Neurocognitive Profiles for 2E Gifted Students with Dyslexia, Autism and ADHD: Implications for Assessment and Instruction

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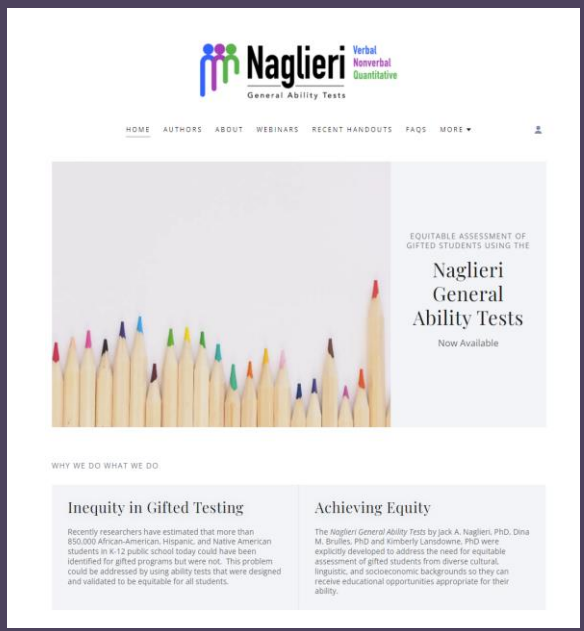
FOR MORE INFORMATION PLEASE GO TO MY WEB PAGES



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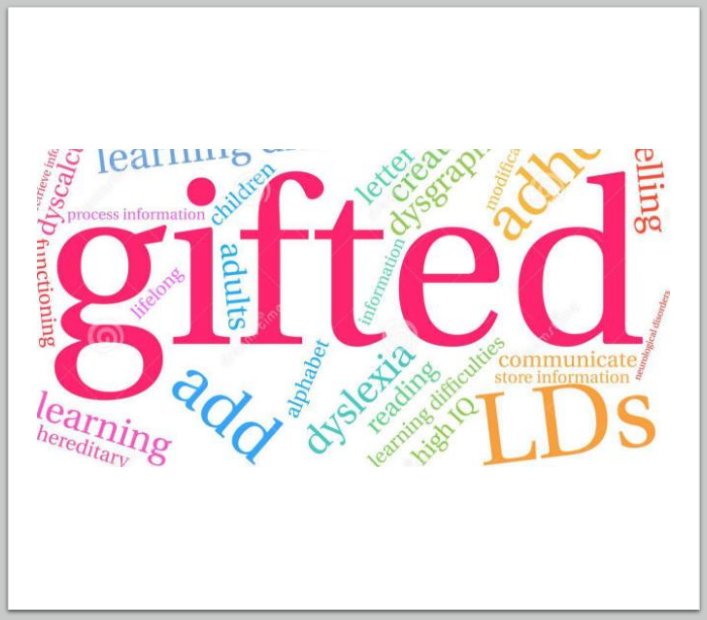
Disclosures

3

Welcome

Twice exceptional gifted students..

- with Specific Learning Disabilities (SLD)
- Attention Deficit Hyperactivity Disorder (ADHD)
- Autism Spectrum Disorders (ASD)
- These are '*Neurodiverse*' students



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Gifted with a Disability

- Identification of gifted students with a disability demands consideration of guidelines found in the *DSMV* for Attention Deficit Disorder and Autism Spectrum disorder and *IDEA* for Specific Learning Disabilities.
- These students are better understood when we know their neurocognitive abilities as defined by the PASS theory
- We will examine PASS and behavioral patterns of strengths and weaknesses for these three groups

5

Specific Learning Disability Assessment

Why measure 'basic psychological processes'

6

Gifted Students with Disabilities

- Twice exceptional, or 2E, refers to intellectually gifted children who have a **specific learning disability** (e.g., dyslexia), Attention Deficit Hyperactivity Disorder (ADHD), or autism spectrum disorder (ASD).

