



+SLD in Reading : Decoding Difficulties

- Poor Word Recognition: a.k.a. 'dyslexia'
- One of the most common manifestations of LD:
 - Unexpected difficulty in decoding single words ... slow & inaccurate
 - Difficulty learning letter-sound correspondence (esp. in English)
 - Poor phonemic awareness (esp. English)
- Leads to profound disturbance in decoding printed words that is typically associated with poor spelling
 - And sometimes poor written expression, learning math facts, and word-problems in math



+ Your language dictionary code to pronunciation of BLINGLISH

■ When you see Pronounce as

q d or t

z m

p b

b p

ys er

a (as in bat) e (as in pet)

e (as in pet) a (as in bat)

+ Read this passage aloud in Blinglish

STOP! Now what sound does the letter 'p' make?

Now remember the letter 'q' has 2 sounds: a /d/ or a /t/

what sound does the letter 'b' make?

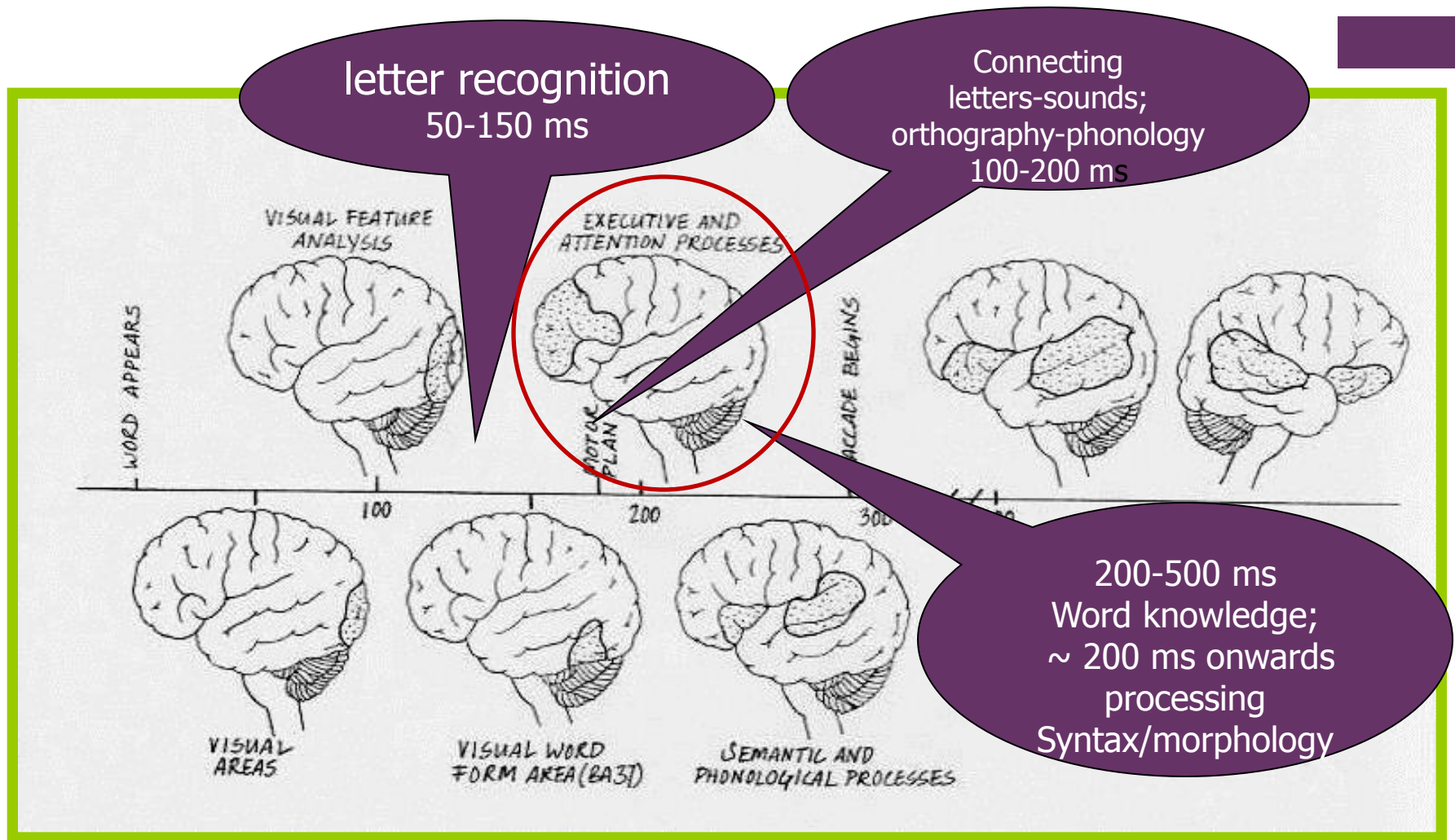
When you see	Pronounce as
q	d or t
z	m
p	b
b	p
ys	er
a (as in bat)	e (as in pet)
e (as in pet)	a (as in bat)

We pegin our qrib eq a faziliar blace, a poqy like yours enq zine. Iq conquains a hunqraq qrillion calls queq work qogaqhys py qasign. Enq wiqhin each one of qhese zany calls, each one qheq hes QNA, qhe QNA coqe is axecqly qhe saze, a zess-broquuceq rasuze.

+ And the translation ...



We begin our trip in a familiar place, a body like yours and mine. It contains a hundred trillion cells that work together by design. And within each one of these many cells, each one that has DNA, the DNA code is exactly the same, a mass-produced resume.



