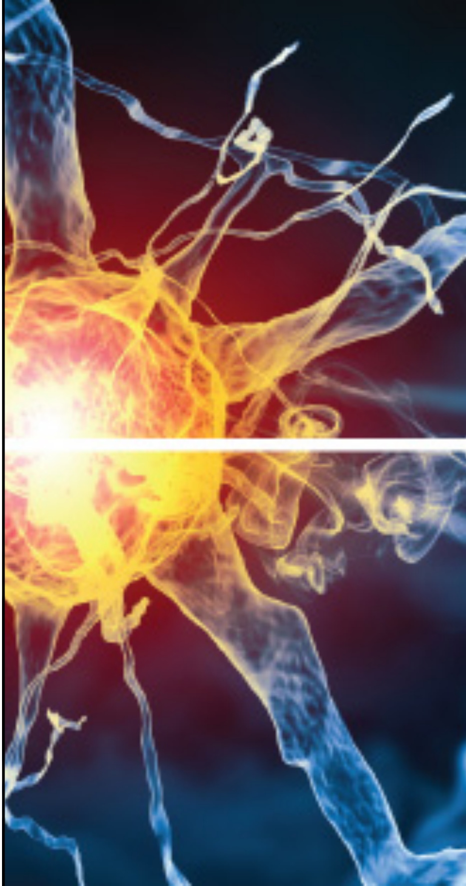
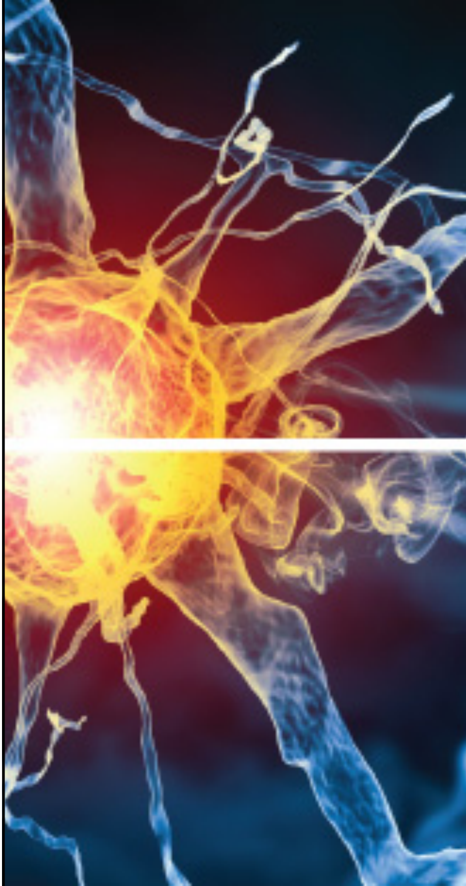


From Description to Mechanism: Advances in Psychiatric Classification in ICD, DSM, and RDoC



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New York State Psychiatric Institute

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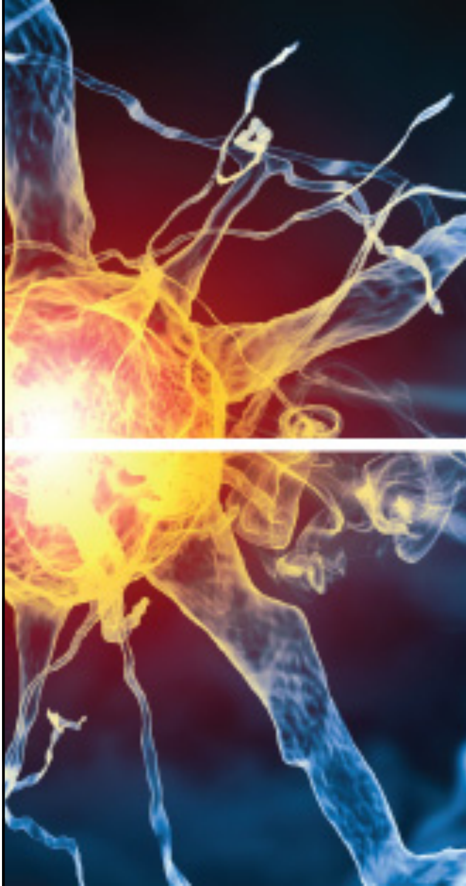
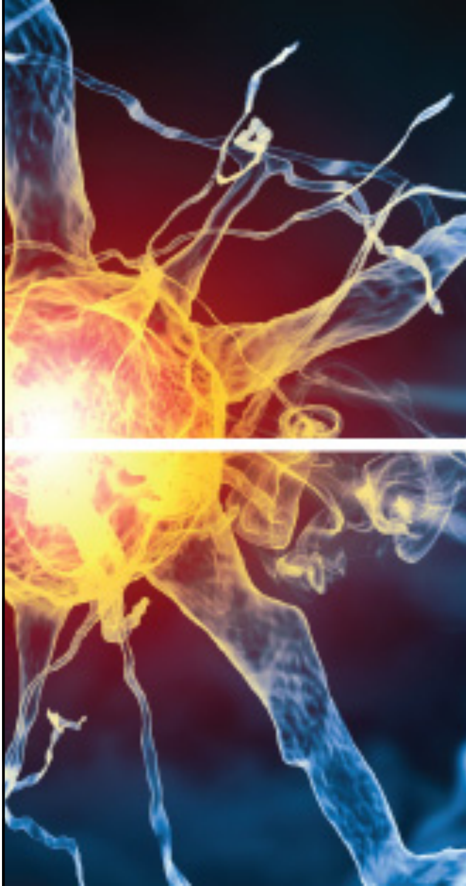
Disclosures