- Specific learning disability assessment involves intellectual and academic assessment typically by a school or private psychologist

"(30) SPECIFIC LEARNING DISABILITY.—
"(A) IN GENERAL.—The term 'specific learning disability' means a disorder in 1 or more of the basic psychological processes involved in understanding or in using language, spoken or written, which disorder may manifest itself in the imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations.
"(B) DISORDERS INCLUDED.—Such term includes such conditions as perceptual disabilities, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia.
"(C) DISORDERS NOT INCLUDED.—Such term does not include a learning problem that is primarily the result of visual, hearing, or motor disabilities, of mental retardation, of emotional disturbance, or of environmental, cultural, or economic disadvantage.

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NIH-funded study finds dyslexia is not tied to IQ (2011)

- Research on brain activity fails to support widely used ability/achievement discrepancy approach to identify students with dyslexia.
- Regardless of high or low overall scores on an IQ test, children with dyslexia show similar patterns of brain activity.
- The results call into question the discrepancy model — the practice of classifying a child as dyslexic on the basis of a DISCREPANCY between reading ability and overall IQ scores.

https://www.nih.gov/news-events/news-releases/nih-funded-study-finds-dyslexia-not-tied-iq

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Efforts to Identify Gifted Students (2018)

- 'NAGC recommends …using WISC-V expanded and ancillary index scores … to document giftedness …patterns of strengths and weaknesses for twice exceptional children and ensure that gifted programs are accessible to children with disabilities'

NATIONAL ASSOCIATION FOR Gifted Children

Position Statement
(Approved August 2018)

Use of the WISC-V for Gifted and Twice Exceptional Identification
Recommendations for Use

In comprehensive assessment of gifted and twice exceptional children, the WISC-V Full Scale IQ score should **not** be required. The Full Scale score may be disadvantageous for such students and may impede efforts to ensure that gifted classrooms, programs, and schools are accessible to children with disabilities.

Instead, NAGC recommends that any one of the following WISC-V scores (subtests in parentheses), should be acceptable for use in the selection process for gifted programs if it falls within the confidence interval of the required score for admission:

- the **Verbal (Expanded Crystallized) Index (VECI)** (SI, VC, IN and CO),
- the **Nonverbal Index (NVI)** (BD, MR, CD, FW, VP, and PS),
- the **Expanded Fluid Index (EFI)** (MR, FW, PC, and AR),
- the **General Ability Index (GAI)** (BD, SI, MR, VC and FW),
- the **Full Scale IQ Score (FSIQ)** (BD, SI, MR, DS, CD, VC, and FW), and/or
- the **Expanded General Ability Index (EGAI)** (SI, VC, IN, CO, BD, MR, FW and AR).

The **Quantitative Reasoning Index (QRI)** (FW and AR) serves as a good indicator of mathematical talent.

Information about scores is available in test manuals and WISC-V Technical Reports #1 and 5.

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Support for Scales, Subtests or 'g'?

Journal Information
Journal TOC

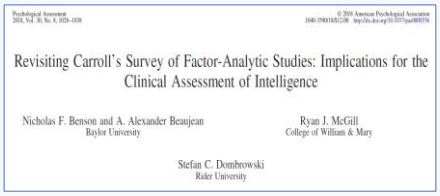
PsycARTICLES: Journal Article

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

© Request Permissions

Canivez, Gary L.,Watkins, Marley W.,Dombrowski, Stefan C.
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*(4), 458–472.
https://doi.org/10.1037/pas0000358

- …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).



Revisiting Carroll's Survey of Factor-Analytic Studies: Implications for the Clinical Assessment of Intelligence

Nicholas F. Benson and A. Alexander Beaujean
Baylor University

Ryan J. McGill
College of William & Mary

Stefan C. Dombrowski
Rider University

- **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

Watkins, M. W., & Canivez, G. L. (2021). Assessing the psychometric utility of IQ scores: A tutorial using the Wechsler intelligence scale for children–fifth edition. School Psychology Review, 1-15.