“Every word has 500 ms of fame” (P&S p.145)

Timeline of Fluent Reading: role of attention

from Maryanne Wolf: Proust & the Squid, 2007, p.145



Normal Readers

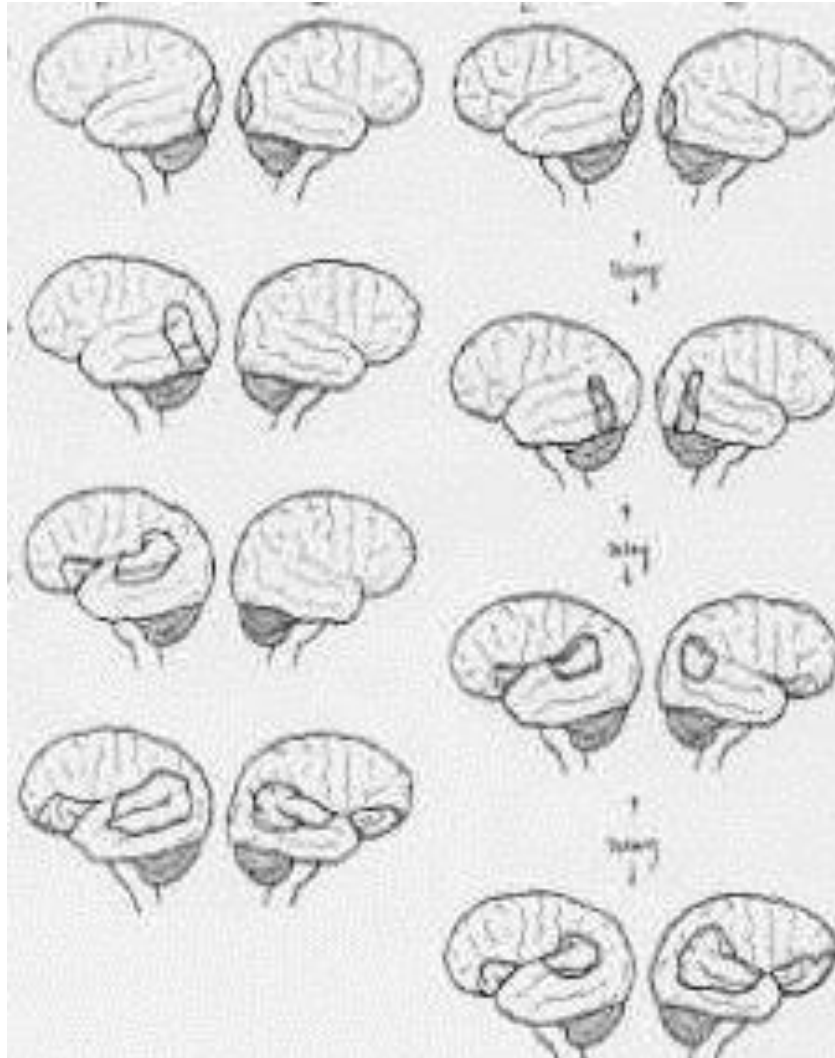
Disabled Readers

Visual Recognition
0-100 MSEC

Word Specific Activation
150 MSEC

Phonological Processing
180-300 MSEC

Semantic Processing
200-500 MSEC

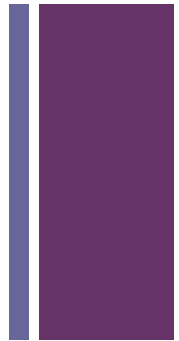


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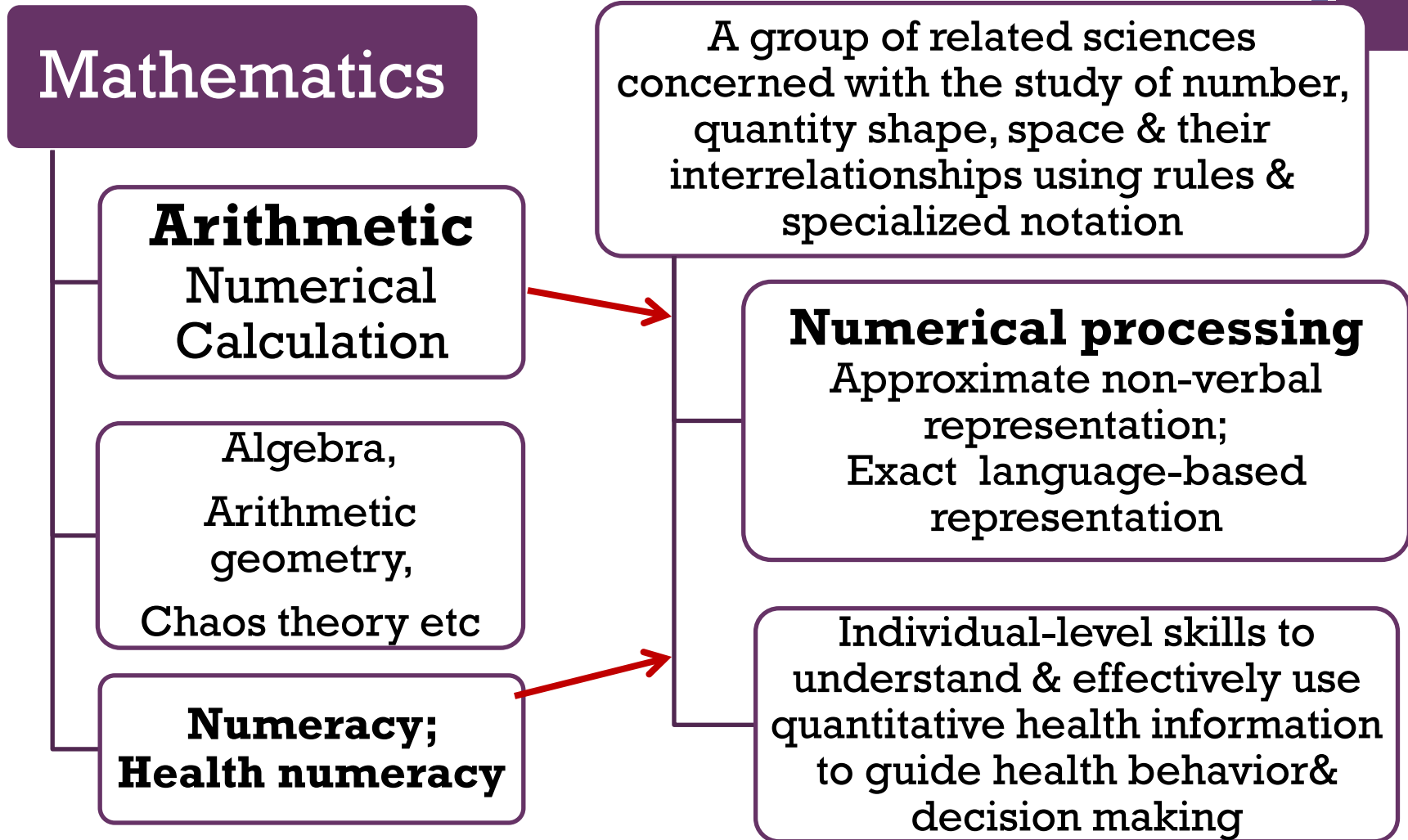
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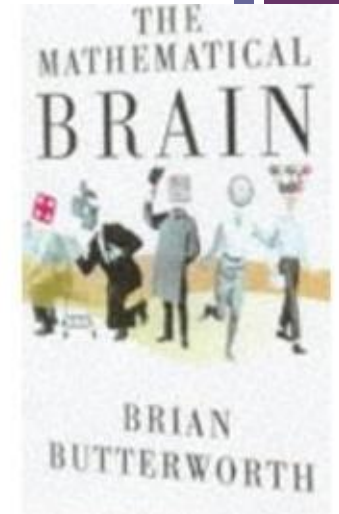
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+ Key concept-7: components of mathematics



Counting numbers



- How many numbers were there on the front page of the Globe and Mail today?
- How many numbers do you process in a day?
- Brian Butterworth (math researcher) estimates that he processes about 1,000 numbers an hour, about 16,000 numbers per waking day, nearly 6 million numbers per year!