- Dr. Lewis-Fernández has no disclosures to report.



1 Learning Objective

Review the uses and limitations of descriptive psychiatric nosologies.



2 Learning Objective

Present three classification systems and review four key areas that any nosology must address.

Overview

- ***Main problem:*** Psychiatric classification systems based on signs and symptoms (ICD-11, DSM-5) are increasingly considered invalid, but are in daily use.
- What should clinicians do about that?
- How should our nosologies evolve?

Outline

- Uses and limitations of descriptive nosologies
- Three solutions: ICD, DSM, and RDoC
- Four areas any nosology must address
  - Etiology
  - Dimensions and categories
  - Thresholds
  - Comorbidity
- Conclusions and clinical implications

Reference: Clark LA, Cuthbert B, Lewis-Fernández R, Narrow W, Reed GM. ICD-11, DSM-5, and RDoC: Three Approaches to Understanding and Classifying Mental Disorder. Psychological Science in the Public Interest. Under review.

Crisis in Descriptive Psychiatric Nosology

- Daily clinical use of “descriptive” nosologies
- Critiques from biological and cultural psychiatry
- Inadvertent reification
  - Symptoms AS disorder, not SIGNS of disorder
- Development of NIMH Research Domain Criteria (2009)

Uses of Descriptive Nosologies

- Determining what is a "case"
- Reporting health statistics
- Implementing administrative aspects of care
- Communicating clinically within and across countries
- Guiding clinical trials (before RDoC)

Relationship Between Criteria and Disorder

Constitutive

- *The criteria definitively define the disorder. Having a disorder is nothing more than meeting the criteria.*

Indexical

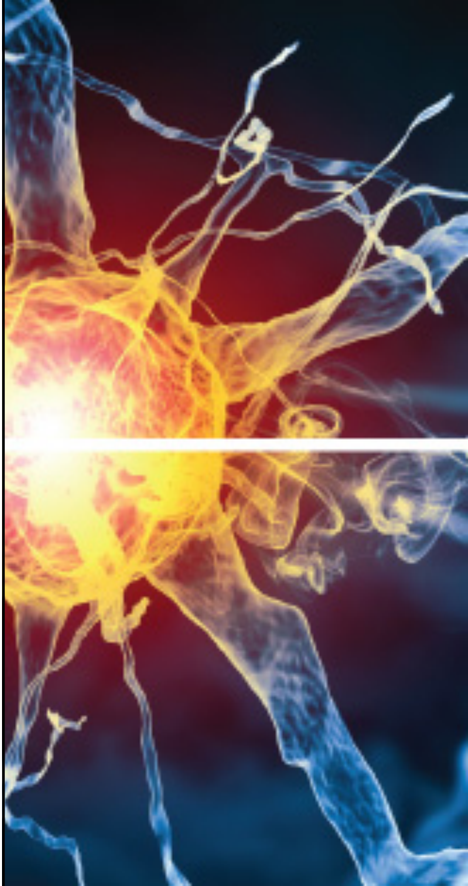
- *The criteria are fallible indices of a disorder understood as a hypothetical tentative diagnostic construct.*

The constitutive position is premature and reflects a conceptual error. It assumes a definitiveness and a literalism about the nature of our criteria that is far beyond our current knowledge. The indexical position with its tentativeness and modesty accurately reflects the current state of our field.

