

Interpretation and Validity of the PASS Scores from the CAS2

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Ideas to Consider

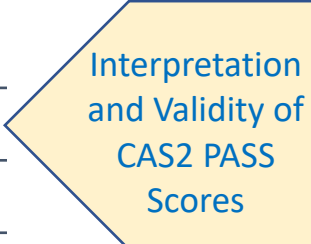
Description of the CAS2

Administration Details

Interpretation Details

Research Summary

Closing remarks




Interpretation
and Validity of
CAS2 PASS
Scores


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How to Measure PASS with CAS2


- CAS2 Core & Extended English & Spanish for comprehensive Assessment
- CAS2 Brief for re-evaluations, instructional planning, gifted screening
- CAS2 Rating Scale for teacher ratings
- CAS2: Online coming 2023







20 min




40 min





60 min


	CAS2 Rating Scale (4 subtests)	CAS2 Brief (4 subtests 20 minutes)	CAS2 Core (8 subtests 40 minutes)	CAS2 Extended (12 subtests 60 minutes)
	Total Score Planning Simultaneous Attention Successive	Total Score Planning Simultaneous Attention Successive	Full Scale Planning Simultaneous Attention Successive	Full Scale Planning Simultaneous Attention Successive Supplemental Scales Executive Function Working Memory Verbal / Nonverbal Visual / Auditory Speed / Fluency
				 <div style="border: 1px solid purple; padding: 5px; display: inline-block; margin-top: 10px;"> CAS2 Digital (English & Spanish) coming in late 2023 </div>

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• Scandinavian Edition

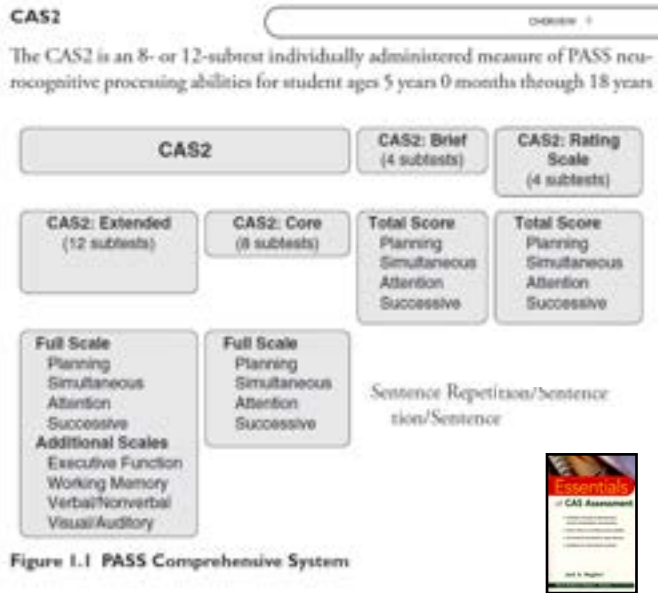





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CAS2 Structure

CAS2 Subtests	
Planning	Planned Codes Planned Connect Planned Number Matching
Simultaneous	Matrices Verbal-Spatial Relations Figure Memory
Attention	Expressive Attention Number Detection Receptive Attention Word Series
Successive	Sentence Repetition/ Sentence Questions Visual Digit Span



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CAS2 Rating Scales (Ages 4-18 yrs.)

- The CAS2: Rating measures behaviors associated with PASS constructs
- Completed by teachers and can be used by psychologists, special educators and regular educators



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CAS2 Online Score & Report for in person testing (2023)

- Enter data at the subtest level or enter subtest raw scores
- Online program converts raw scores to standard scores, percentiles, etc. for all scales.
- A narrative report with graphs and scores is provided



CAS2 Online Administration, Scoring and Report for Virtual Assessment (coming in 2023)

- Administer the CAS2 using two devices
- All subtests are administered in the usual manner
- Scoring is automatic (except for Word Series, Sentence Repetition and Questions)
- All raw scores instantly converted to standard scores, percentiles, etc. for all subtests and scales.
- A narrative report with graphs and scores is provided

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Administration Details

- Order of administration is IMPORTANT
 - Why is Planning first and Successive last?
- All subtests have Demonstration and Example items to explain the demands of the subtest
- 12 subtest Extended Battery
 - If one is spoiled, use pro-rating method
- 8 subtest Core Battery is the first 2 subtests in each of the PASS scales
 - If one of the two is spoiled give the third
- Should you use parts of the CAS2?
 - It is best to measure all four PASS abilities

Expose Example A and say,
 Look at this page (point to the page). Draw a line from the number 1 to the number 2, 2 to 3, 3 to 4, and 4 to 5. Provide help if necessary.
 With Example A still exposed, say,
 I'm going to give you some more of these to do. You should always start from the number 3 (point to the number 3 in the bold box in Example A) and draw a line from one number to the next until you get to the last number (point to the number 5). Work as quickly as you can without making a mistake, and tell me when you're finished.
 Ready? (Provide a brief explanation if necessary.)

Provide Help option is unique to CAS2. This allows the examiner the freedom to explain the task in any manner to be sure the student understands what they need to do.

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Ideas to Consider

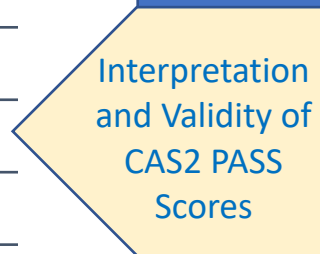
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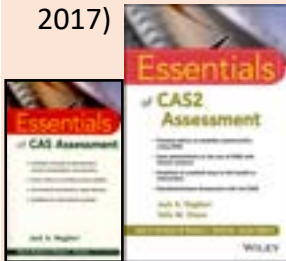
Closing remarks