+ Numbers count!

■ You buy tickets to a play and then you need to find your correct seat in the theatre

- a. 2 tickets
- b. Seats # 5 & 6
- c. Row 5

<p><u>1. Number:</u></p> <p>47</p>	<p><u>2. Number Word:</u></p> <p>forty seven</p>				
<p><u>3. Draw It:</u></p> <table border="1"><thead><tr><th>Tens</th><th>Ones</th></tr></thead><tbody><tr><td> </td><td>●●●●●</td></tr></tbody></table> <p>$\begin{array}{r} 4 \text{ Tens} + 7 \text{ Ones} = 47 \\ 7 \text{ Ones} + 4 \text{ Tens} = 47 \end{array}$</p>	Tens	Ones		●●●●●	<p><u>4. Expanded Form:</u></p> <p>$\begin{array}{r} 40 + 7 = 47 \\ 7 + 40 = 47 \end{array}$</p>
Tens	Ones				
	●●●●●				

■ What's different about these numbers?

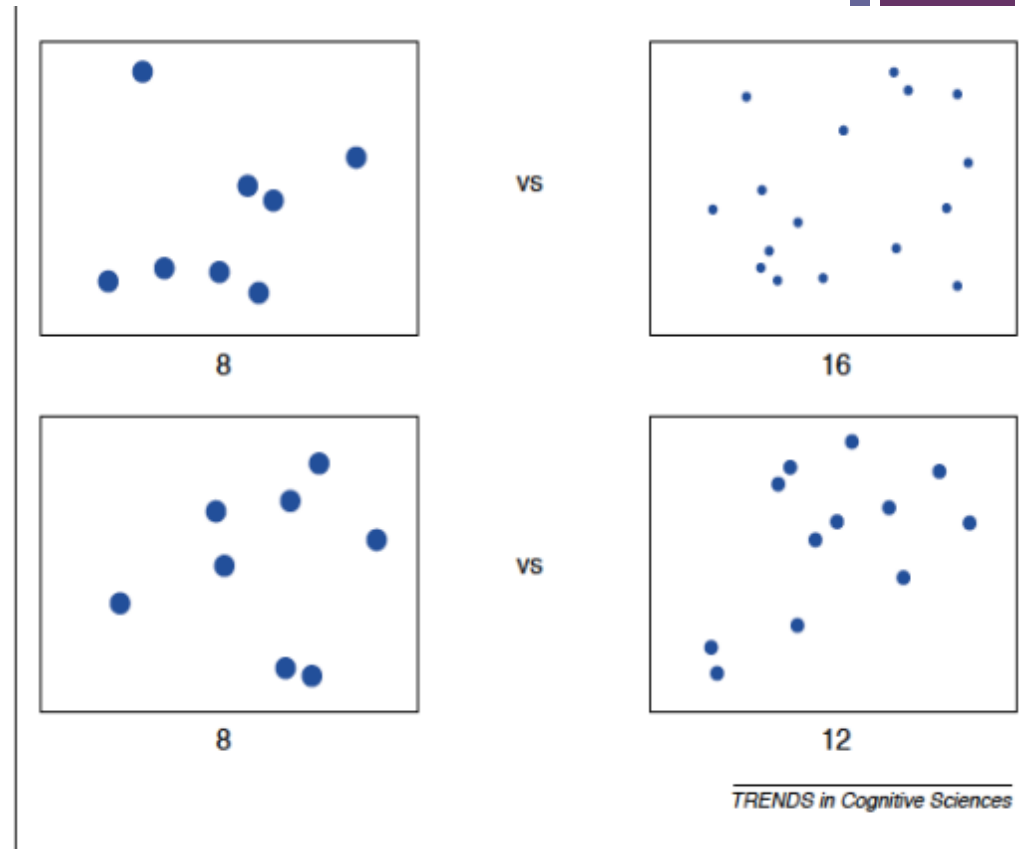
- a. Quantity or magnitude (core knowledge)
- b. Identity (name)
- c. Order or Rank (ordinal aspect of numbers)

+ Humans have 2 number systems

■ Numerical magnitude

- approximate numerical value of a collection of objects
- representations of space, continuous quantities such as length or time
- Developed in the course of evolution
- Evident in infants

■ Exact verbal code



Can estimate
using numerical
magnitude

Need to use
the exact
(verbal) code

+SLD in arithmetic (dyscalculia)

- Lack of 'number sense'
- Core deficit in processing numerosities/understanding quantity
 - Slow &/or inaccurate in simple numerosity tasks

The diagram is enclosed in a large rectangular border and is divided into two horizontal sections. The top section is titled "Object enumeration (e.g. how many dots?)". To the left of this title is a small dot above the text. To the right is a square box containing four black dots. The bottom section is titled "Numerosity comparison (e.g. which is more?)". To the left of this title is a small dot above the text. Below the title is a rectangular box containing the numbers "3" and "7". To the right of the title are two square boxes. The left box contains seven black dots, and the right box contains three black dots. Below the "3 7" box is the word "symbolic". Below the two dot boxes is the word "Non-symbolic".