Kenneth Kendler
Psychological Medicine, 2017

Why Does This Matter?

- Diagnoses do not indicate discrete diseases
- Diagnoses are labels – “maps” – of more complex realities
- Focusing on the maps instead of the underlying processes:
  - Ignores dimensional nature of psychopathology
  - Obscures variations due to culture, age, gender, class, etc.
  - Minimizes pathogenic social structures
  - Hinders discovery of illness mechanisms
  - Impedes prevention of illness onset and morbidity
  - Limits prognostic ability
- Resulting in limited therapeutic efficacy



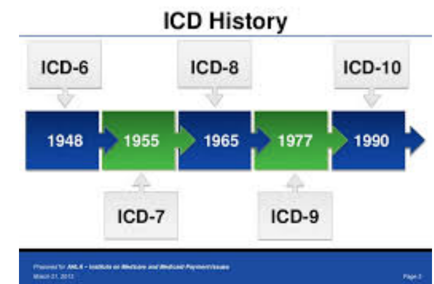
How to proceed?

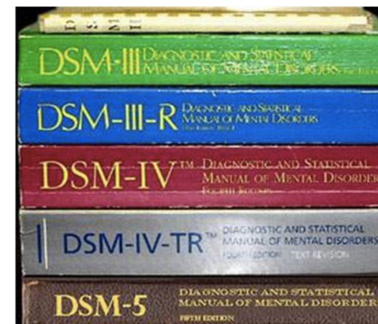
Different Solutions

- International Classification of Diseases
- Diagnostic & Statistical Manual of Mental Disorders
- Research Domain Criteria

Evolution of ICD and DSM

- List of mortality etiologies ⟶ broader classification
- ICD-8 (1965) / DSM-II (1968)
  - Harmonization of diagnostic categories
  - Hierarchical progression from neurosis to psychosis
- ICD-9 (1977) / DSM-III (1980)
  - Increasing standardization
- ICD-10 (1990) / DSM-5 (2013)
  - Decreasing diagnostic hierarchies





ICD/DSM Priorities

ICD-9 to ICD-11

- Maximize global utility
  - Essential features, diagnostic guidelines, inclusions/ exclusions
  - Designed for flexible application in diverse clinical & cultural settings
- Multiple documents for various uses (e.g., CDDG, primary care, research)

DSM-III to DSM-5

- Maximize reliability
  - Criteria: signs/symptoms, specific thresholds, exclusions
  - Designed for identifying valid underlying diseases
- Single document for all uses

RDoC (2009)

- NIMH long-term solution
- Framework for research, not yet a nosology
- Based on basic components of mental and emotional activity
- Nosology “from the ground up” but vetted “from the top down”

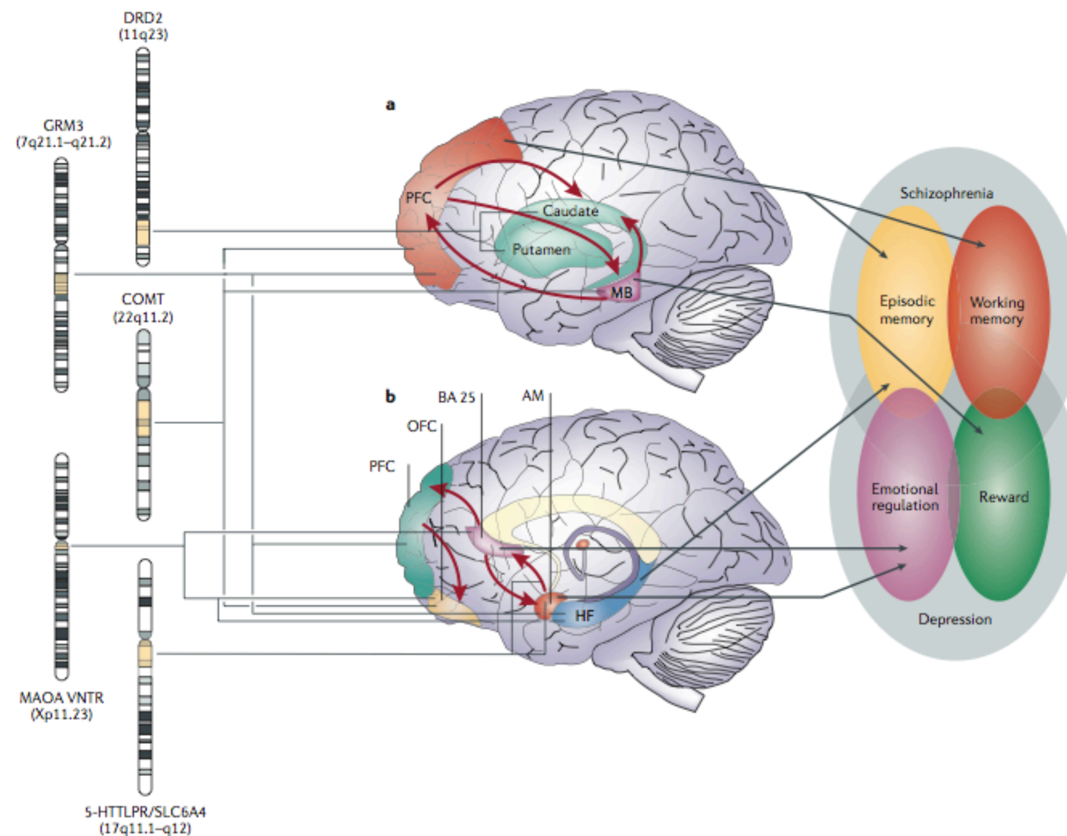
Domains/Constructs and Units of Analysis