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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Alternatives to Traditional Intelligence Tests ?

Wechsler, Binet, CHC, OLSAT, CogAT

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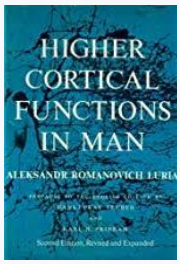
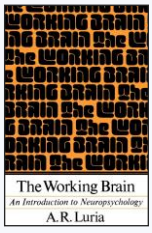
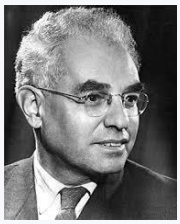
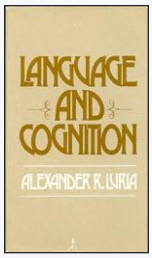
Luria's Explanation of Brain Function









- **P**lanning = DECIDING HOW TO DO WHAT YOU DECIDE TO DO
- **A**ttention = BEING ALERT AND RESISTING DISTRACTIONS
- **S**imultaneous = GETTING THE BIG PICTURE
- **S**uccessive = FOLLOWING A SEQUENCE

PASS theory can be used to define **NEURODIVERSITY**

These are easy to understand definitions of basic psychological processes that are measured with the Cognitive Assessment System – Second Edition

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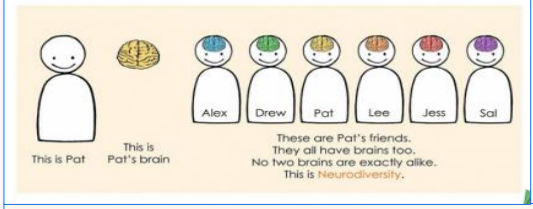
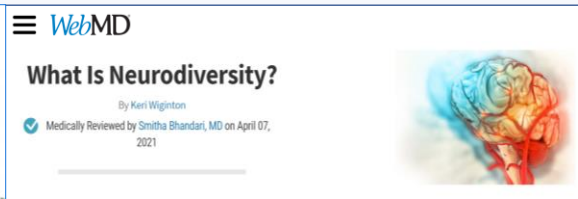
Neurodiversity Defined





What would happen if the world viewed neurodevelopmental differences like ADHD, autism, and learning disabilities differently? If everyone noticed the *strengths* that can come from these differences first, instead of the challenges?

'Neurodiversity' is a concept that implies that neurological difference is best understood as an inherent and valuable part of the range of human variation, rather than a pathological form of difference. Dyck E., Russell G. (2020) Challenging Psychiatric Classification: Healthy Autistic Diversity and the Neurodiversity Movement. In: Taylor S., Brumby A. (eds) Healthy Minds in the Twentieth Century. Mental Health in Historical Perspective. Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-030-27275-3_8

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PASS Theory Based on Brain Function (see Naglieri & Otero, 2017)