- Less automatic processing of written numbers
- No sense of 'seven-ness'
- Problems linking written or spoken numbers to their quantity

+ Impact of reading problems on arithmetic development

- Phonological processing deficits impede aspects of math development that rely on the manipulation of verbal codes
 - Counting speed, Number fact recall
- Children & adults with reading problems, but with normal mathematics achievement, are less accurate & slower in single-digit arithmetic, particularly in multiplication
 - Verbal aspects of number & arithmetic depend on phonological representations in long-term memory
 - Simmons & Singleton (2008) *Dyslexia* 14:77-94; Boets & De Smedt (2010) *Dyslexia* 2008 16: 183-9; Gobel & Snowling (2010) *Q J Exp Psychol* 63:1361-73



Combined reading & arithmetic disabilities



- Reading and arithmetic disabilities occur more often than expected by chance
 - but in the presence of reading problems, arithmetic problems may be primarily related to the verbal code
 - Dirks et al (2008) J Learn Disabil 41: 460-73

End of extra slides

DSM-5 changes in SLD criteria

4 criteria

- A. Key characteristics of the disorder
- B. Measurement of the key characteristics
- C. Age at onset of symptoms
- D. Exclusionary criteria

+ Symptoms of SLD are listed; duration specified; reference to intervention:

- **Criterion A** (*KEY CHARACTERISTICS*):
- Difficulties learning & using academic skills, as indicated by the presence of:
 - at least one of the following symptoms...
 - that have persisted for at least 6 months..
 - despite the provision of intervention that targets those difficulties:

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List of clinical symptoms (criterion A)

1. *Inaccurate or slow and effortful word reading*
(e.g., reads single words aloud incorrectly or slowly and hesitantly, frequently guesses words, difficulties sounding out words)
2. *Difficulty understanding the meaning of what is read*
(e.g., may read text accurately but not understand the sequence, relationships, inferences, or deeper meanings of what is read)
3. *Difficulties with spelling*
(e.g., may add, omit, or substitute vowels or consonants)
4. *Difficulties with written expression*
(e.g., makes multiple grammatical or punctuation errors within sentences; employs poor paragraph organization; written expression of ideas lacks clarity).
5. *Difficulties mastering number sense, number facts or calculation*
(e.g., poor understanding of numbers, their magnitude, and relationships; counts on fingers to add single-digit numbers instead of recalling the math fact like peers; gets lost in the midst of arithmetic computation and may switch procedures)
6. *Difficulties with mathematical reasoning*
(e.g., severe difficulty applying mathematical concepts, facts, or procedures to solve quantitative problems)

+ DSM-5 SLD : Criterion B (*MEASUREMENT*)

- The affected academic skills are substantially and quantifiably below those expected for the individual's chronological age, and cause significant interference with academic or occupational performance, or with activities of daily living, as confirmed by individually administered standardized achievement measures and comprehensive clinical assessment.
- For individuals aged 17 and older, a documented history of impairing learning difficulties may be substituted for the standardized assessment.

+ DSM-5 SLD : Criterion B (*MEASUREMENT*)

Continued

- Guideline: academic achievement score(s) at least 1.5 SD below mean for age ($SS \leq 78$, or $< 5^{\text{th}}$ %ile)
- BUT use clinical judgment/assessment skills & experience in educational system for use of more lenient cut-off
 - e.g., scores 1 SD to 1.5 SD below mean)
 - e.g., about average performance but requires extraordinary effort; history of LD; school records, many scores ~ 1 SD below age
- Based on individually administered, culturally appropriate, & psychometrically sound norm-referenced measure of academic achievement

+ Key issues related to 'measurement' of the academic skills

- The IQ-achievement discrepancy criterion is no longer used in DSM-5 as a criterion for diagnosing (or identifying an SLD exceptionality) because it is invalid
- DSM-5 does not prohibit the use of IQ assessment – but rather that the IQ score is not to be used to estimate IQ-achievement discrepancy
- Thus, if you believe that the information from an IQ test yields useful information for program planning, then include it

DSM-5 SLD: Criterion C (AGE AT ONSET)

- The learning difficulties begin during school-age years but may not become fully manifest until the demands for those affected academic skills exceed the individual's limited capacities (e.g., as in timed tests, reading or writing lengthy complex reports for a tight deadline, excessively heavy academic loads).

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DSM-5 SLD: Criterion D

(EXCLUSIONARY CONDITIONS)

- The learning difficulties are not better accounted for by:
 - Intellectual Disabilities, Global Developmental Delay,
 - Uncorrected vision or hearing loss,
 - Other mental disorders,
 - Psychosocial factors,
 - Lack of proficiency in the language of instruction,
 - Inadequate educational opportunities.

Intellectual disability as defined by DSM-5, typically indicated by an IQ score $< 70 (\pm 5)$ plus age/socio-culturally inappropriate adaptive behavior

+ Specifiers for SLD

- Descriptive Features
- Severity

+ Single category of SLD with Specifiers

- Specify all academic domains and subskills that are impaired at the time of assessment, from the following:
- With impairment in reading:¹
 - *Word reading accuracy*
 - *Reading rate or fluency*
 - *Reading comprehension*
- With impairment in written expression:
 - *Spelling accuracy*
 - *Grammar and punctuation accuracy*
 - *Clarity or organization of written expression*
- With impairment in mathematics:²
 - *Number sense*
 - *Memorization of arithmetic facts*
 - *Accurate or fluent calculation*
 - *Accurate math reasoning*

+ Severity rating for SLD

- Mild, Moderate, Severe
- Based on the range of academic skills affected PLUS the anticipated ability to compensate or need for accommodations or other supportive services

Specify Current Severity of SLD

- **Mild:** Some difficulties learning skills in one or two academic domains, but may be able to learn those skills with accommodations provided with appropriate accommodations, especially during the school years. Some accommodations may be needed to complete activities accurately and efficiently.
- **Moderate:** Moderate difficulties learning skills in one or two academic domains, so that the individual may not be able to learn those skills without some interventions during the school years. Some accommodations may be needed to complete activities accurately and efficiently.
- **Severe:** Learning difficulties affecting several academic domains are so severe that the individual is unlikely to learn those skills without ongoing intensive individualized and specialized teaching for most of the school years. Even with an array of appropriate accommodations or services at home, school, or workplace, the individual may not be able to complete all activities efficiently.


CAUTION:
disorder-specific severity ratings were required by APA/DSM-5 but these have not been evaluated or validated

+ Applying the Severity Level in Educational Context

- DSM-5 designed the severity rating to be applied at the level of the ‘disorder’ (i.e., to the category of Exceptionality of SLD)
- BUT, this does not preclude a determination of the student’s level of functioning at both the ‘Domain’ level & the ‘Sub-Domain’ level
- To sum up: observe severity at the SLD level, the academic domain level, and the sub-domain (sub-skill) level.

+ Quiz #3 [discuss in small groups)

1. What do you think is the major change to the criteria for SLD and why?
2. What criteria replace the IQ-achievement discrepancy criterion?
3. What Specifiers are to be used when identifying/diagnosing SLD?



