



# MATH DISABILITIES EVALUATION GUIDE

This quick reference guide summarizes the nuts and bolts of what school psychologists need to know about math disabilities (dyscalculia) when planning their assessments. This guide delineates math disorder subtypes, includes correlated cognitive processes, and provides a menu of test batteries (in English and Spanish) that fall under each respective capacity.

## WHEN TO ASSESS FOR DYSCALCULIA?

Referral concerns include difficulties with one or all of the following: overreliance on manipulatives and math charts; using fingers to calculate; difficulty with speeded math fluency tasks; difficulty with counting (forward-backward and by 2s, 5s, and 10s); forgetting math procedures and algorithms for multistep problems; losing their place on number lines (must keep going back to 1 on the number line); visual-spatial errors (poor alignment of numbers within columns); poor estimation skills; struggling with geometry and graphing; and difficulty with mental math, math concepts, and math problem-solving (Feifer, 2017; Feifer & Clark, 2016).

## WHAT AREAS ARE IMPORTANT TO ASSESS AS PART OF A DYSCALCULIA EVALUATION? TOOLS TO USE?

*Best practice is to get at least two measures (or one composite) under each area; if subtest scores are discrepant, then be sure to follow up with a third test in that area (Dehn, 2014; Flanagan et al., 2013).*

*\*Spanish tests*

### EXECUTIVE FUNCTIONING

- ADHDT-2 Hyperactivity Index
- BASC-3 Executive Functioning Content Scale
- BRIEF-2 Behavior Regulation, Cognitive Regulation, Emotion Regulation, Global Executive Composites
- Brown EF/A Scales Activation, Emotion, Action Indices
- CAS2 Planned Codes, Planned Connections, Planned Number Matching
- \*CAS2 Spanish Planned Codes, Planned Connections, Planned Number Matching
- Conners 3 Executive Functioning Index (short form or long form)
- D-KEFS Color-Word Conditions 3 and 4 (Inhibition, Inhibition/Switching), Sorting Confirmed Correct Sorts, Tower Total Achievement, Trail Making Combined, Verbal Fluency Category Switching Total Switching
- DTLA-5 Trail Making
- MEFS Efficiency, Engagement, Inquiry, Optimization, Solution Scores
- NEPSY-II Animal Sorting, Auditory Attention Response Set, Inhibition Inhibition Combined, Inhibition Naming Combined
- TEC Response Control, Response Variability, Sustained Accuracy
- Trails X Total Matrix

### ATTENTION

- ADHDT-2 Inattention Index
- BASC-3 Attention Problems Index
- Brown EF/A Scales Focus, Effort Indices
- CAS2 Attention Composite
- \* CAS2 Spanish Attention Composite
- CEFI Attention Index
- D-REF Attention/Working Memory Composite
- Conners 3 Inattention Composite (short form or long form)
- Conners CATA (Commissions, Detectability, Omissions)
- Conners CPT 3 (Commissions, Detectability, Omissions)
- Leiter-3 Attention Sustained Index
- MEFS Attention Index
- NEPSY-II Auditory Attention
- TEA-Ch2 Selective Attention, Sustained Attention Composites
- TEC Selective Attention

## ORAL LANGUAGE

- \*Batería IV Comprehension-Knowledge Cluster
- CASL-2 General Language Ability, Receptive Language Ability, Receptive Language, Expressive Language, Lexical/Semantic, Syntactic, Supralinguist Composites
- \*CELF-4 Spanish Core Language, Expressive Language, Language Content, Language Memory, Language Structure, Receptive Language Composites
- CELF-5 Core Language, Expressive Language, Language Content, Language Memory, Language Structure, Receptive Language Composites
- FAR Semantic Concepts
- FAM Linguistic Math Concepts
- KABC-II NU Knowledge Composite
- KTEA-3 Oral Expression, Association Fluency
- NEPSY-II Word Generation
- Ortiz PVAT Picture Vocabulary
- TAPS-4 Processing Oral Directions
- WIAT-4 Oral Expression Composite
- WJ-IV Cog Comprehension-Knowledge Cluster
- \*WJ-IV OL Oral Language Cluster, Broad Oral Language Cluster, Oral Expression Cluster, Listening Comprehension Cluster, Lenguaje oral, Amplio lenguaje oral, Comprensión auditiva
- \*WMLS III Listening, Speaking; Broad English Oral Language, Basic English Oral Language, Escuchar, Hablar, lenguaje oral amplio en español, lenguaje oral básico en español