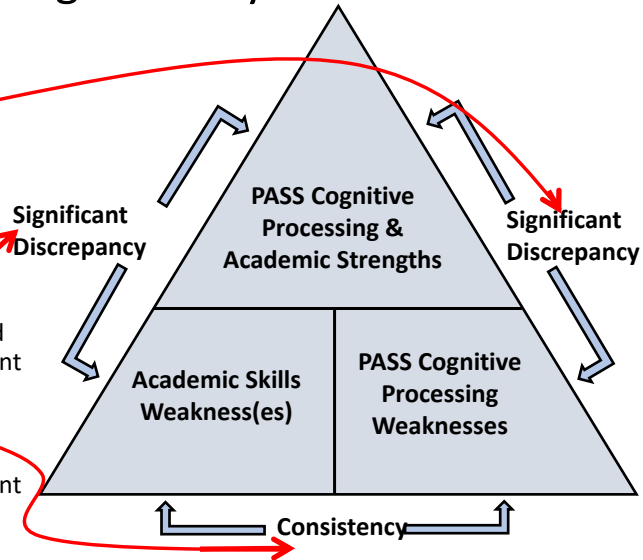
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Discrepancy Consistency Method (DCM) For Identification of a Learning Disability

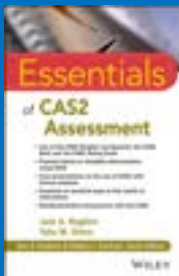
- The Discrepancy Consistency Method was first introduced in 1999 (most recently in 2017)



- Discrepancy between high and low processing scores
- Discrepancy between high processing and low achievement
- Consistency between low processing and low achievement

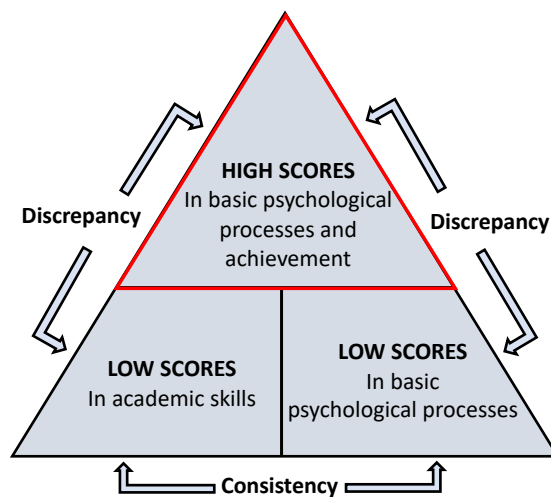


Discrepancy Consistency Method for SLD Determination Naglieri & Otero (2017) Pattern of Strengths and Weaknesses



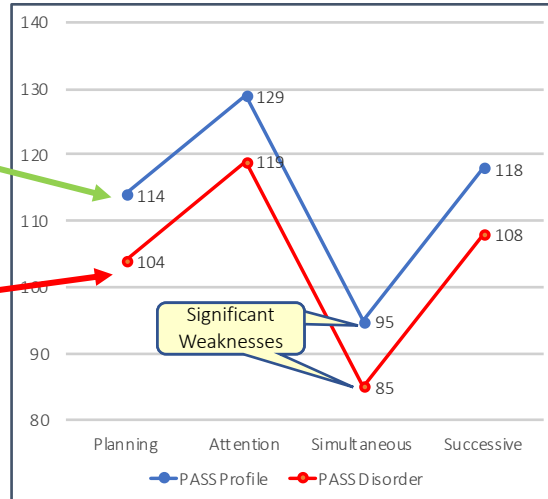
this IS A *Strength Based* Method

Knowing a student's GOOD scores is just as important as knowing their LOW scores



How to Interpret PASS Score Variability

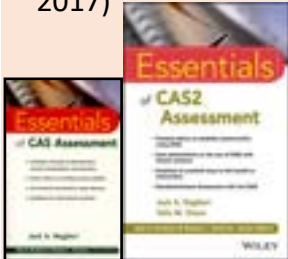
- Two criteria for a disorder
 - Significant variation in relation to student's average has *instructional relevance*
 - Significant variation in relation to student's average **AND** a standard score less than 90 (< 25th %tile) supports designation as SLD



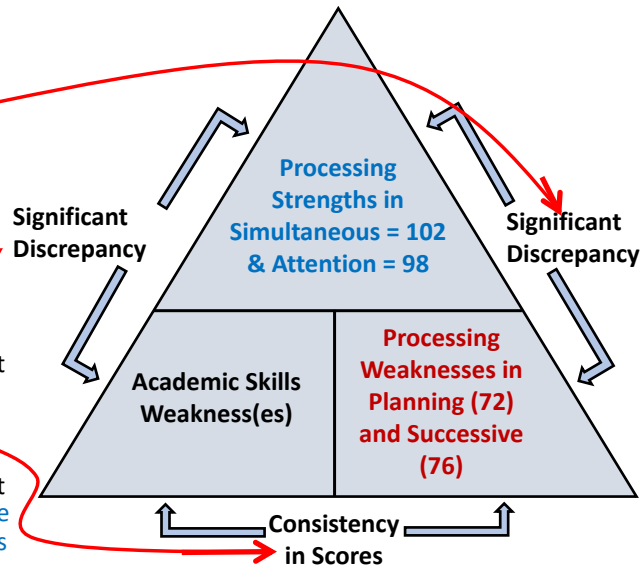
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Answers the Question: Why does the Student Struggle?

- The Discrepancy Consistency Method (DCM) was first introduced in 1999 (most recently in 2017)

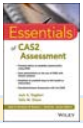


- Discrepancy between high and low processing scores
- Discrepancy between high processing and low achievement
- Consistency between low processing and low achievement explains **WHY** the student struggles



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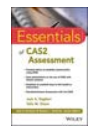


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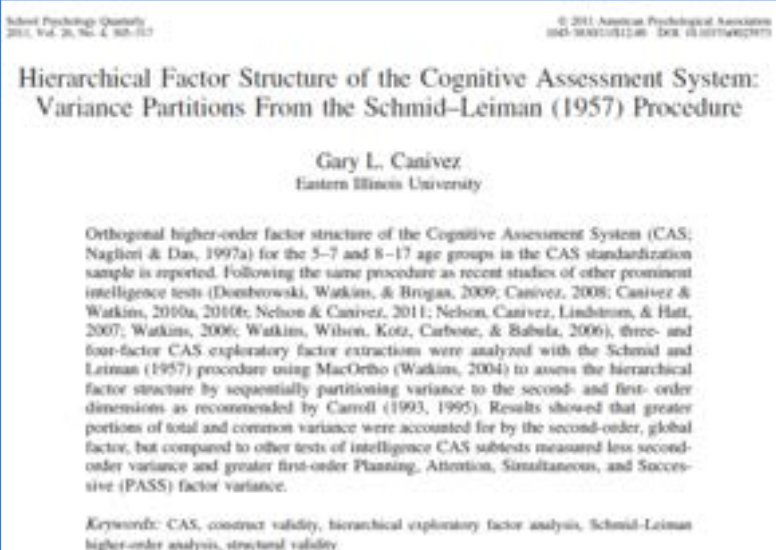
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Hierarchical Factor Structure of the Cognitive Assessment System: Variance Partitions From the Schmid-Leiman (1957) Procedure