+ Why were these changes
made to SLD?

What evidence supported these changes?

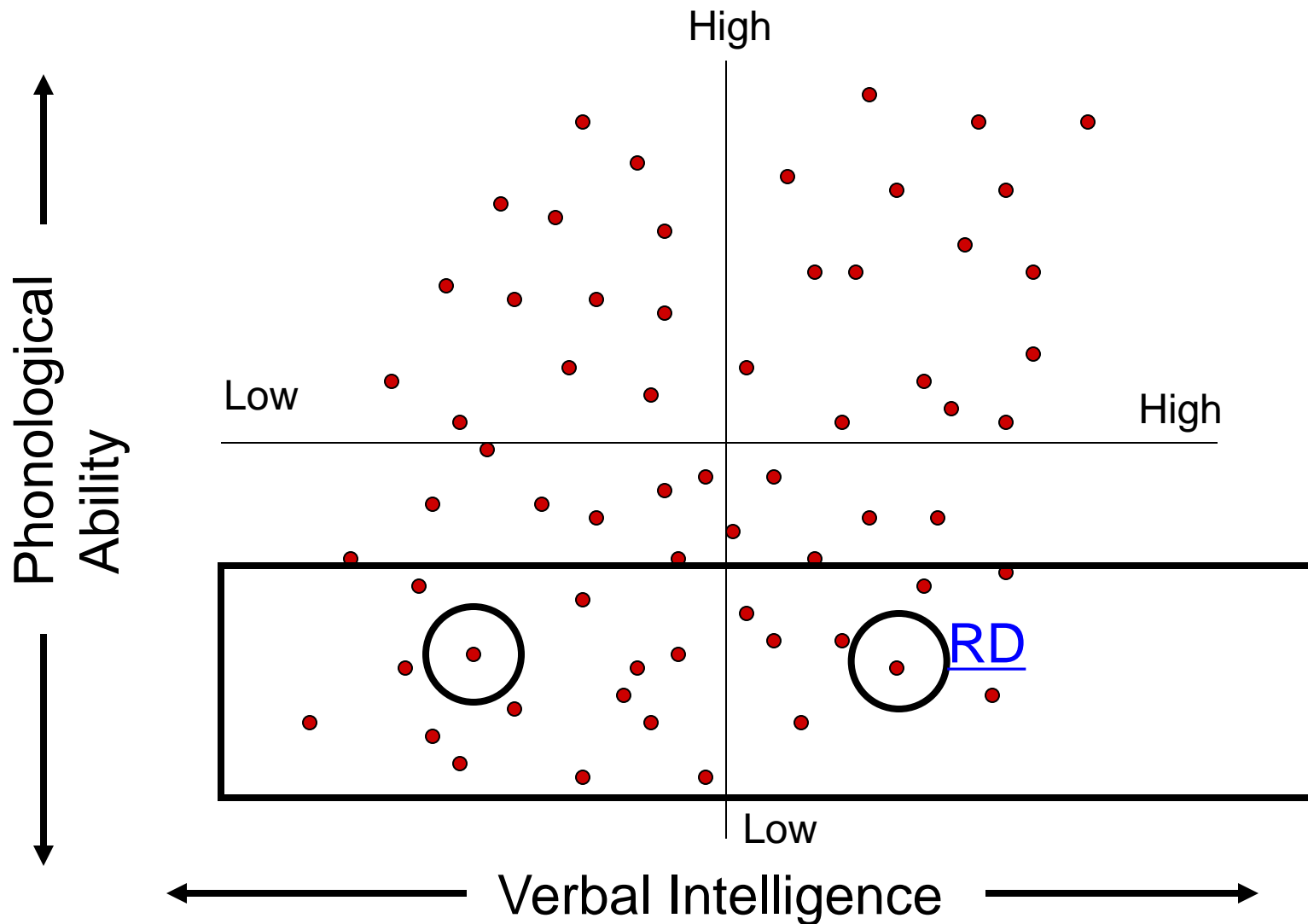
+ 1: WHY was the IQ-achievement discrepancy criterion eliminated?

- The logic behind the IQ-discrepancy definition is that the cause of the learning difficulties would differ between those with & without IQ-Achievement discrepancy.
- **Do individuals with learning difficulties with & without an IQ-achievement discrepancy differ in clinically meaningful ways?**
 - **i.e., in antecedent, concurrent, predictive validators?**

IQ-achievement discrepancy criterion is not valid

- Poor readers of at least average intelligence (e.g., $IQ \geq 70 \pm 5$) with & without an IQ-achievement discrepancy do not differ reliably in clinically or educationally meaningful ways:
- ***Antecedent Validators:***
 - Familial aggregation of spelling problems (Schulte-Korne et al., 1996)
- ***Concurrent Validators***
 - Cognitive processing skills that contribute to learning:
 - Meta-analysis & Empirical studies: Fletcher et al., 2005; Francis et al., 2005; Maehler & Schuchardt, 2009; Siegel, 1992; Stanovich & Siegel, 2000; Schuchardt et al., 2011; Stuebing 2002
 - Biological brain basis
 - Tanaka et al (2011) Genetics; Skiba et al, (2011) candidate genes
- ***Predictive Validators***
 - Long-term prognosis: Francis et al., 1996; Share, McGee, & Silva, 1989
 - Response to intervention: Hatcher & Hulme, 1999; Vellutino et al., 2000, 2006, 2008; meta-analysis by Stuebing et al., 2009.

Phonological Language Ability is not highly Correlated with General Verbal Ability as measured by IQ tests



A Meaningless Distinction (Figure 2)

Some children with reading disabilities exhibit severe discrepancies between their IQs and achievement. Others with reading disabilities show no discrepancy; their poor reading skills correspond to low IQs. Yet their subsequent growth in reading skill is virtually identical.



The Connecticut Longitudinal Study traced three groups of children: 1) skilled readers; 2) children labeled "reading disabled" due to a discrepancy between their IQs and reading ability; and 3) those so defined due to low achievement. The data show that the reading skills of children with reading disabilities, discrepant or not, grow at the same rate and never match those of skilled peers.