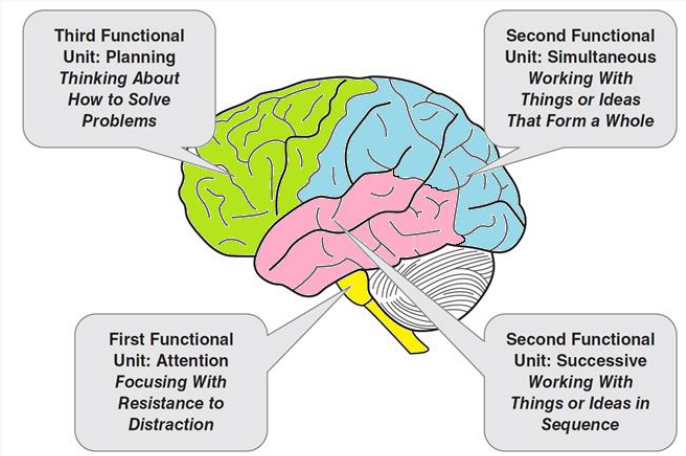

Figure 1.2 Three Functional Units and Associated Brain Structures

From: *Essentials of CAS2 Assessment*. Naglieri & Otero, 2017

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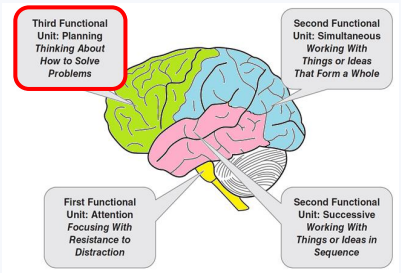
PASS Theory: Planning

- **Planning** is a neurocognitive ability that a person uses to determine, select, and use efficient solutions to problems
  - problem solving
  - developing plans and using strategies
  - retrieval of knowledge
  - impulse control and self-control
  - control of processing
- Planning tests measure Executive Function



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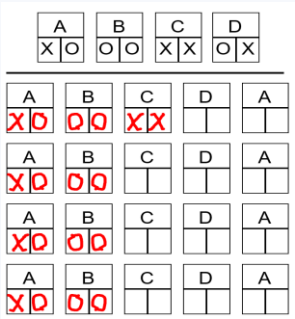

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PASS Theory: Attention

- Attention is a basic psychological process we use to attend to some stimuli and ignore others
  - Focus our cognitive activity
  - Selective attention
  - Resistance to distraction
  - Listening, as opposed to hearing
- All academic tasks demand attention but some more than others

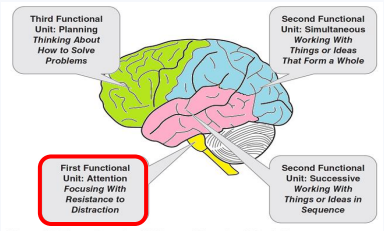

Figure 1.2 Three Functional Units and Associated Brain Structures

From: *Essentials of CAS2 Assessment.* Naglieri & Otero, 2017

RED	RED	BLUE
YELLOW	YELLOW	RED
BLUE	RED	YELLOW
BLUE	BLUE	BLUE

17

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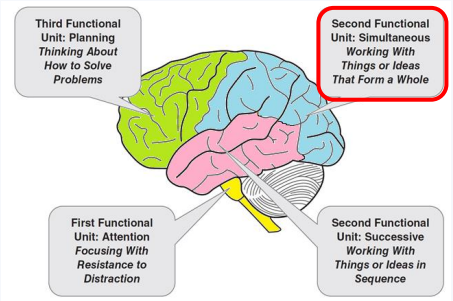
PASS Theory: Simultaneous

- **Simultaneous** processing is used to integrate stimuli into groups
  - Each piece must be related to the other
  - Stimuli are seen as a whole
- Academics:
  - Reading comprehension
  - geometry
  - math word problems
  - whole language
  - verbal concepts



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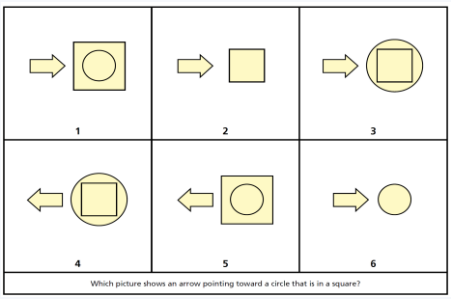

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PASS Theory: Successive

- **Successive** processing is a basic psychological process we use to manage stimuli in a specific serial order
  - Stimuli form a chain-like progression
  - Recall a series of words
  - Decoding words
  - Letter-sound correspondence
  - Phonological tasks
  - Understanding the syntax of sentences
  - Comprehension of written instructions