v. 3.3, 01/15/2012	DRAFT RESEARCH DOMAIN CRITERIA MATRIX							
	UNITS OF ANALYSIS							
DOMAINS/ CONSTRUCTS	**Genes**	**Molecules**	**Cells**	**Circuits**	**Physiology**	**Behavior**	**Self-Reports**	**Paradigms**
Negative Valence Systems								
Acute threat ("fear")								
Potential threat ("anxiety")								
Sustained threat								
Loss								
Frustrative nonreward								
Positive Valence Systems								
Approach motivation								
Initial responsiveness to reward								
Sustained responsiveness to reward								
Reward learning								
Habit								
Cognitive Systems								
Attention								
Perception								
Working memory								
Declarative memory								
Language behavior								
Cognitive (effortful) control								
Systems for Social Processes								
Facial expression identification								
Affiliation/Separation								
Self & Other								
Social dominance								
Arousal/Regulatory Systems								
Arousal & regulation (multiple)								
Resting state activity								

Cuthbert B. *World Psychiatry*. 2014;13:28-35.

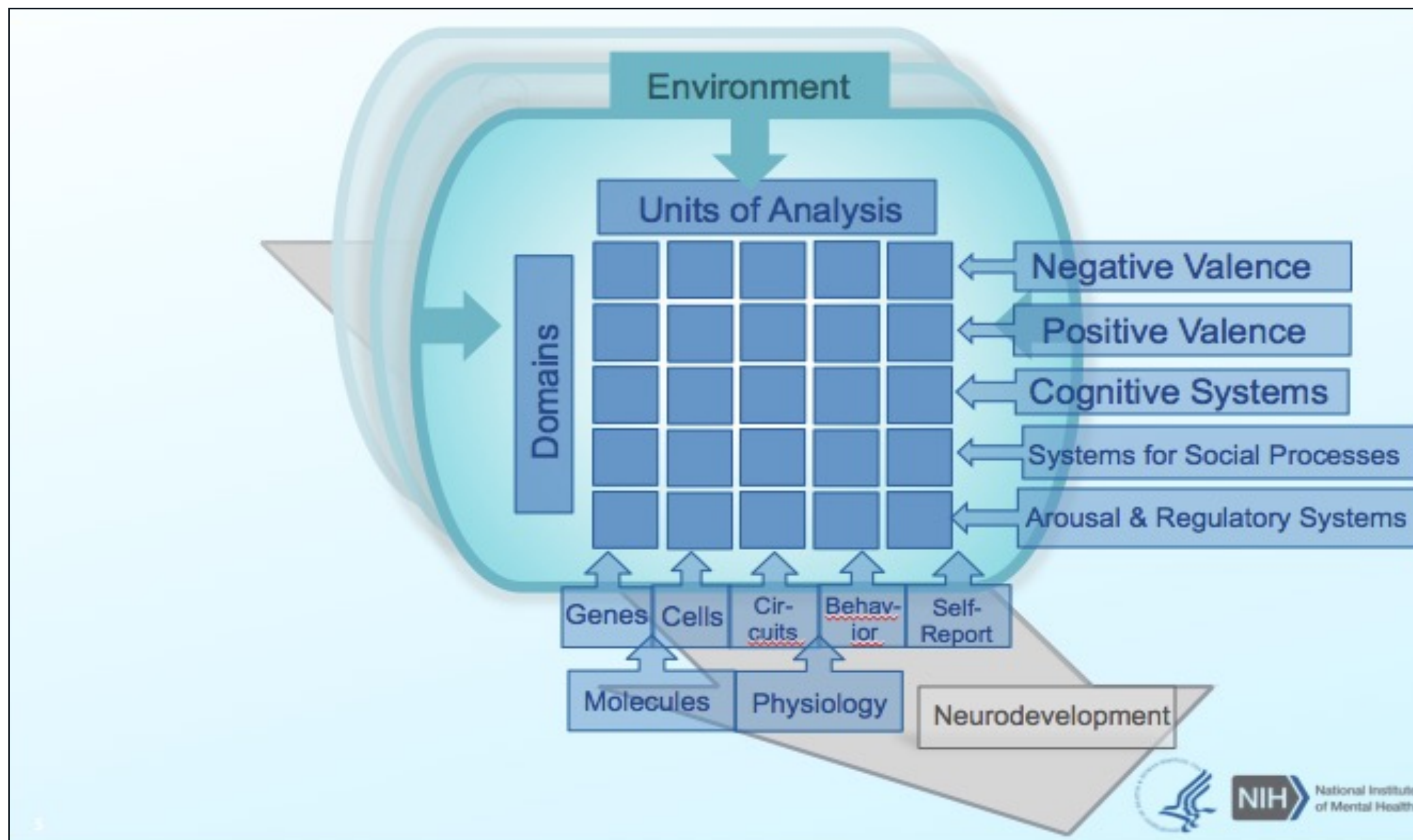
NIMH
National Institute of Mental Health

