ADHD & Specific Learning Disabilities in DSM-5

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

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Plan for this session

• Synopsis of DSM process

• ADHD: Major concerns about DSM-IV criteria & recommendations for DSM-5

• LD: Major concerns about DSM-IV criteria & recommendations for DSM-5

• Open up for general discussion:
DSM5 Organizational Structure

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

Task Force Members: 13 Work-group chairs & experts

Study Groups = 6

Dx Spectra
Gender & culture
Impairment Assessment
Diagnostic assessment instrument
Lifespan & Development
Psychiatric & general medical

Work Groups = 13

Neurodevelopmental Disorders
ADHD & Disruptive Behavior Disorders
DSM abandons the romans!
DSM Process: a balancing act

Diagnostic criteria are behavioral descriptors: potential etiologic factors are summarized in the text.
General Problems with DSM

- DSM – based on clusters of signs & symptoms
- Poor validity – a system devised for reliability
- Heterogeneity of DSM disorders (polythetic criteria sets)
- Excessive comorbidity
- Reification of disorders
- Too many ‘disorders’!
## DSM-5 Metastructure aligned with ICD-11

<table>
<thead>
<tr>
<th>Code</th>
<th>Disorder</th>
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<tbody>
<tr>
<td>F-0</td>
<td>Neurodevelopmental Disorders</td>
</tr>
<tr>
<td>F-1</td>
<td>Schizophrenia Spectrum &amp; Psychotic Disorders</td>
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<tr>
<td>F-2</td>
<td>Mood Disorders</td>
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<tr>
<td>F-3</td>
<td>Anxiety &amp; Stress-Related Disorders</td>
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<tr>
<td>F-4</td>
<td>OCD, Tic, Stereotypic Behavior Disorders</td>
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<tr>
<td>F-5</td>
<td>Somatic Disorders</td>
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<tr>
<td>F-6</td>
<td><strong>Antisocial &amp; Impulse-Control Disorders</strong></td>
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<tr>
<td>F-7</td>
<td>Substance-Related, Gambling &amp; Related Disorders</td>
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<tr>
<td>F-8</td>
<td>Neurocognitive Disorders</td>
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<tr>
<td>F-9</td>
<td>Other Disorders</td>
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</tbody>
</table>
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
Require detailed documentation of scientific evidence to support recommended changes (explanatory text plus tabulated & rated studies submitted to Scientific Review Committee & Public Health Committee for approval)

• **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
DSM5 Field Trials

• Designed specifically to test:
  1. Clinical utility, feasibility, reliability of selected *DSM-5 draft diagnostic criteria*

  2. Clinical utility, feasibility, reliability & sensitivity to change of the *cross-cutting and diagnostic-specific severity measures*

Large Academic settings  Routine Clinical Practice settings
DSM-IV-TR Diagnostic Criteria for ADHD

• Classification in DSM-IV meta-structure
  • *Disorder first diagnosed in Infancy, Childhood, or Adolescence*

• ADHD factor structure
  • 2 dimensions (inattention, hyperactivity/impulsivity)
  • 3 purported subtypes

• ADHD Diagnostic criteria
  A. Symptoms: ≥ 6 Inattentive or ≥ 6 hyperactive/impulsive
    • Persisted ≥ 6 months, maladaptive, developmentally inconsistent
  B. Some symptoms causing impairment present before age 7
  C. Impairment from symptoms present in 2 or more settings
  D. Clinically significant impairment in social, academic, or work
  E. Exclusionary disorders: PDD, Autism, Schizophrenia, etc
ADHD in the DSM-5 Metastructure

F-0  Neurodevelopmental Disorders

- Intellectual Disability
- Autistic Spectrum Disorder
- Communication Disorders
- Developmental Motor Co-ordination Disorder
- **ADHD**
- Specific Learning Disorders

F-6  Antisocial & Impulse Control Disorders

- Antisocial Disorders (eg CD)
- Impulse Control & Disruptive Disorders (e.g. ODD, Pyromania, IED)

**ADHD** is separated conceptually from ODD, CD for the first time in DSM
Current weaknesses in DSM-IV-TR
ADHD identified by the Work Group

1. Lack of scientific basis for age-at-onset criterion
2. Questionable validity of subtypes
3. Developmental insensitivity of symptoms & thresholds for adults, including inadequate coverage of impulsiveness
4. Presence of autism/PDD as diagnostic exclusion
1. What is the validity of Criterion B?

“Age-at-Onset of ADHD symptoms”

• Criterion B: Some hyperactive/impulsive or inattentive symptoms that caused impairment were present before age 7 years. (Introduced in DSM-III)

• Approach: systematic literature search
  – 31 studies reporting original data on age of onset
1. DSM5 Workgroup Recommendations for Criterion B

- In the absence of a scientific basis for the existing age of onset criterion, modify the current age-at-onset (age 7) to age 12 years of age.