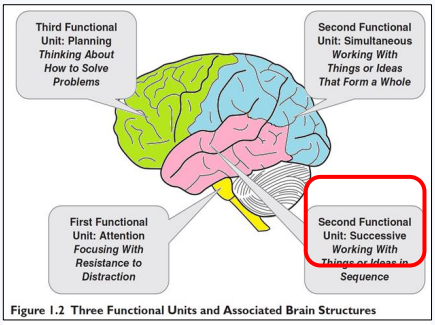

Figure 1.2 Three Functional Units and Associated Brain Structures

From: *Essentials of CAS2 Assessment*. Naglieri & Otero, 2017

Recall of Numbers in Order
Successive Processing

4 3 8 6

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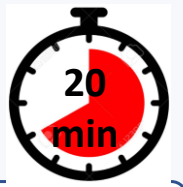
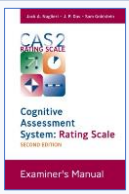
How to Measure PASS with CAS2

- **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 soon



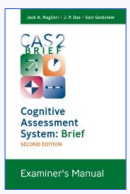
CAS2 Rating Scale
(4 subtests)

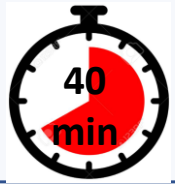
Total Score
Planning
Simultaneous
Attention
Successive



CAS2 Brief
(4 subtests
20 minutes)

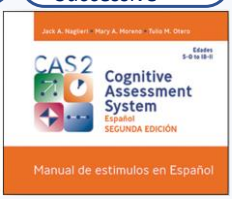
Total Score
Planning
Simultaneous
Attention
Successive





CAS2 Core
(8 subtests
40 minutes)

Full Scale
Planning
Simultaneous
Attention
Successive



CAS2 Extended
(12 subtests
60 minutes)

Full Scale
Planning
Simultaneous
Attention
Successive
Supplemental Scales
Executive Function
Working Memory
Verbal / Nonverbal
Visual / Auditory
Speed / Fluency

CAS2 Digital (English & Spanish) coming in 2022

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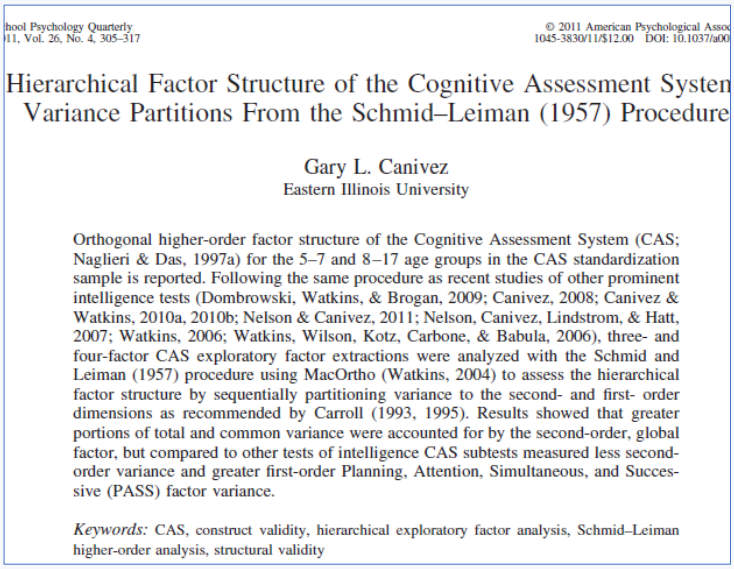

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11, Vol. 26, No. 4, 305–317

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1045-3830/11/$12.00 DOI: 10.1037/a00

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, & Brogan, 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 MacOrtho (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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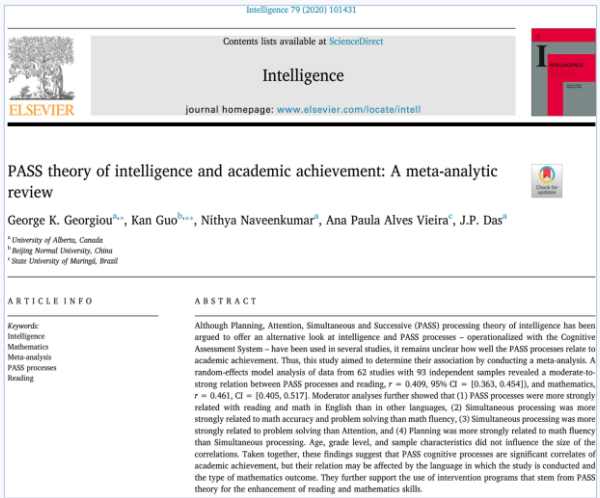