Brain Circuits: Pathways to Pathophysiology



Meyer-Lindenberg A, Weinberger DR. *Nat Rev Neurosci*. 2006;7(10):818-827.

The RDoC Franmework's Dimensions



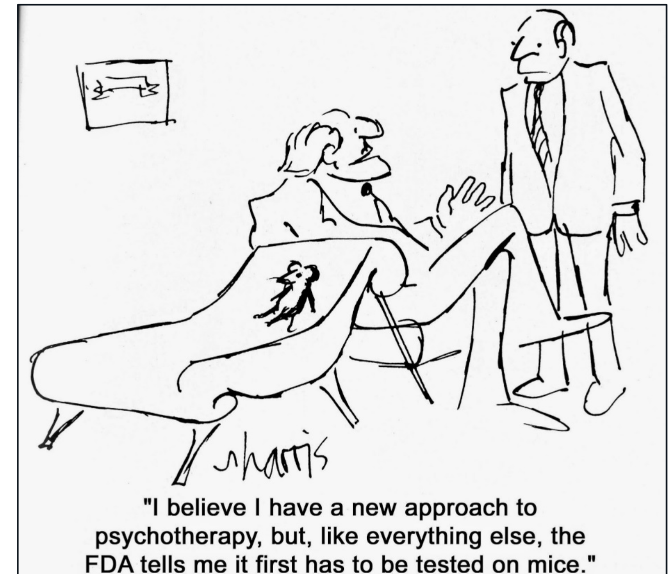
Critiques of RDoC

- Dominant focus on neural circuitry
  - High risk of ontological & epistemological reductionism
- Underdeveloped levels of environment & development
  - Brain develops in interaction with socio-cultural context
  - This level of interaction is not reducible to neural circuitry
- Limited attention to emergent properties of complex systems
  - Same biological substrates can give rise to different outcomes

Lilienfeld SO. *Behav Res Ther*, 2014;62:129-139.; Paris J, Kirmayer LJ. *J Nerv Ment Dis*. 2016;204(1):26-32.

Critiques of RDoC

- Over-reliance on animal models
  - Poor modeling of social/reflective influences on psychopathology
- Multiple measurement limitations, including low reliability
- Very long timeframe, only partly acknowledged
  - Until then, how to advance clinical research?



"I believe I have a new approach to psychotherapy, but, like everything else, the FDA tells me it first has to be tested on mice."