Gary L. Canivez
Eastern Illinois University


Orthogonal higher-order factor structure of the Cognitive Assessment System (CAS; Naglieri & Das, 1997a) for the 5–7 and 8–17 age groups in the CAS standardization sample is reported. Following the same procedure as recent studies of other prominent intelligence tests (Dombrowski, Watkins, & Bragan, 2009; Canivez, 2008; Canivez & Watkins, 2010a, 2010b; Nelson & Canivez, 2011; Nelson, Canivez, Lindstrom, & Hatt, 2007; Watkins, 2006; Watkins, Wilson, Kotz, Carbone, & Babula, 2006), three- and four-factor CAS exploratory factor extractions were analyzed with the Schmid and Leiman (1957) procedure using MacOrdo (Watkins, 2004) to assess the hierarchical factor structure by sequentially partitioning variance to the second- and first-order dimensions as recommended by Carroll (1993, 1995). Results showed that greater portions of total and common variance were accounted for by the second-order, global factor, but compared to other tests of intelligence CAS subtests measured less second-order variance and greater first-order Planning, Attention, Simultaneous, and Successive (PASS) factor variance.

Keywords: CAS, construct validity, hierarchical exploratory factor analysis, Schmid-Leiman higher-order analysis, structural validity.

Support for PASS Scales

- “...compared to the WISC–IV, WAIS–IV, SB–5, RIAS, WASI, and WRIT, the CAS subtests had less variance apportioned to the higher-order general factor (g) and *greater proportions of variance apportioned to first-order (PASS...) factors.*”
- This is consistent with the subtest selection and construction in an attempt to measure PASS dimensions linked to PASS theory ... and neuropsychological theory (Luria).” (p. 311)


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Structural validity of the Wechsler Intelligence Scale for Children-Fifth Edition: Confirmatory factor analyses with the 16 primary and secondary subtests.

Canivez, Gary L., Watkins, M. W., & Dombrowski, S. C. (2017). Structural validity of the Wechsler Intelligence Scale for Children-Fifth Edition: Confirmatory factor analyses with the 16 primary and secondary subtests. *Psychological Assessment*, 29(4), 488-472. <https://doi.org/10.1037/xap0000028>

Support for ‘g’



- ...The small portions of variance uniquely captured by [subtests]... render the group factors [scales] of questionable interpretive value independent of g (FSIQ general intelligence)
- Present CFA results confirm the EFA results (Canivez, Watkins, & Dombrowski, 2015); Dombrowski, Canivez, Watkins, & Beaujean (2015); and Canivez, Dombrowski, & Watkins (2015).

➤ The results of this study indicate that most **cognitive abilities specified in John Carroll's three-stratum theory have little-to-no interpretive relevance** above and beyond that of general intelligence.

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Research Supports 'g' but little More

Benson, N. F., Beaujean, A. A., McGill, R. J., & Dombrowski, S. C. (2018). Revisiting **Carroll's Survey of Factor-Analytic Studies**: Implications for the Clinical Assessment of Intelligence. *Psychological Assessment*, 30, 8, 1028–1038.

Canivez, G. L., Watkins, M. W., & Dombrowski, S. C. (2017). Structural validity of the **Wechsler Intelligence Scale for Children–Fifth Edition**: Confirmatory factor analyses with the 16 primary and secondary subtests. *Psychological Assessment*, 29, 458–472.

Canivez, G. L., & McGill, R. J. (2016). Factor structure of the **Differential Ability Scales–Second Edition**: Exploratory and hierarchical factor analyses with the core subtests. *Psychological Assessment*, 28, 1475–1488. <http://dx.doi.org/10.1037/pas0000279>

Canivez, G. L., & McGill, R. J. (2016). Factor structure of the **Differential Ability Scales–Second Edition**: Exploratory and hierarchical factor analyses with the core subtests. *Psychological Assessment*, 28, 1475–1488. <https://doi.org/10.1037/pas0000279>

Canivez, G. L. (2008). Orthogonal higher order factor structure of the **Stanford-Binet Intelligence Scales–Fifth Edition** for children and adolescents. *School Psychology Quarterly*, 23, 533–541.

Dombrowski, S. C., **Canivez, G. L.**, & Watkins, M. W. (2017, May). Factor structure of the 10 **WISC–V** primary subtests across four standardization age groups. *Contemporary School Psychology*. Advance online publication.

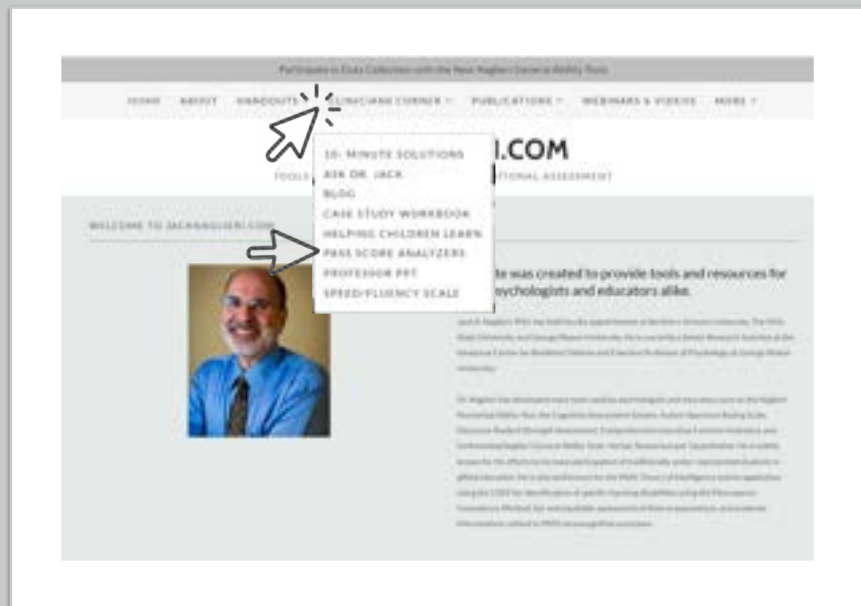
Dombrowski, S. C., McGill, R. J., & Canivez, G. L. (2017). Exploratory and hierarchical factor analysis of the **WJ IV Cognitive** at school age. *Psychological Assessment*, 29, 394–407.