+ Validity of IQ-achievement discrepancy *Predictive validators*

■ *Treatment Response*

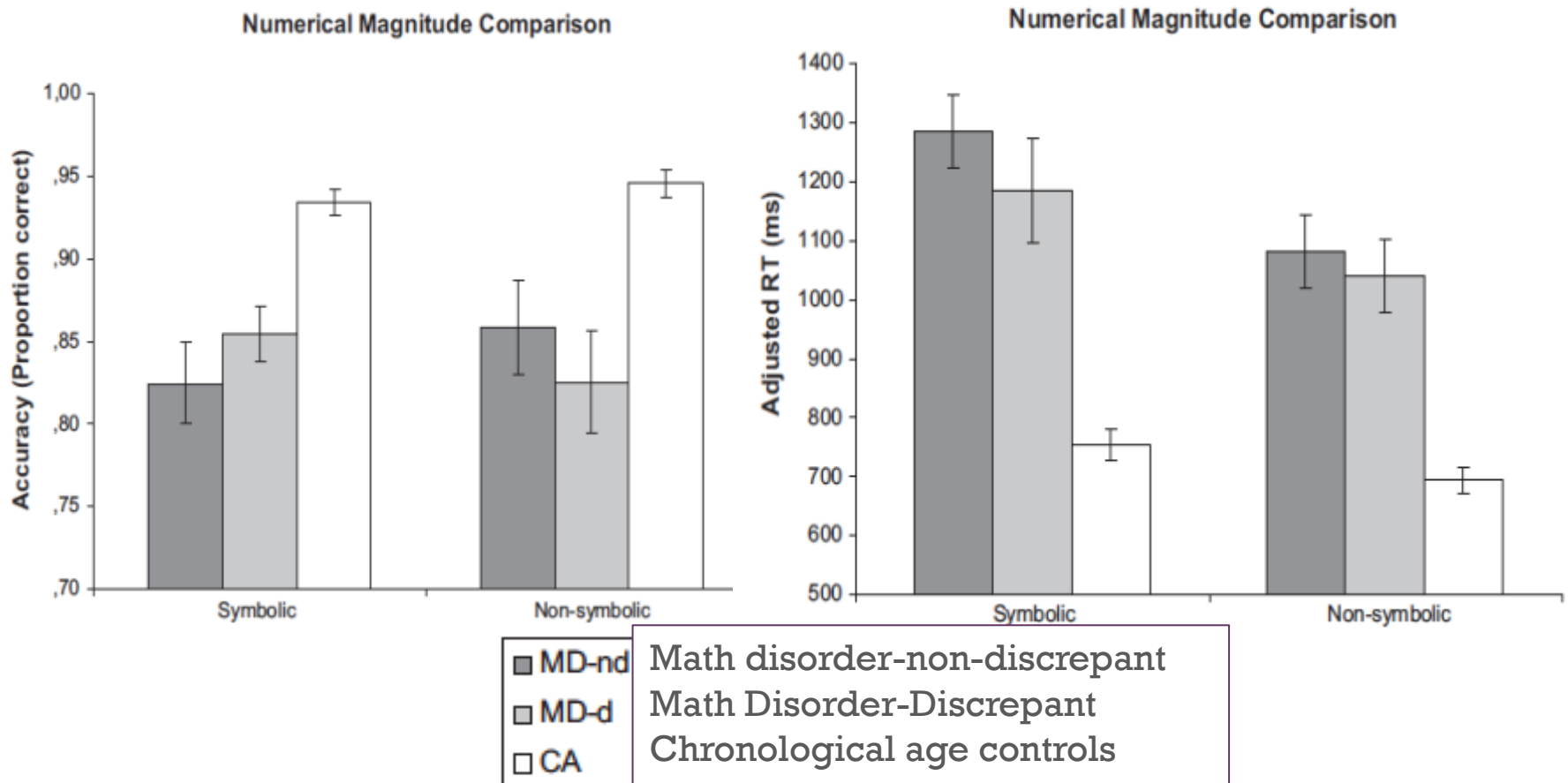
- Meta-analysis, as well as a score-card review of 10 studies & a large-scale study
- IQ accounts for only a small amount of the variance (1%) in response to reading intervention
- Further evidence against the reliance on an IQ-achievement discrepancy definition of LD

(Stuebing et al, 2009; Vellutino et al, 2000)

+

**No difference in numerical processing deficits in children with SLD in Arithmetic with & without IQ-achievement discrepancy

(Brankaer et al (2014) *Res Develop Disabilities*, 35: 2603-2613)





A rating scale for Inattention

(scored 0 – 2: max score for inattention = 8)

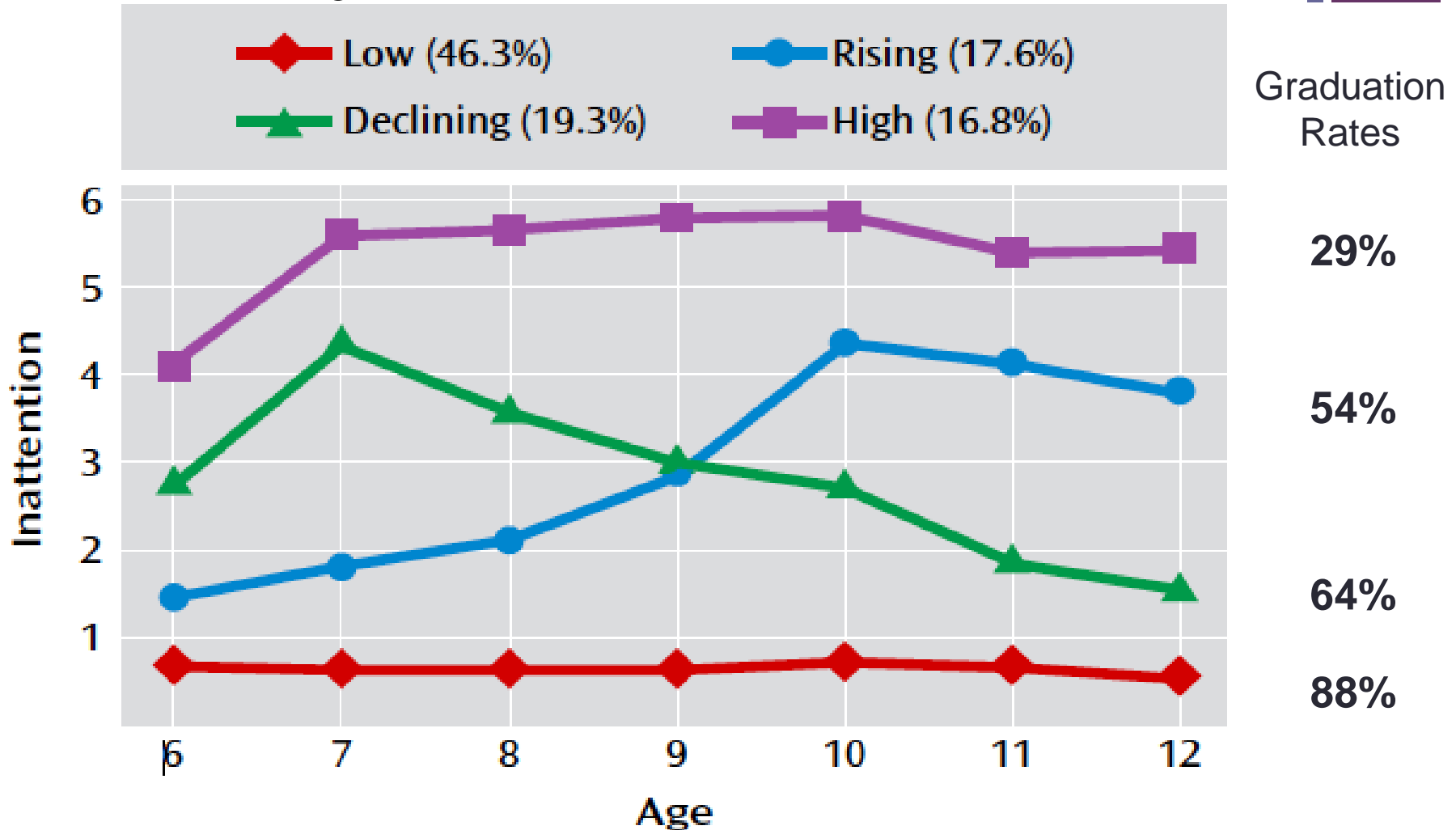
1. Weak capacity for concentration, cannot maintain his or her attention for a long time on the same task
2. Easily distracted
3. Absentmindedness
4. Gives up easily