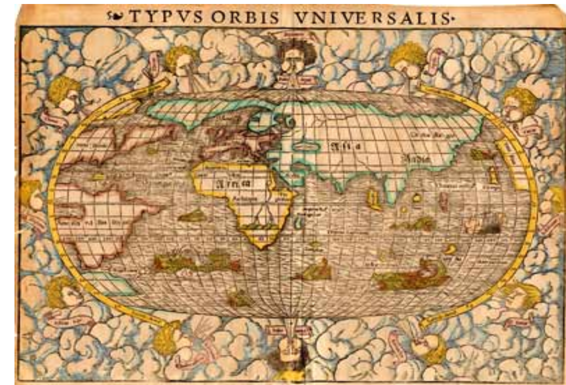
Lilienfeld SO. *Behav Res Ther*, 2014;62:129-139.; Paris J, Kirmayer LJ. *J Nerv Ment Dis*. 2016;204(1):26-32.

Four Key Areas That Any Nosology Must Address

1. Etiology
2. Dimensions and categories
3. Thresholds
4. Comorbidity

Etiology

- Psychopathology is multi-causal
  - Biological, psychological, social, cultural
- Causes are never fully “primary”
- Causes interact in complex ways & are always in flux
  - Epigenetics
- Problems:
  - Capturing multiple causes
  - Indicating interactions



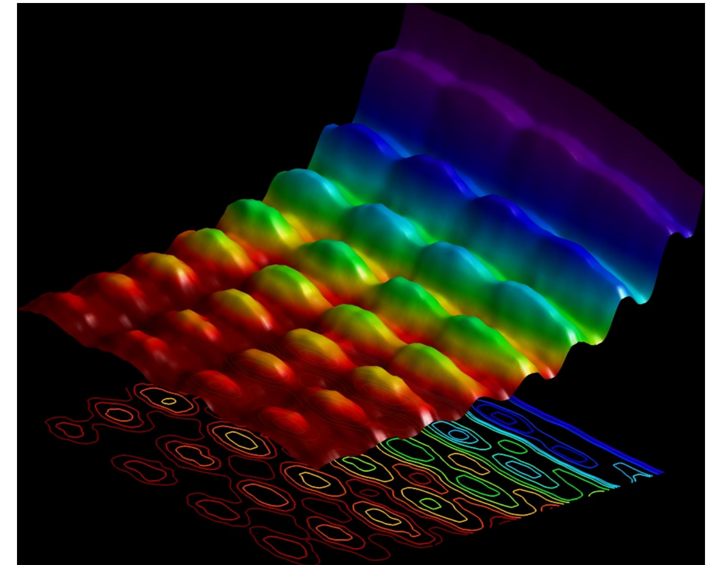
Etiology

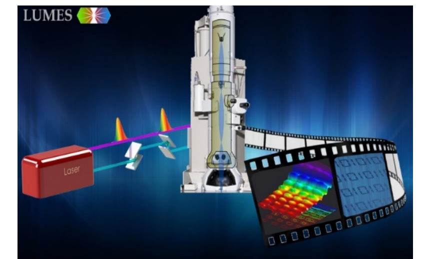
<table>
<tr><th>ICD-11</th><th>DSM-5</th><th>RDoC</th></tr>
<tr><td colspan="2">• Limited biological etiology
• No intrapsychic causes & organic/psychogenic distinction</td><td rowspan="2">• Primarily biological
• Limited environmental</td></tr>
<tr><td>• Etiological qualifiers
• Coding options
• International Classification of Functioning, Disability and Health (ICF, 2001)</td><td>• Text on Risk/Prognostic factors & Culture/Gender
• Cultural Formulation Interview
• Other conditions that may be focus of clinical attention</td></tr>
</table>

Reference: Clark LA, Cuthbert B, Lewis-Fernández R, Narrow W, Reed GM. ICD-11, DSM-5, and RDoC: Three Approaches to Understanding and Classifying Mental Disorder. *Psychological Science in the Public Interest*. Under review.

Dimensions and Categories

- Severity gradient of mental illness is continuous, not "all or none"
  - Severity is an essential feature
- Diagnostic categories are often multidimensional
- Supraordinate dimensions?
- Syndromes are also informative
- Problem:
  - Capturing the dual character of psychopathology





Caspi A, et al. *Clin Psychol Sci*, 2014;2(2):119-137; Brittain PJ, et al. *PLoS ONE*.2013;8(3):e58790.