McGill, R. J., & **Canivez, G. L.** (2017, October). Confirmatory factor analyses of the **WISC–IV Spanish** core and supplemental Subtests: Validation evidence of the Wechsler and CHC models. *International Journal of School and Educational Psychology*. Advance online publication.

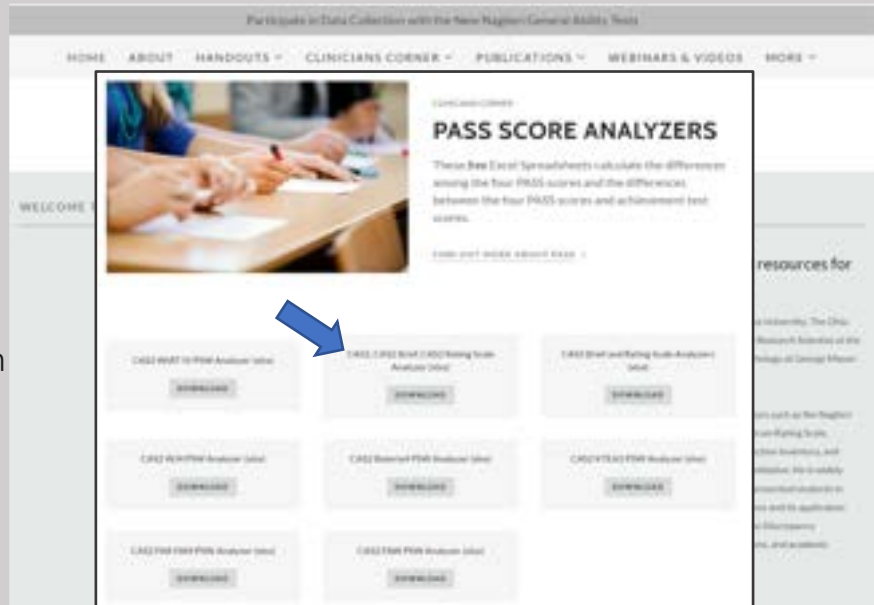
Watkins, M. W., Dombrowski, S. C., & **Canivez, G. L.** (2017, October). Reliability and factorial validity of the **Canadian Wechsler Intelligence Scale for Children–Fifth Edition**. *International Journal of School and Educational Psychology*.

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Interpretive
Aids on
jacknaglieri.com



Interpretive Aids on jacknaglieri.com



12 subtest version ages 5-7

Free PASS Score Analyzer @ jacknaglieri.com

12 subtest version ages 8-18

For CAS2, CAS2: Brief & CAS2: Rating Scale

Differences Between PASS Scale Standard Scores and the Student's Average PASS Score Required for Significance at $p = .05$ and $p = .01$ for the CAS2 12-Subtest EXTENDED-Rettery MSB 5-7 Years

PASS Scales	Standard Score	Difference from PASS Mean of	Significantly Different (at $p = .05$) from PASS Mean?	Strength or Weakness	Significantly Different (at $p = .01$) from PASS Mean?	Strength or Weakness
Planning						
Simultaneous						
Attention						
Successive						

Note: Strengths and weaknesses are based on having a low PASS score (positive comparison at the .05 and .01 levels of significance) and PASS scores that are below 90 (2SD percentile).

Differences Between PASS Scale Standard Scores and the Student's Average PASS Score Required for Significance at $p = .05$ and $p = .01$ for the CAS2 12-Subtest EXTENDED-Rettery MSB 8-18 Years

PASS Scales	Standard Score	Difference from PASS	Significantly Different (at $p = .05$) from PASS Mean?	Strength or Weakness	Significantly Different (at $p = .01$) from PASS Mean?	Strength or Weakness
Planning	72	-15.0	yes	Weakness	yes	Weakness
Simultaneous	102	15.0	yes		yes	
Attention	86	10.0	yes		yes	
Successive	76	-11.0	yes	Weakness	yes	Weakness

Notes:
 1. A Weakness is defined as PASS standard score that is significantly below the child's average PASS score (positive comparison at the .05 level) and the PASS score is below 90 (i.e. below the Average range).
 2. A Strength is defined as PASS standard score that is significantly above the child's average PASS score (positive comparison at the .05 level) and the PASS score is above 100 (i.e. above the Average range).
 3. See Essentials of CAS2 Assessment Interpretation Chapter for more details and examples.

Navigation buttons: CAS2 - 12 subtest Extended, CAS2 8-subtest Core, CAS2 Brief, CAS2 Rating Scale

Interventions

Using Plans to Overcome Anxiety
Some children feel very anxious when they approach new situations, and they are not sure what to do.

Graphic Organizers for Connecting and Remembering Information
Remembering and relating information is a common part of learning and doing life. Students are often expected to learn large amounts of new and unfamiliar information. Learning facts requires...

Segmenting Words for Reading/Decoding and Spelling
Decoding a written word requires the person to make sense out of printed letters and words and to translate letter sequences into sounds. This demands understanding the sounds that letters...

Chunking for Reading/Decoding
Reading/decoding requires the student to look at the sequence of the letters in words and understand the organization of specific sounds in order. Some students have difficulty with long sequences of letters and may benefit from instruction that helps them break the word into smaller, more manageable units, called chunks. Sometimes the order of the sounds in a word is more easily remembered if the entire word is broken into these units. These chunks can be combined into...

- Helping Children Learn Intervention Handouts for Use in School and at Home, *Second Edition*
By Jack A. Naglieri, Ph.D., & Eric B. Pickering, Ph.D.,
- Spanish handouts by
- Tulio Otero, Ph.D., &
- Mary Moreno, Ph.D.