Intelligence 79 (2020) 101431

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journal homepage: www.elsevier.com/locate/intell

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PASS theory of intelligence and academic achievement: A meta-analytic review

George K. Georgiou[a,*], Kan Guo[b,**], Nithya Naveenkumar[a], Ana Paula Alves Vieira[c], J.P. Das[a]

[a] University of Alberta, Canada
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[c] State University of Maringá, Brazil

ARTICLE INFO

Keywords:
Intelligence
Mathematics
Meta-analysis
PASS processes
Reading

ABSTRACT

Although Planning, Attention, Simultaneous and Successive (PASS) processing theory of intelligence has been argued to offer an alternative look at intelligence and PASS processes – operationalized with the Cognitive Assessment System – have been used in several studies, it remains unclear how well the PASS processes relate to academic achievement. Thus, this study aimed to determine their association by conducting a meta-analysis. A random-effects model analysis of data from 62 studies with 93 independent samples revealed a moderate-to-strong relation between PASS processes and reading, $r = 0.409$, 95% CI = [0.363, 0.454]), and mathematics, $r = 0.461$, CI = [0.405, 0.517]. Moderator analyses further showed that (1) PASS processes were more strongly related with reading and math in English than in other languages, (2) Simultaneous processing was more strongly related to math accuracy and problem solving than math fluency, (3) Simultaneous processing was more strongly related to problem solving than Attention, and (4) Planning was more strongly related to math fluency than Simultaneous processing. Age, grade level, and sample characteristics did not influence the size of the correlations. Taken together, these findings suggest that PASS cognitive processes are significant correlates of academic achievement, but their relation may be affected by the language in which the study is conducted and the type of mathematics outcome. They further support the use of intervention programs that stem from PASS theory for the enhancement of reading and mathematics skills.

Georgiou, G., Guo, K., Naveenkumar, N., Vieira, A. P. A., & Das, J. P. (2020) PASS theory of intelligence and academic achievement: A meta-analytic review.

PASS Meta-Analysis

- "The CAS Full Scale 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 … PASS processes … linked to 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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Race and Ethnic Differences by Ability Test

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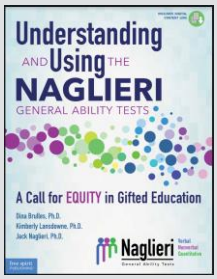
Intelligence Test Mean Standard Score Differences by Race and Ethnicity.		
	Race	Ethnicity
Tests that require knowledge	**11.5**	**9.2**
Otis-Lennon School Ability Test (school system)	13.6	
Stanford-Binet IV (normative sample)	12.6	
WISC-V (normative sample)	11.6	
WJ- III (normative sample)	10.9	10.7
CogAT7 (Nonverbal scale)	11.8	7.6
WISC-V (statistical controls normative sample)	8.7	
Tests that require minimal knowledge	**3.5**	**2.6**
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

From: 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.

Tests that demand academic knowledge

Tests that do NOT demand academic knowledge



Note: Even though traditional intelligence tests may not show psychometric bias (Worrell, 2019) the large mean score differences suggest they are unfair (Brulles, et al., 2022).