Dimensions and Categories

<table>
<tr><th>ICD-11</th><th>DSM-5</th><th>RDoC</th></tr>
<tr><td colspan="2">• Dimensional ratings of severity & disorder components
• Elimination of some subtypes</td><td rowspan="2">• Healthy to severely pathological range</td></tr>
<tr><td>• Dimensional diagnoses (e.g., personality, paraphilia)</td><td>• Severity scales
  • Disorder & cross-cutting
• Hybrid dimensional/ categorical personality disorder diagnosis</td></tr>
</table>

Reference: Clark LA, Cuthbert B, Lewis-Fernández R, Narrow W, Reed GM. ICD-11, DSM-5, and RDoC: Three Approaches to Understanding and Classifying Mental Disorder. *Psychological Science in the Public Interest*. Under review.

Thresholds

Though no man can draw a stroke between the confines of day and night, yet light and darkness are upon the whole tolerably distinguishable

Edmund Burke
Thoughts on the Present Discontents, 1770

Thresholds

- Thresholds are essential
- Somewhat arbitrary but very consequential
- Multiple thresholds must be considered at once
- Risk of false positives
- Solutions can confound disorder and outcome

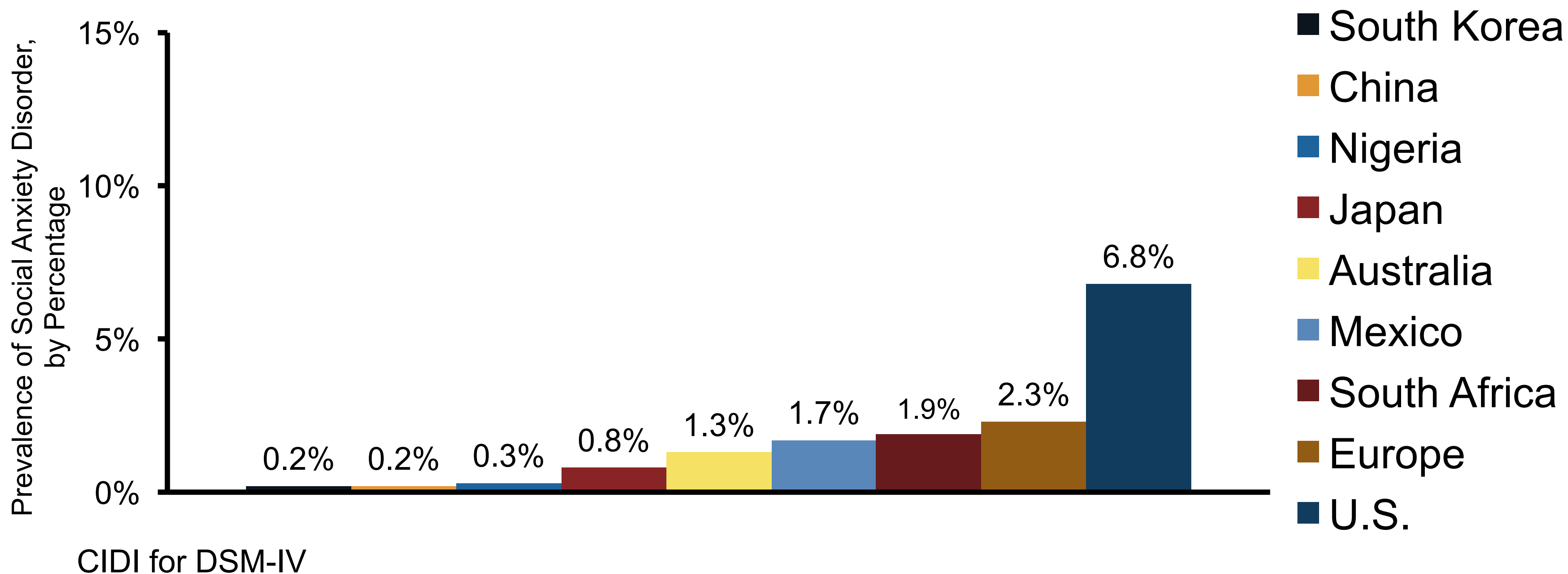
- Problems:
  - Over-specification
  - Medicalization

Thresholds

<table>
<tr><th>ICD-11</th><th>DSM-5</th><th>RDoC</th></tr>
<tr><td colspan="2">• Definition of mental disorder
• Limited inclusion of “distress or impairment”</td><td rowspan="2">• Agnostic to current thresholds
• Search for empirical thresholds</td></tr>
<tr><td>• Essential/associated features
• Varying thresholds by use
• Not intended for research
• Text on Boundary with Normality</td><td>• Criteria & subcriteria
• One threshold for all uses
• Intended for research
• Greater use of clinical significance criterion</td></tr>
</table>

Reference: Clark LA, Cuthbert B, Lewis-Fernández R, Narrow W, Reed GM. ICD-11, DSM-5, and RDoC: Three Approaches to Understanding and Classifying Mental Disorder. *Psychological Science in the Public Interest*. Under review.