## FLUID REASONING

- \*Batería IV Fluid Reasoning Cluster
- CAS2 Matrices
- \*CAS2 Spanish Matrices
- CTONI-2 Geometric Scale
- CTONI-2 Pictorial Scale
- DAS-II Matrices, Picture Similarities, Sequential and Quantitative Reasoning
- \*DAS-II Spanish Matrices, Picture Similarities
- D-KEFS Proverbs Total Achievement Free Inquiry, Sorting Confirmed Correct Sorts, Twenty Questions Initial Abstraction and Total Weighted Achievement, Word Context Total Consecutively Correct
- D-REF Abstract Thinking/Problem-Solving Composite
- KABC-II NU Planning Composite
- Leiter-3 Classification/Analogies, Sequential Order
- FAM Sequences
- NNAT-I Composite Score
- RIAS-2 Nonverbal Intelligence
- UNIT 2 Quantitative, Reasoning Composites
- WISC-V Fluid Reasoning, Quantitative Reasoning Composites, Similarities subtest
- \*WISC-V Spanish Fluid Reasoning, Quantitative Reasoning Composites
- WISC-V Fluid Reasoning, Expanded Fluid Quantitative Reasoning Reasoning Composites
- \*WISC-V Spanish Expanded Fluid Reasoning Composites, Quantitative Reasoning Fluid Reasoning
- WJ-IV Cog Fluid Reasoning, Fluid Reasoning Extended, Quantitative Reasoning Clusters
- WNV Matrices
- WPPSI-IV Fluid Reasoning Composite

## VISUAL-SPATIAL

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- KABC-II NU Simultaneous Processing Composite
- \*Batería IV Visualization
- CAS2 Verbal-Spatial Relations, Spanish Verbal-Spatial Relations
- DAS-II Pattern Construction
- \*DAS-II Spanish Pattern Construction
- Leiter-3 Figure Ground, Form Completion, Visual Patterns
- MVPT-4 Total Score
- NEPSY-II Arrows Total, Block Construction Total, Geometric Puzzles Total
- TVPS-4 Figure Ground, Form Consistency, Spatial Relationships, Visual Closure, Visual Discrimination
- UNIT-2 Cube Design
- WAIS-IV Block Design, Picture Completion, Visual Puzzles
- WISC-V Visual-Spatial Composite
- \*WISC-V Spanish Visual-Spatial Composite
- WPPSI-IV Visual-Spatial Composite
- WJ-IV Cog Visualization
- WNV Object Assembly, Picture Arrangement
- WPPSI-IV Block Design, Object Assembly

## LONG-TERM RECALL

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Give at least one measure in verbal long-term memory and one in visual long-term memory (Dehn, 2014). Rapid Naming in numbers versus letters is preferred (Feifer & Clark, 2016).

- \*Batería IV Rapidez en la identificación de dibujos
- CTOPP-2 Rapid Symbolic Naming Composite
- ChAMP Verbal Memory, Visual Memory, Immediate Memory, Delayed Memory, Total Memory Indices
- DAS-II Rapid Naming
- ECAD Rapid Picture Naming
- FAR Rapid Automatic Naming, Verbal Fluency, Word Recall
- FAM Rapid Number Naming
- FAW Retrieval Fluency
- KABC-II NU Learning Composite, Delayed Recall Composite
- KTEA-3 Oral Fluency Composite
- NEPSY-II Memory for Designs Delayed, Memory for Faces Delayed
- WISC-V Naming Speed and Symbol Translation Composites
- WJ-IV Cog Long-Term Retrieval Cluster
- WJ-IV OL Speed of Lexical Access Cluster
- WMS-IV Designs II, Visual Reproduction II
- WRAML3 Verbal Recognition, Verbal Delayed, Visual Recognition, and Visual Delayed Composites

## WORKING MEMORY

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Give at least one measure in verbal working memory and one in visual working memory (Dehn, 2014).