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How to use PASS Neurocognitive Theory to Identify a Student with a Specific Learning Disability

SLD Identification should MATCH IDEA definition

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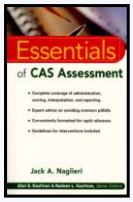
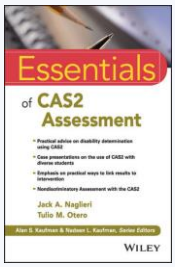
Discrepancy Consistency Method (DCM)

- …first introduced in 1999 and most recently in 2017





jnaglieri@gmail.co

Pattern of Strengths and Weaknesses Using the Discrepancy/Consistency Method for SLD Determination

Three methods for detecting a pattern of strengths and weaknesses (PSW) that can be used as part of the process of identifying a student with a specific learning disability (SLD) have been suggested by Naglieri in 1999, Hale and Fiorello in 2004, and by Flanagan, Ortiz, and Alfonso in 2007. These authors share the same goal: to present a procedure to detect a PSW in scores that can be used to identify an SLD (sometimes referred to as a third option; Zirkel & Thomas, 2010). Despite differences in the composition of the scores used and the definitions of what constitutes a basic psychological process, these methods all rely on finding a combination of differences as well as similarities in scores across academic and cognitive tests. Our approach to operationalizing a PSW is called the Discrepancy/Consistency Method (DCM) for the identification of SLD. Determining SLD is essentially based on the combination of PASS and achievement test scores. The method involves a systematic examination of variability of PASS and academic achievement test scores, which has two main ingredients. First, there must be evidence of a PASS cognitive weakness as described in Step 1 of this chapter, and, second, achievement test scores should show substantial variability that aligns with the high and low PASS scores. What

DON'T FORGET 3.5

The essence of the Discrepancy/Consistency Method is two discrepancies and one consistency.

Discrepancy 1:
Significant variability among the PASS scores indicating a weakness in one or more of the basic psychological processes

Discrepancy 2:
Significant difference between high PASS scores and low achievement test scores

Consistency:
No significant difference between low PASS scores and low achievement

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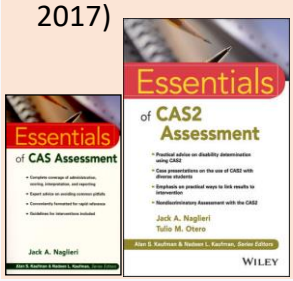
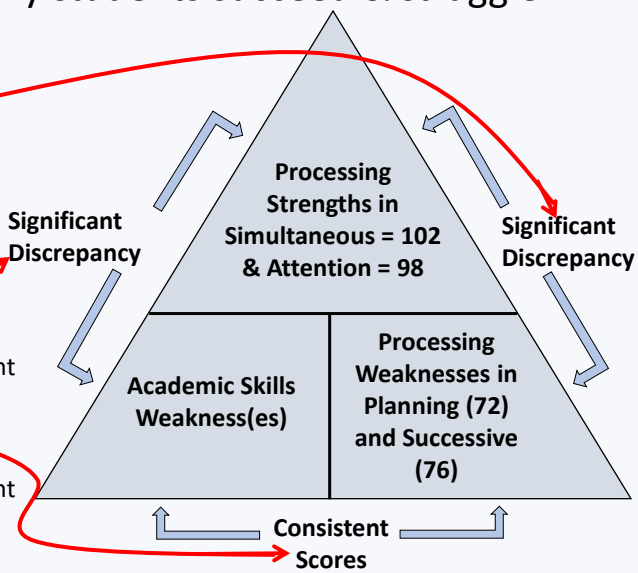
Answering the Question: Why students succeed & struggle

- 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



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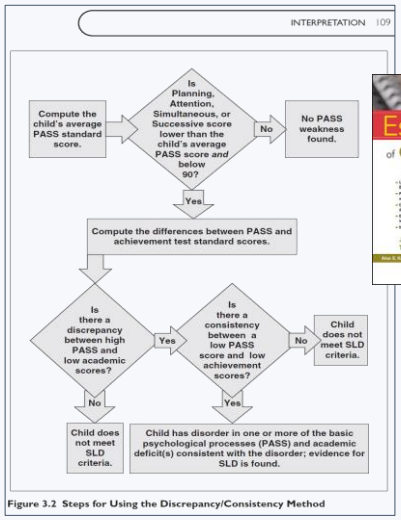
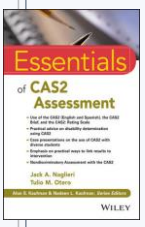
Discrepancy Consistency Method (Naglieri & Otero, 2017)