12-Month Prevalence of Social Anxiety Disorder



CIDI = Composite International Diagnostic Interview

Lewis-Fernández R, et al. *Depress Anx.* 2010;27(2):212-229.

Comorbidity

- Having 2+ disorders at the same time
- The rule rather than the exception
- Co-occurrence, artifact, or due to common underlying processes?
- Direct relationship between severity and comorbidity
- Value of specified disorders?

- Problems:
  - Artefactual comorbidity
  - Missing important symptoms

Comorbidity

<table>
<tr><th>ICD-11</th><th>DSM-5</th><th>RDoC</th></tr>
<tr><td colspan="2">• Limited hierarchy rules
• Pragmatic, not literal, solutions</td><td rowspan="2">• Brain-behavior constructs that cut across diagnostic boundaries</td></tr>
<tr><td>• Single diagnosis of PD
• Text on Boundary with other Disorders
• Coding techniques</td><td>• Hybrid proposal for PD
• Spectra
• Text on DDx & Comorbidity
• Cross-cutting symptoms
• Relationship to Cultural Concepts of Distress</td></tr>
</table>

Reference: Clark LA, Cuthbert B, Lewis-Fernández R, Narrow W, Reed GM. ICD-11, DSM-5, and RDoC: Three Approaches to Understanding and Classifying Mental Disorder. *Psychological Science in the Public Interest*. Under review.

- ICD-11 & DSM-5:
  - Re-structured nosology
  - Introduced spectra
  - Provided “extra-diagnostic” ways to capture complexity
  - Incorporated dimensionality
  - Described developmental, socio-cultural & gender aspects
- But much more is left to be done
- RDoC is not yet a nosology

Strengths and Weaknesses

- Nosologies are shaped by uses, histories, and constituencies
  - ICD & DSM
    - Categorical definitions with limited dimensionality
  - ICD
    - Flexibility
  - DSM
    - Standardization
  - RDoC
    - Focused on dimensionality & etiology but at high risk of reductionism

Practical implications

"Unless and until a better alternative comes along, we appear to be stuck with the DSM and ICD, whether we like it or not."

Scott Lilienfeld

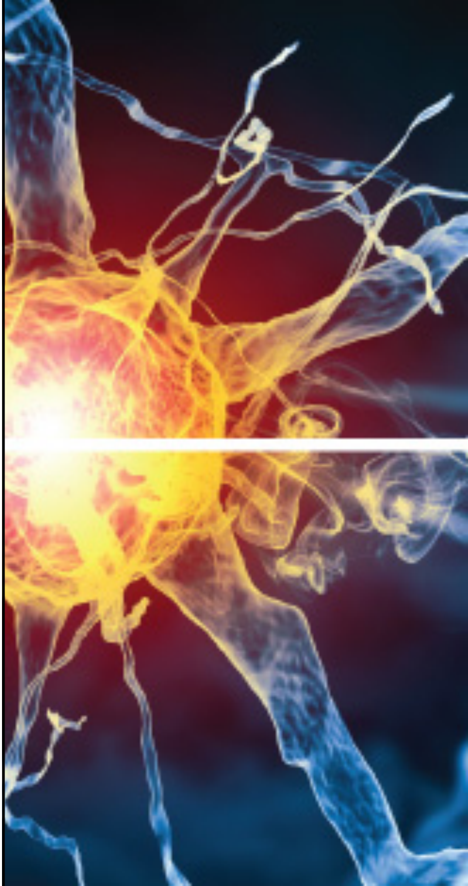
Behaviour Research & Therapy, 2014

- Healthy skepticism
- A limited map, rather than an empirical guide

World Association of Cultural Psychiatry

5th World Congress
October 11-13, 2018
New York City

Wacp2018.org



Questions & Answers