- What are the implications of changing Criterion B?
  - Polanczyk (2010) concluded that raising the age of onset to age 12 would not increase prevalence rates of the disorder.
    
    \[(J \text{ Am Acad Child Adolesc Psychiatry} \ 49: 210)\]
2. DSM-IV ADHD Subtypes

- DSM-III
  - Inattention
  - Hyperactivity
  - Impulsivity

- DSM-III-R
  - All ADHD symptoms

- DSM-IV
  - Inattention
  - Hyperactivity/Impulsivity

- DSM-5?
Validity of *DSM-IV* Attention Deficit/Hyperactivity Disorder Symptom Dimensions and Subtypes

Willcutt, Nigg, Pennington, Solanto, Rohde, Tannock, Loo, Carlson, McBurnett, Lahey (2012)
Journal of Abnormal Psychology. 121(4):991-1010

Conclusions from a comprehensive literature review and meta-analysis of 431 studies...

“Overall, we conclude that the DSM-IV ADHD subtypes provide a convenient clinical shorthand to describe the functional and behavioral correlates of current levels of inattention and hyperactivity/impulsivity symptoms, but do not identify discrete subgroups with sufficient long-term stability to justify the classification of distinct forms of the disorder.”
2. Proposed changes for DSM-5 ADHD: Specifiers (but no subtypes)

- **Course specifier of current presentation**
  - Hyperactive/Impulsive presentation ($\geq 6 \text{ hyp/imp but } \leq 5 \text{ inatt}$)
  - Inattentive presentation ($\geq 6 \text{ inatt but } \leq 5 \text{ hyp/imp}$)
  - Combined presentation ($\geq 6 \text{ inatt and } \geq 6 \text{ hyp/imp}$)
  - Partial Remission ($\leq 6 \text{ inatt, } \leq 6 \text{ hyp-imp, but had diagnosis in the past & remains impaired}$)

- **Severity Specifier**
  - Mild, moderate, severe
3. Developmental insensitivity of symptoms & threshold

Suggestions for improving assessment of ADHD in older adolescents & adults include:

a. Elaborate examples of current criteria ✔

b. Add/substitute 4 impulsivity items ✗

c. Lower diagnostic threshold for adults from 6 to 5 symptoms (inattention, hyperactivity/impulsivity) ✔
Summary of changes to ADHD approved by the APA Scientific Committee & Board

- Change age-at-onset to age 12 yrs
- Eliminate subtypes but include specifiers of current presentation
- Keep the same stems of the current 18 symptoms
  - elaborate examples of symptom manifestation relevant for adults as well as children
- Symptom threshold for individuals age 17 yrs and older will be reduced to 5 symptoms of inattention or hyperactivity/impulsivity.
- Autism, etc not longer is an exclusionary criterion
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
Question #1: To Split or Lump SLDs?
Evidence required for subtypes

- **Mutually exclusive**
  - distinct from one another
- **Exhaustive**
  - capture the range of LDs
- **Developmentally sensitive**
  - capture the developmental changes in manifestation of the disorder
Evidence for splitting or lumping SLDs

**Antecedent Validators-1**

- *Family aggregation*. Twin studies consistently find significant genetic & shared environmental overlap amongst reading, mathematics, & written expression disorders:
  - Suggests that *these 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

Prior psychiatric history. A developmental history of Communication Disorders (Speech Sound Disorder, Specific Language Impairments, alone or in combination) in preschool years is a common precursor of all three LD categories listed in DSM-IV, but particularly for:

- poor skills in reading comprehension, spelling, arithmetic fact retrieval, & calculation

• Comorbidity.

  – High rates of comorbidity amongst the various categories of LD across the lifespan and across divergent cultural/linguistic groups challenge their discreteness (Hart et al., 2009; Katusic et al., 2009; Kovas et al., 2007).

  – Academic impairments 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 (& ADHD), suggest that the cognitive profiles of these disorders differ only in subtle ways, mainly in terms of severity

• & the comorbidity between these disorders may be due to a common genetic risk factor leading to slow processing speed

(Willcutt et al., 2010)
Evidence for splitting or lumping SLDs:

*Predictive Validators - 1*

- **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)
Cautions

• **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) (Barbaresi 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)
Recommendation #1

◆ One overarching category of LD
◆ descriptive feature specifiers to detail current manifestation

• (specifiers include & extend DSM-IV disorders)***
  - *Reading*: word reading accuracy; reading fluency; reading comprehension
  - *Written Expression*: Spelling accuracy; Grammar & punctuation accuracy; Clarity or organization of written expression
  - *Mathematics*: Memorizing arithmetic facts; Accurate or fluent calculation; Effective math reasoning

***Clinicians may opt to use the terms ‘dyscalculia’ and ‘dyslexia’ if preferred, but are strongly encouraged to check all the the areas impaired
One problem with the DSM-IV diagnostic criteria for SLD

• There are no diagnostic criteria for Learning Disorders per se... just for each of the specified types of LD!
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.
Question #2: Is the IQ-achievement discrepancy criterion valid?