Large-scale Canadian Study: Teachers used this scale to rate 2000 children each year, from K - grade 6

- randomly selected from a total of 3715 children with parental consent
- Pingault et al, *Am J Psychiatry* 2011

✦ Persistent classroom inattention is a strong predictor of NOT obtaining a high-school diploma at age 22-23

Pingault et al 2011; data from Quebec, Canada



+ What other approaches were considered for defining SLD?

- At least average IQ ✓
 - to differentiate SLD from general learning difficulties associated with intellectual disability
- Cognitive processing deficits ✗
- Response to intervention ✗
- Persistence of learning difficulties ✓

+ 2. Rationale for excluding psychological processes in diagnostic criteria

- *Scientific:*

- Evidence that psychological processes associated with RD –the most common & well-documented LD – are probabilistic, varied, & unreliable – lack awareness for diagnosis of dyslexic individuals (Pennington et al 2001)
- Psychological processes associated with written expression remain unclear & vary culturally

- *Clinical utility:*

- If included, diagnosis must await full & costly psychological/neuropsychological assessment; may result in inequitable access to such assessment

Assessment of psychological processes is not required for diagnosis, but might be useful for guiding program planning

+ Cognitive processing deficits?

- Association between cognitive processing deficits & Reading Disorder is probabilistic, not deterministic
- This means that a clinician cannot use a specific cognitive profile to rule in/out a diagnosis of SLD in Reading

21% of youngsters with clinically confirmed diagnosis of SLD in Reading would be missed if clinicians required evidence of deficits on at least 1 of these cognitive processes

Dyslexic Cases in CLDRC: Cross-Tabulation of Overall Model Fit, Based on Best-Fitting Model and Best-Fitting Methods Applied to Individual Cases

	Deficit	PA only	L only	PS/NS only	PA and L		Total		
Best-fitting model	PA	11	0	0	1		30		
	L	0	5	0	1		10		
	PS/NS	0	0	4	0		13		
	Multiple	3	3	1	2	5	30		
	Total	14	8	5	4	13	6	15	18

Note. CLDRC = Colorado Learning Disabilities Research Center; PA = phoneme awareness; L = language skill; PS = processing speed; NS = naming speed.

+ 3. WHY were LD subtypes eliminated?

DSM Requires evidence that subtypes are:

■ **Mutually exclusive**

- distinct from one another

■ **Exhaustive**

- capture the range of manifestation

■ **Developmentally sensitive**

- capture the developmental changes in manifestation of the disorder

+ Evidence against validity of LD subtypes: *Antecedent Validators*

- **Family aggregation.** Twin studies find *purportedly distinct LDs have a common genetic etiology*
(Hart et al, 2009; Haworth et al., 2009; Kovas et al, 2007; Willcutt et al, 2010)
- **Environmental risk factors.** Meta-analyses, large-scale prospective studies, & systematic reviews, find that *prematurity/very low birth weight & prenatal exposure to nicotine increase the risk for LD across all academic domains in childhood*
(Aarnoudse-Moens et al, 2009; Anderko et al, 2010; Batstra et al, 2003; Johnson et al 2011; McGowan et al, 2011; O'Callaghan et al, 2010; Yolton et al, 2005)
- **Prior psychiatric history.** A developmental history of *Communication Disorders in preschool years is a common precursor of all three LD subtypes*
(Anthony et al, 2011; Jordan et al, 2010; Lewis et al, 2011)

+ Evidence against validity of LD subtypes: *Concurrent Validators*

- **Comorbidity**: High rates of comorbidity amongst the various categories of LD across the lifespan & across divergent cultural/linguistic groups challenge their discreteness (Hart et al., 2009; Katusic et al., 2009; Kovas et al., 2007).
- **Academic impairments**: those associated with each one of the DSM-IV-TR LDs extend far beyond those expected (*Boets & DeSmedt 2010; Gobel & Snowling, 2010; Pimperton & Nation, 2010; Raghubar et al., 2009*)
- **Cognitive processes**: Twin studies of LD in Mathematics or Reading, suggest that the cognitive profiles of these disorders differ only in subtle ways, mainly in terms of severity
 - *Comorbidity may be due to a common genetic risk factor leading to slow processing speed (Willcutt et al., 2010) or impaired statistical learning (Arciuli & Simpson, 2012)*

+ Evidence against validity of LD subtypes (cont...): *Predictive Validators*

• Diagnostic Stability

- longitudinal studies provide strong evidence of a developmental accumulation of learning difficulties with increasing cognitive demands of the curriculum (not discrete or distinct separate LDs).
- *Speech sound disorders in early childhood: manifest as difficulties learning to read, spell, and write in the school years (Lewis et al, 2011);*
- *over 50% of children with phonologically-based reading difficulties but no apparent difficulties in learning basic arithmetic at age 5, have learning difficulties in mathematics & continued problems in reading at age 7 (Jordan et al, 2010)*

+ **BUT...There is also evidence for validity of LD subtypes**

- **Isolated, domain-specific deficits**

- deficits can occur in just one academic domain (e.g., in written language but not in reading; in math but not in reading);
- or even in one academic skill within one academic domain (word decoding but not comprehension)

(Barbarese et al, 2006; Davis et al., 2010; Katusic et al al, 2009; Snowling & Hulme, 2011).