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Questions and Thoughts Please



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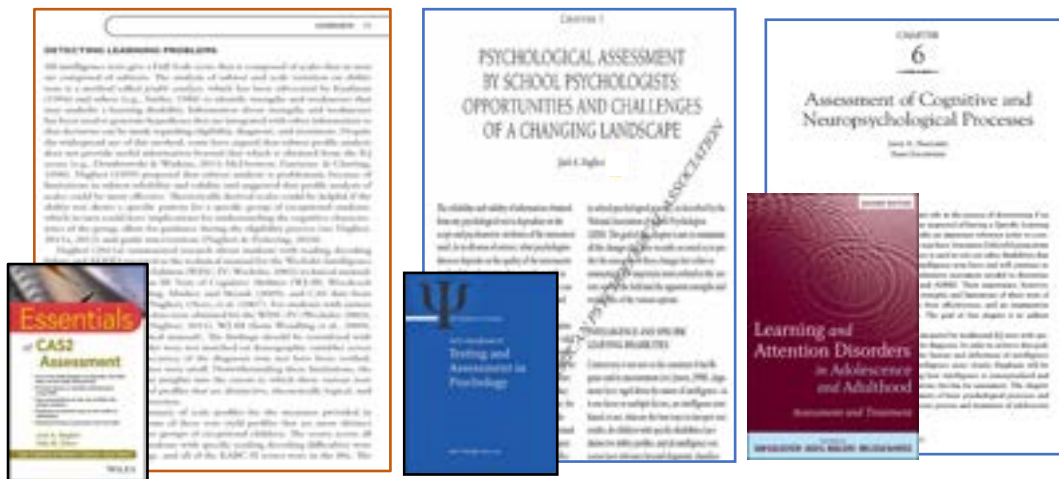
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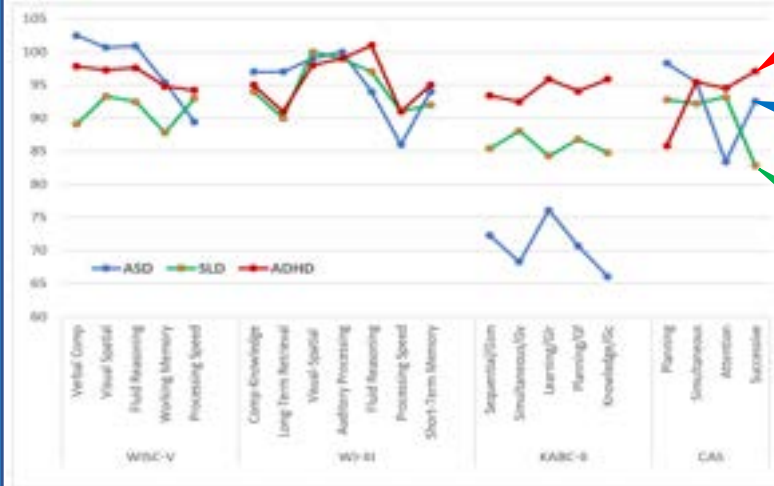
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PASS Profiles: ADHD, Learning Disability & Autism



These profiles across tests suggests: PASS scores show cognitive strengths and weaknesses

Patterns of Strengths & Weaknesses



ADHD - Low Planning

Autism - Low Attention

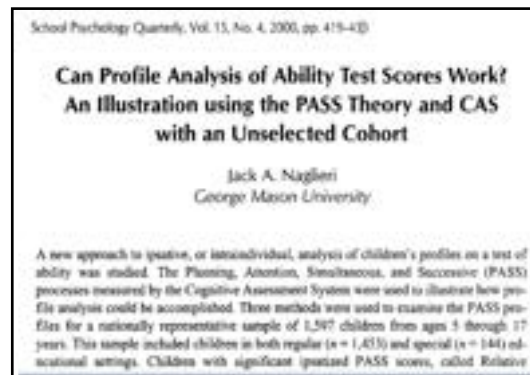
Dyslexia - Low Successive

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Research on PASS Profiles



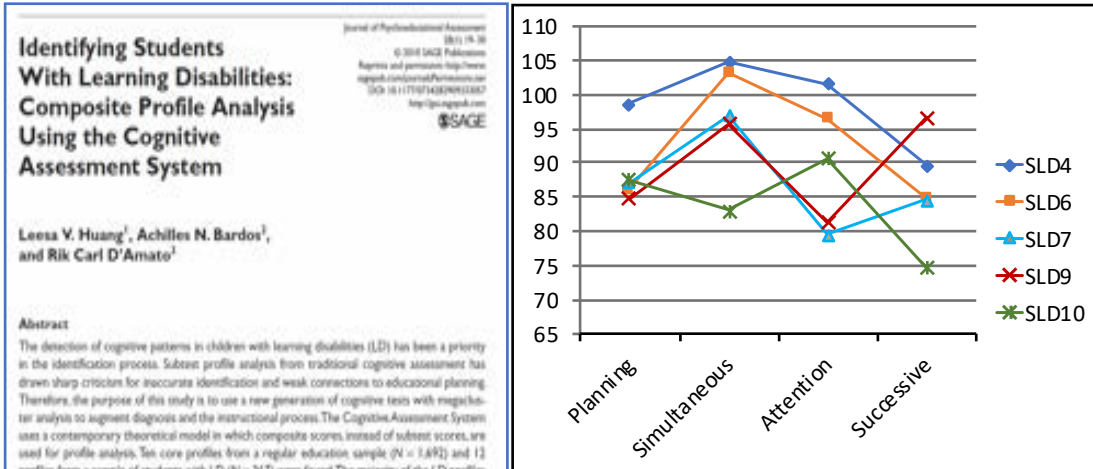
“Ten core profiles from a regular education sample (N = 1,692) and 12 profiles for students with Learning Disability (N = 367).