- 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 with or without an IQ-achievement discrepancy do not differ reliably in clinically meaningful ways:
  - **Antecedent Validators:**
    - Familial aggregation of spelling problems
  - **Concurrent Validators**
    - Cognitive processing skills that contribute to learning:
      - Biological brain basis
  - **Predictive Validators**
    - Long-term prognosis:
      - Response to intervention:
Recommendation #2

- Eliminate the use of IQ-achievement discrepancy

- But with what do we replace it?
So how should we define SLD?

• At least average IQ?
  – to differentiate SLD from general learning difficulties associated with intellectual disability
• Low academic achievement?
• Persistence of learning difficulties?
• Cognitive deficits?
• Response to intervention?
Solely by low achievement (LA)?

• Children may struggle to achieve academically for many reasons - not just due to dyslexia or LD
• High rate of false positives when used low achievement as sole criterion
Cognitive processing deficits?

• Association between cognitive processing deficits & dyslexia is probabilistic, not deterministic

• This means that a clinician cannot use a specific cognitive profile to rule in/out a diagnosis of dyslexia

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### Dyslexic Cases in CLDRC: Cross-Tabulation of Overall Model Fit, Based on the “Counting Deficits” and the Individual Regression Fit Methods Applied to Individual Cases

<table>
<thead>
<tr>
<th>Deficit</th>
<th>PA only</th>
<th>L only</th>
<th>PS/NS only</th>
<th>PA and L</th>
<th>PA and PS/NS</th>
<th>L and PS/NS</th>
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<tbody>
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<td>4</td>
<td>13</td>
<td>6</td>
<td>15</td>
<td>18</td>
</tr>
</tbody>
</table>

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

Pennington et al (2012) J Abnormal Psychology 121(1)
Rationale for exclusion of psychological processes in diagnostic criteria

• **Clinical utility:**
  – If included, diagnosis must await full & costly psychological/neuropsychological assessment; may result in inequitable access to such assessment

• **Scientific:**
  – Evidence that psychological processes associated with RD – the most common & well-documented LD – are probabilistic, varied, & reliance on phonemic awareness for diagnosis would miss many individuals (Pennington et al 2012)
  – Psychological processes associated with math or written expression remain unclear – especially cross-culturally
Inclusion of Response to Intervention (RTI)?

- Tier 1: Universal Screening or Class-wide Assessment
- Tier 2: Targeted small-group interventions
- Tier 3: Intensive individual interventions

SLD?
Inclusion of Response to Intervention (RTI)?

• The central premise of the RTI approach to the identification of students with SLD is the need to ensure that the learning difficulties cannot be attributed to inadequate instruction.

• Key questions:
  1. Does the RTI approach decrease the number of false positives (and thus decrease prevalence of SLD)? NO
  2. Is it necessary to complete Tier-2 intervention before SLD can be identified? UNCLEAR
Recommendation # 4: Uniform approach for diagnostic criteria for neurodevelopmental disorders

A. Key characteristics of the disorder
B. Measurement of the key characteristics
C. Age at onset of symptoms
D. Exclusionary criteria
Recommended diagnostic criteria for SLD in DSM-5

(KEY CHARACTERISTICS):

A. Persistent difficulties in learning and using academic skills, as indicated by the presence of at least one of the following symptoms....(examples)

• 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)

• Difficulties with spelling
  – (e.g., may add, omit, or substitute vowels or consonants)
Recommended diagnostic criteria for SLD in DSM-5 ..continued

(Measurement)

B. 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.
C. 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).
D. The learning difficulties are not better accounted for by Intellectual Disability, Global Developmental Delay, uncorrected visual or auditory acuity, other mental or neurologic disorders, psychosocial adversity, lack of proficiency in the language of academic instruction, or inadequate educational instruction.
Operationalizing the criteria for SLD

- “Persistence” defined as > 6 months
  - Data suggests 1 academic year for math
- Academic skills substantially & quantifiably below age..  
  - Typically score(s) at least 1.5 SD below mean for age (SS ≤ 78, or < 5th %ile) 
  - Clinical judgment for use of more lenient cut-off (e.g., about average performance but requires extraordinary effort) 
  - Based on individually administered, culturally appropriate, & psychometrically sound norm-referenced measure of academic achievement
- Absence of an intellectual disability as defined by DSM-5, typically indicated by an IQ score > 70 (± 5 ) plus age-appropriate adaptive behavior
Severity Specifiers for SLD

• **Mild, Moderate, Severe**

• Based on:
  – Range of academic domains affected
  – Likely level of proficiency with/without need
    • Specialized teaching,
    • Accommodations
    • Services
    • Technology
Diagnosis is not the end, but the beginning of [clinical/educational] practice.

[and clinical/educational research!]

Martin H. Fischer
(1879 - 1962)
German-American physician and writer.
Discussion
–open to all participants

HSC psychology
ADHD: Proposals for DSM5

ADHD Work Group

- ODD, CD Subgroup, Consultants, Liaison members

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