- **Response to Intervention**

- Different manifestations of LD require and respond to different interventions; little evidence of generalizability to other domains

(Lovett et al, 2000; Morris et al, 2010; Wilson et al, 2006)

+ Hence, one overarching category: SLD

- ◆ Eliminate DSM-IV subtypes of LD
- ◆ One overarching category of SLD
- ◆ Specifiers for current manifestation
 - *specifiers include & extend DSM-IV disorders****

***Clinicians may opt to use the terms ‘**dyscalculia**’ & ‘**dyslexia**’ if preferred, but are strongly encouraged to check all areas that are impaired

+ 3. Why was the IQ-achievement discrepancy criterion replaced with 4 new criteria?

- Reliance on low achievement (LA) as sole criterion results in high rate of false positives?
- Children may struggle to achieve academically for many reasons - not just due to dyslexia or LD

+ ‘despite the provision of intervention that targets those difficulties’

- This does not refer to the systematic tiered levels of instruction as formalized in the USA-based RTI models
- ‘Intervention’ refers to classroom instruction that is designed to address the student’s learning difficulty
 - e.g., For students with reading comprehension difficulties in the presence of good decoding skills, there needs to be evidence from the school or from a tutor that instruction focused on reading comprehension and not phonological processing or math.

+ Why specify duration of symptoms?

- to reduce premature diagnosis
- to indicate persisting difficulties learning
- clinical utility -duration of 6 months often used for other DSM-5 disorders
- In Europe, 2 yrs duration often used for diagnosis of 'SLD in mathematics (dyscalculia)' but this duration is considered too long for diagnosis of 'SLD' so DSM-5 chose a 6-month duration

+ Quiz #4 [discuss in small group]

1. Why are Subtypes of SLD no longer differentiated?
2. Why was the IQ-achievement criteria eliminated?
3. Why is a low achievement score insufficient to identify/diagnosis SLD?
4. What does DSM-5 mean by the the phrase in Criterion A:
“...despite the provision of intervention that targets those difficulties”?



Practice Points

+ Key issues: Gifted LD

key data sources to diagnose LD would be:

- history of learning difficulties
- Family history of LD
- School reports -evidence of struggle /extraordinary effort to maintain performance
- Scores on standardized academic achievement tests (which may indeed indicate scores well below average, especially on fluency measures; need to consider written expression as well as reading, math etc)
- Clinical interview/educational history to ascertain the types of learning/performance struggles
- *academic achievement scores considered relative to same-age peers, not to IQ or self-achievement in other academic domain; **but need to integrate & synthesize information from multiple sources (as listed above)***

+ **Specific & Unexpected learning difficulties

- Not part of more general learning difficulties as manifest in Cognitive Disorder (ID): difficulties manifest in academic skills that must be taught/learned, not in walking, talking, self-care or more general life skills
- The difficulties can be circumscribed (restricted to one or a few academic skills), although it is more common to observe difficulties manifest over time in all 3 major domains (reading, writing, arithmetic)
- Learning difficulties cannot be attributed to
 - external factors, such as economic or environmental disadvantage, lack of access to education as typically provided on the person's cultural context
 - Internal factors (e.g., neurological, motor disorders, uncorrected vision or hearing acuity)



****Low academic achievement**

- Academic achievement scores in reading, spelling, arithmetic, written expression may vary as a result of the technical properties of the specific test being used, the testing conditions, & other variables.
- Thus, identification/diagnosis should not be based solely on low academic achievement on one test- need comprehensive assessment that includes academic history, school reports, school work, and other test scores

+ ****Guidelines for 'cut-point' in academic achievement scores**

- Academic skills are distributed along a continuum, so there is no natural cut-point to differentiate atypical from typical scores: thus any cut-point is rather arbitrary
- However, achievement scores approximately 1.5 SD below the mean for age (< 7th percentile) afford greatest diagnostic certainty. A more lenient cut-off (e.g., 1.0 to 1.5 SD below mean for age) may be used, based on clinical judgment when indicated by converging evidence of SLD accrued from comprehensive assessment

+ ****Differentiating SLD from Cognitive Disorder (ID) & other problems**

- Caution required in the assessment of individuals with
 - 'borderline IQ & low adaptive functioning' ,
 - communication problems,
 - sensory or motor impairments
 - Severe behavioral problems
 - Immigrants
 - low literacy level
 - Mental health disorders
 - Pharmacological treatment or other medical treatment (radiation, chemotherapy)
 - Severe social or sensory deprivation
- Greater reliance on comprehensive assessment and clinical skills & experience for interpreting test scores

+ Key issues: When do we need to measure intellectual functioning?

- When there is concern or suspicion that the youngsters may have an intellectual Disability, but keep in mind...
 - IQ estimates are unreliable for under 5-year-olds
 - IQ estimates may be invalid in the following contexts: – severe behavioral, sensory, physical impairments; psychosocial deprivation or abuse; war-trauma; lack of proficiency in language of instruction/testing
- To help confirm the diagnosis of Intellectual Disability, along with assessment of adaptive functioning, and evidence of onset in the developmental period
- When there is suspicion that the youngster may be intellectually gifted

+ Key issues: How can we differentiate SLD from ID?

- The real issue is with those youngsters who fall in the 'grey zone' of intellectual ability (IQ ~ 70) who manifest low levels of academic achievement – do they have SLD?
- ID is conceptualized as a disorder of reasoning and judgment etc not as 'low IQ' or a severe learning disorder
 - Need to consider adaptive functioning (e.g., inability to recognize & avoid risk –physical or social; risk of being manipulated by others; deficient judgment)

+ Questions, concerns, comments?



+ DSM-5 Workgroup on Neurodevelopmental Disorders: LD Subcommittee & Advisors

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