Students receiving special education were more than four times as likely to have at least one PASS weakness and a comparable academic weakness than those in regular education

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Research on PASS Profiles



Identifying Students With Learning Disabilities: Composite Profile Analysis Using the Cognitive Assessment System

Leesa V. Huang¹, Achilles N. Bardos¹, and Rik Carl D'Amato²

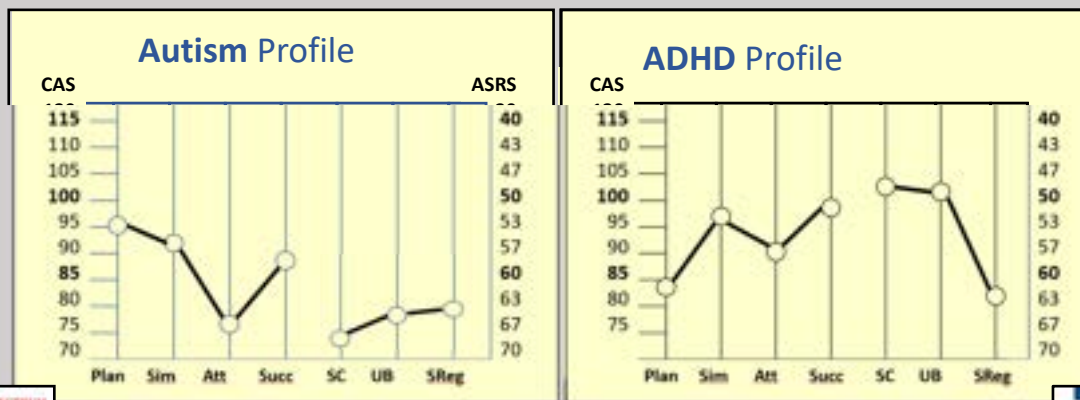
Journal of Psychoeducational Assessment 20(1) 19-30
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 DOI: 10.1177/1532793214269324
<http://jpe.sagepub.com>
 SAGE

Abstract
 The detection of cognitive patterns in children with learning disabilities (LD) has been a priority in the identification process. Subtest profile analysis from traditional cognitive assessment has drawn sharp criticism for inaccurate identification and weak connections to educational planning. Therefore, the purpose of this study is to use a new generation of cognitive tests with regression analysis to augment diagnosis and the instructional process. The Cognitive Assessment System uses a contemporary theoretical model in which composite scores, instead of subtest scores, are used for profile analysis. Ten core profiles from a regular education sample (N = 1,692) and 12 profiles from a sample of students with LD (N = 367) were found. The majority of the LD profiles

“Ten core profiles from a regular education sample (N = 1,692) and 5 profiles from a sample of students with SLD (N = 367) were found.”

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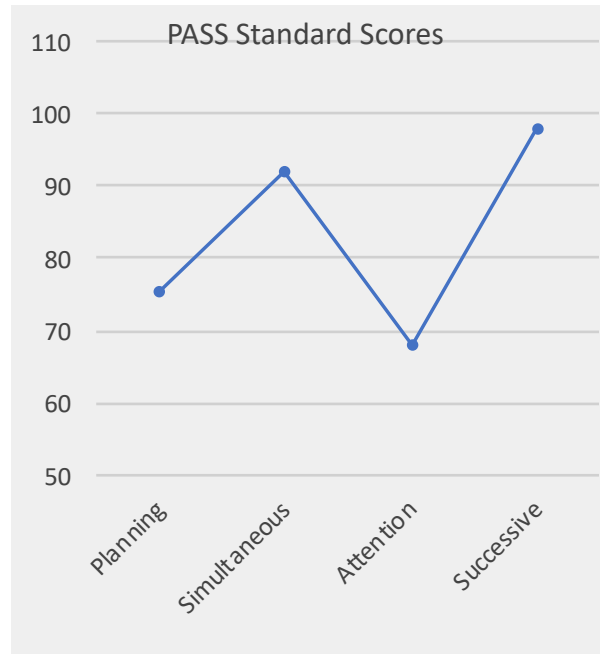
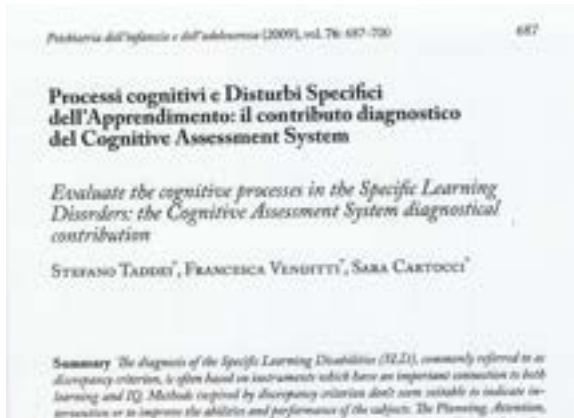
Different ASRS and PASS Profiles for ADHD and ASD



Autism Spectrum Rating Scale (ASRS) and PASS Scale Profiles



ASD - Italy



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An Important Case from Norway


PASS scores from CAS and Autism Spectrum Rating Scale (ASRS) results

- **From school:**
 - 14-Year-old young man has good social functions with certain limits e.g. rigidity. Many interests, but some of them were thought of as childish by his peers.
 - Reading: OK reading, making appropriate progress.
 - Difficulties with multi-syllable-words
 - Difficulties with finding words. Mispronunciations, received services by speech therapist.
- **From parents:**
 - Autism diagnosed at age 7.
 - He has had a great deal of his schooling as 1-1 with a special needs teacher or assistant.
 - In school-years 8-10 a lot of outdoors activities and kitchen work, not so much curriculum content, which the parents think he could benefit from.
 - We met him one year ago, for three days assessment and teaching. Based on this, and the CAS2 and Autism Spectrum Rating Scale from 2018 we completed an evaluation and recommendations for his schooling.

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PASS Scores – Successive Processing Weakness and Social Communication Problems

Scale	T-score (90% CI)	Percentile	Classification	Interpretive Guideline
TOTAL SCORE				
Total Score	52 (49-55)	58	Average Score	No problem indicated
ASRS SCALES				
Social Communication	64 (59-67)	82	Slightly Elevated Score	Has difficulty using verbal and non-verbal communication appropriately to initiate, engage in, and maintain social contact
Unusual Behaviors	54 (50-58)	66	Average Score	No problem indicated
Self-Regulation	37 (34-42)	10	Low Score	No problem indicated



ASRS™

Autism Spectrum Rating Scales (6-18 Years)
Parent Ratings

By Sam Goldstein, Ph.D. & Jack A. Naglieri, Ph.D.

Cognitive Assessment System - 2	Standard Score	Difference from PASS Mean zt	Significantly Different (at p = .05) from PASS Mean?	Strength or Weakness
Planning	59	12.2	yes	
Simultaneous	52	8.8	yes	
Attention	65	2.8	no	
Successive	49	-11.5	yes	Weakness

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PASS Profiles for Gifted Students

Georgiou, G., Dunn, K. & Naglieri, J. A. Neurocognitive Profiles for Students in Gifted Programs: A Pilot Study (2022). *Exceptionality Education International*, 32, 1-13.