- \*Batería IV Short-Term Working Memory Composite
- \*CELF-4 Spanish Working Memory Composite
- CAS2 Sentence Questions, Sentence Repetition, Word Series, Figure Memory, Visual Digit Span
- \*CAS2 Spanish Sentence Questions, Sentence Repetition, Word Series, Figure Memory, Visual Digit Span
- CELF-5 Recalling Sentences
- CTOPP-2 Phonological Memory Composite
- DAS-II Working Memory Composite
- \*DAS-II Spanish Working Memory Composite
- ECAD Memory for Names
- ECAD Sentence Repetition
- FAM Numeric Capacity, Executive Working Memory, Spatial Memory
- KABC-II NU Sequential Composite, Face Recognition, Hand Movements
- Leiter-3 Forward Memory, Reverse Memory
- NEPSY-II Memory for Names Total, Narrative Memory Free Recall Total, Repetition of Nonsense Words Total, Sentence Repetition Total, Word List Interference Repetition Total, Memory for Designs Total, Memory for Faces Total
- RIAS-2 Verbal Memory, Nonverbal Memory
- TAPS-4 Auditory Memory Composite
- TVPS-4 Sequential Memory, Visual Memory
- UNIT 2 Memory
- WAIS-IV Working Memory Composite
- WIAT-4 Sentence Repetition
- WISC-V Working Memory and Auditory Working Memory Composites
- \*WISC-V Working Memory and Spanish Working Memory Composites
- WJ-IV Cog Short-Term Memory, Short-Term Memory Extended and Auditory Memory Span Composites
- WJ-IV OL Sentence Repetition, Understanding Directions
- WMS-IV Visual Working Memory Composite
- WPPSI-IV Working Memory Composite
- WRAML3 Visual Immediate Memory, Verbal Working Memory

## PROCESSING SPEED

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- \*Bateria IV Processing Speed Composite, Perceptual Speed Composite
- Conners CATA HRT
- Conners CPT 3 HRT
- DAS-II Processing Speed Composite
- \*DAS-II Spanish Processing Speed Composite
- RIAS-2 Speeded Picture Search
- WAIS-IV Processing Speed Composite, Cancellation
- WISC-V Processing Speed Composite, Cancellation
- \*WISC-V Processing Speed Composite, Cancellation
- WJ-IV Cog Processing Speed Composite, Perceptual Speed Cluster
- WNV Coding
- WPPSI-IV Processing Speed Composite
- TEA-Ch2 Simple RT
- TEC Response Speed

## MATH FLUENCY

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\*Bateria IV Math Facts Fluency  
ECAD Number Sense  
FAM Addition Fluency, Addition Knowledge, Division Fluency, Division Knowledge, Multiplication Fluency, Multiplication Knowledge, Subtraction Fluency, Subtraction Knowledge  
KTEA-3 Math Fluency  
WIAT-4 Math Fluency-Addition, Math Fluency-Multiplication, Math Fluency-Subtraction  
WJ-IV Ach Math Facts Fluency

## MATH CALCULATION

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\*Bateria IV Math Calculation Skills Cluster  
FAM Semantic Index  
KTEA-3 Math Computation  
WIAT-4 Numerical Operation  
WJ-IV Ach Math Calculation Skills Cluster

## MATH PROBLEM-SOLVING

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\*Bateria IV Math Reasoning Cluster  
FAM Equation Building, Linguistic Math Concepts  
KTEA-3 Math Concepts & Applications  
WJ-IV Ach Math Problem-Solving Cluster

## WHEN TO ASSESS FOR DYSCALCULIA?

1. Verbal Dyscalculia subtype (Feifer, 2017; Feifer & Clark, 2016)
  - Impairment in rapid number identification skills, difficulty overlearning math information, and deficits in automatically retrieving/recalling stored math facts.
  - Observations: Overreliance on manipulatives and math charts, use of fingers, poor performance on speeded math fluency tasks, may also present with other language-related disabilities.
2. Procedural Dyscalculia subtype (Feifer, 2017; Feifer & Clark, 2016)
  - Disordered in understanding numeric patterns and procedures. Impairment in sequencing and counting; ordering and sequential positioning; difficulty with algorithms, place value, and sequencing math procedures.
  - Observations: Skips when counting; trouble counting by 2s, 5s, 10s, etc.; trouble counting forward and backward; forgets math procedures and algorithms for multistep problems; loses their place on number lines (keeps going back to 1).
3. Semantic Dyscalculia subtype (Feifer, 2017; Feifer & Clark, 2016)
  - Impairment with symbolic (conceptual) and/or nonsymbolic math. Symbolic difficulties include trouble understanding magnitudes and a lack of number sense. Nonsymbolic challenges relate to the visual-spatial aspect of mathematics.
  - Observations: Visual-spatial errors (poor alignment of numbers within columns), poor estimation skills, ability to compare magnitudes, processing of patterns and relationships, struggle with geometry and graphing, and difficulty with mental math.

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