- N = 142
 - Similar numbers of girls and boys in Grade 4, 5 and 6.
 - all native speakers of English
 - from middle to upper-middle socioeconomic families
- Gifted definition:
 - “Giftedness is exceptional potential and/or performance across a wide range of abilities in one or more of the following areas: general intellectual, specific academic, creative thinking, social, musical, artistic and kinesthetic” (Alberta Education, 2012, p. 6).
- Tests given
 - WASI –II (Vocabulary and Matrix Reasoning)
 - Woodcock-Johnson III Broad Reading score from: Letter-Word Identification, Reading Fluency, and Passage Comprehension
 - Cognitive Assessment System (CAS; Naglieri & Das, 1997) to measure PASS neurocognitive processes

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A Study of Gifted Students

CAS Full Scale scores correlated significantly higher with WJ-III achievement scores than the WASI-II

PASS scores revealed cognitive weaknesses NOT found with the Wechsler

Table 2
Pearson Correlations of WASI-II FSIQ, Cognitive As

	WASI-II FSIQ	CAS FS
Broad Reading	.24	.53
Broad Math	.34	.50
Mean WJ-III	.34	.62

Table 1
Descriptive Statistics for WASI-II, WJ-III Achievement, and Cognitive Assessment System (CAS) Scores (N = 142)

Variable	Mean	SD	Min	Max
WJ-III Achievement				
Broad Reading	125	14	97	166
Broad Math	116	13	91	162
Mean WJ	117	10	94	152
WASI-II FSIQ	123	8	105	145
CAS Full Scale	118	12	91	148
Planning	110	12	77	146
Simultaneous	121	16	88	152
Attention	113	13	79	141
Successive	111	11	81	137

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A Study of Gifted Students

- 54% of gifted students had a PASS score that was significantly different from that student's average – A strength or weakness
 - This means they have a specific **learning** profile
- 8% had a PASS Weakness
- 4% had a PASS weakness AND similarly low achievement score

Percentages of Gifted Students with Significant Variability in PASS and Achievement Test Scores (N = 142).

		Planning	Simultaneous	Attention	Successive	PASS
PASS <90	n	4	0	4	4	12
	%	3%	0%	3%	3%	8%
PASS & Skills <90	n	3	0	2	1	6
	%	2%	0%	1%	1%	4%

These students have a specific PASS processing weakness less than 90; suggesting **instructional modifications**

These students with low PASS scores AND low achievement suggests a **Learning Disability**

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Profiles Reflect Correlation with Achievement

Average correlations between IQ Scales with total achievement scores from *Essentials of CAS2 Assessment* Naglieri & Otero (2017)



Correlations Between Ability and Achievement			Average Correlation		
Test Scores			All Scales	Scales without achievement	
WISC-V	Verbal Comprehension	.74	.53	.47	
WIAT-III	Visual Spatial	.46			
N = 201	Fluid Reasoning	.40			
	Working Memory	.63			
	Processing Speed	.34			
WJ-IV COG	Comprehension Knowledge	.50	.54	.50	
N = 825	Fluid Reasoning	.71			
	Auditory Processing	.52			
	Short Term Working Memory	.55			
	Cognitive Processing Speed	.55			
	Long-Term Retrieval	.43			
	Visual Processing	.45			
KABC	Sequential/Gsm	.43	.53	.48	
WJ-III ACH	Simultaneous/Gv	.41			
	Learning/Gf	.50			
	Planning/Gf	.59			
CAS	Knowledge/GC	.70	.59		
	WJ-III ACH	Planning			.57
		Simultaneous			.67
N=1,600	Attention	.50			
	Successive	.60			

Note: WJ-IV Scales Comp-Knows Vocabulary and General Information; Fluid Reasoning = Number Series and Concept Formation; Auditory Processing = Phonological processing.

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Georgiou, G., Guo, K., Naveenkumar, N., Vieira, A. P. A., & Das, J. P. (2019) PASS theory of intelligence and academic achievement: A meta-analytic review. *In press Intelligence*.

PASS Research

- “The results clearly show that when CAS Full Scale is used it correlates **.60 with reading** and **.61 with mathematics**.”
- “These correlations are significantly stronger ... than the correlations reported in previous meta-analysis for other measures of intelligence (e.g., Peng et al., 2019; Roth et al., 2015)...(e.g., WISC) that include tasks (e.g., Arithmetic, Vocabulary)...”
- “if we **conceptualize intelligence as ... cognitive processes that are linked to the functional organization of the brain**” it leads to significantly higher relations with academic achievement.”
 - “and these processes have direct implications for instruction and intervention...”

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PASS scores – English and Spanish


Bilingual Hispanic Children's Performance on the English and Spanish Versions of the Cognitive Assessment System
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This study compared the performance of referred bilingual Hispanic children on the Planning, Attention, Simultaneous, Successive (PASS) theory as measured by English and Spanish versions of the Cognitive Assessment System (CAS; Naglieri & Das, 1997a). The results suggest that students scored similarly on both English and Spanish versions of the CAS. Within each version of the CAS, the bilingual children earned their lowest scores in Successive processing regardless of the language in which the scores were noted between the Simultaneous and Successive were similar. Specific children were found to contribute to versions of the CAS. Comparisons on both versions of the study despite the language.

Keywords: bilingual assessment, tests, non-brain assessment

The Neurocognitive Assessment of Hispanic English-Language Learners With Reading Failure

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This study examined the performance of referred Hispanic English-language learners (N = 40) on the English and Spanish versions of the Cognitive Assessment System (CAS; Naglieri & Das, 1997). The CAS measures basic neuropsychological processes based on the Planning, Attention, Simultaneous, and Successive (PASS) theory (Naglieri & Das, 1997). Scores as well as PASS processing scale scores were found in FL scores on in any of English (M = 16.4, SD = 8.72) and Spanish (intermediate) and AN (corrected for sample) in Successive processing regardless of the PASS cognitive profiles were similar on scores. These findings suggest that students and that the CAS may be a useful measure with underdeveloped English-language

- Very similar scores in English and Spanish versions of CAS
- **>90% agreement** between PASS weakness & strengths using English and Spanish CAS in **BOTH** studies

CAS in Italy

Using US norms, Italian sample (N = 809) CAS Full Scale was 100.9 and matched US sample (N = 1,174) was 100.5 and factorial invariance was found



Multigroup Confirmatory Factor Analysis of U.S. and Italian Children's Performance on the PASS Theory of Intelligence as Measured by the Cognitive Assessment System

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This study examined Italian and U.S. children's performance on the English and Italian versions, respectively, of the Cognitive Assessment System (CAS; Naglieri & Das, 2000; Naglieri & Das, 1997), a test based on a neurocognitive theory of intelligence entitled PASS (Planning, Attention, Simultaneous, and Successive; Naglieri & Das, 1997; Naglieri & Das, 2011). CAS subtest, PASS scales, and Full Scale scores for Italian (N = 809) and U.S. (N = 1,174) samples, matched by age and gender, were examined. Multigroup confirmatory factor analysis results supported the configural invariance of the CAS factor structure between Italian and Americans for the 5- to 7-year-old (root mean-square error of approximation [RMSEA] = .038, 90% confidence interval [CI] = .035, .043), comparative fit index [CFI] = .96) and 8- to 18-year-old (RMSEA = .036, 90% CI = .033, .043, CFI = .97) age groups. The Full Scale standard scores (using the U.S. norms) for the Italian (100.9) and U.S. (100.3) samples were nearly identical. The scores between the samples for the PASS scales were very similar, except for the Attention Scale ($\lambda = 0.26$), where the Italian sample's mean score was slightly higher. Negligible mean differences were found for W of the 11 subtest scores, 3 showed small d -ratios (2 in favor of the Italian sample), and 1 was large (in favor of the U.S. sample), but some differences in subtest variances were found. These findings suggest that the PASS theory, as measured by CAS, yields similar mean scores and showed factorial invariance for these samples of Italian and American children, who differ on cultural and linguistic characteristics.

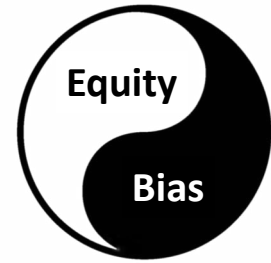
Test Bias vs Test Equity

According to the *Standards for Educational and Psychological Testing* (AERA, APA, NCME, 2014) Psychometric TEST BIAS and EQUITY are two different ways of measuring test fairness.

Equitable Measurement

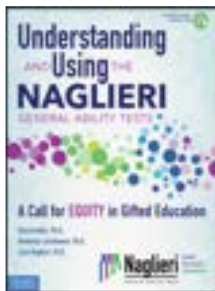


- ... if a person has had limited opportunities to learn the content in a test of intelligence, **that test may be considered unfair** (because it penalizes students for not knowing the answers) **even if the norming data do not demonstrate test bias.**
- Evidence of EQUITY is examined by test content and mean score differences



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Race and Ethnic Differences by Ability Test



Traditional and 2nd-Generation Ability Tests

	By Race	By Ethnicity
Tests that require knowledge	Mn = 9.5	Mn = 5.2
Otto-Lennon School Ability Test (district wide)	13.6	
Stanford-Binet IV (normative sample)	12.6	
WISC-V (normative sample)	11.6	
WI-III (normative sample)	10.9	10.7
CogAT7 (Nonverbal scale)	11.8	7.6
CogAT7 - Verbal	6.6	5.3
CogAT7 - Quantitative	5.6	3.6
CogAT - Nonverbal	6.4	2.9
CogAT-Total (V, Q & NV)	7.0	4.5
WISC-V (statistical controls normative sample)	8.7	
Tests that require minimal knowledge	Mn = 4.3	Mn = 2.8
K-ABC (normative sample)	7.0	
K-ABC (matched samples)	6.1	
KABC-II (adjusted for gender & SES)	6.7	5.4
CAS-2 (normative sample)	6.3	4.5
CAS (statistical controls normative sample)	4.8	4.8
CAS-2 (statistical controls normative sample)	4.3	1.8
CAS-2 Brief (normative samples)	2.0	2.8
NNAT (matched samples)	4.2	2.8
Naglieri General Ability Test-Verbal	2.2	1.6
Naglieri General Ability Test-Nonverbal	1.0	1.1
Naglieri General Ability Test-Quantitative	3.2	1.3

See Brulles, D., Lansdowne, K. & Naglieri, J. A. (2022). *Understanding and Using the Naglieri General Ability Tests: A Call to Equity in Gifted Education*. Minneapolis, MN: Free Spirit Publishing for more details.

Note: Even though a test may not show psychometric bias those tests with academic content that show large mean score differences are not equitable and are unfair.

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Instructional Implications will be Provided

Kryza and Naglieri will unite PASS theory with Practical Methods that can be used to improve learning

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Your Thoughts and Questions

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Ideas to Consider

Description of the CAS2

Interpretation Aids

Research Summary

Interpretation Details

Closing remarks



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Summary: PASS theory and CAS2 (see Naglieri & Otero, 2017)

1. The PASS scales on the CAS2 measure *thinking* (i.e. basic psychological processing) rather than *knowing* (e.g., vocabulary, arithmetic etc.), making the test good for assessment of diverse populations and those with limited educational opportunity.
2. PASS scores can be easily obtained in 20 minutes (using the 4-subtest **CAS2 Brief**), 40 minutes (using the **8-subtest Core Battery**) or 60 minutes (using the **12-subtest Extended Battery**), scored and a narrative reports provided using the **online program**. (Digital CAS2 is in final stages of development.)
3. PASS results are easy for teachers, parents and the students themselves to understand because the concepts can be explained in non-technical language.
4. The PASS theory and the CAS2 provide a way to both define and assess 'basic psychological processes' so that practitioners can obtain scores that are consistent with state and federal IDEA guidelines.
5. The PASS scores are strongly correlated to achievement, show distinct patterns of strengths and weaknesses, are very useful for intervention planning.
6. The CAS2 provides defensible Discrepancy Consistency Method to identify students with SLD.
7. Research has shown that PASS scores have relevance to instruction and intervention.

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The graphic is divided into two main sections. The left section has a maroon background with the text "FINAL THOUGHTS!" in large, light green, stylized letters. Below this, the word "dreamtime" is written in a smaller, white, lowercase font. At the bottom of this section, there are ten colorful poles of varying heights, each with a hand reaching up from the top. The poles are colored in shades of grey, green, blue, purple, and teal. The right section has a black background with a large, glowing red question mark in the center.

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