1. Determine if the PASS scores vary significantly from the examinee's average PASS score and the lowest score is below average (<90) (Table 3.5)
2. Determine if the high PASS scores are significantly different from the low achievement scores (Appendix A-F)
3. Determine if the LOW PASS score is or is not significantly different from the low achievement scores (Appendix A-F)





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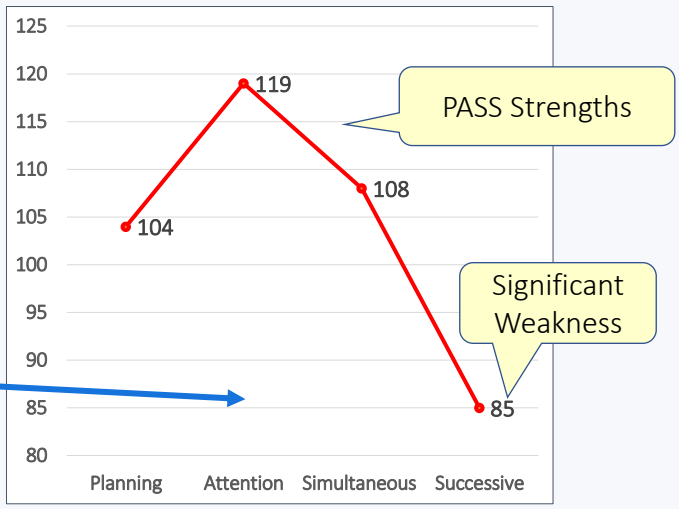
Evidence of a Disorder in Basic Psychological Processes

- PASS scores show significant variability
- Strengths in Planning, Attention and Simultaneous Processing
- Weaknesses in Successive processing
- ***Supports SLD eligibility***



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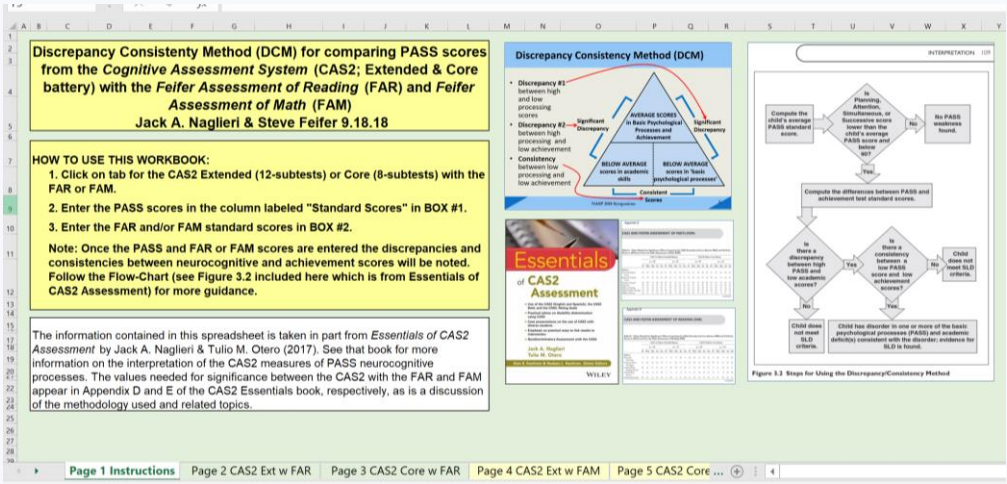
FREE CAS2 PSW Analyzer for FAR, FAM, & FAW, WJ4, KTEA3, WIAT4



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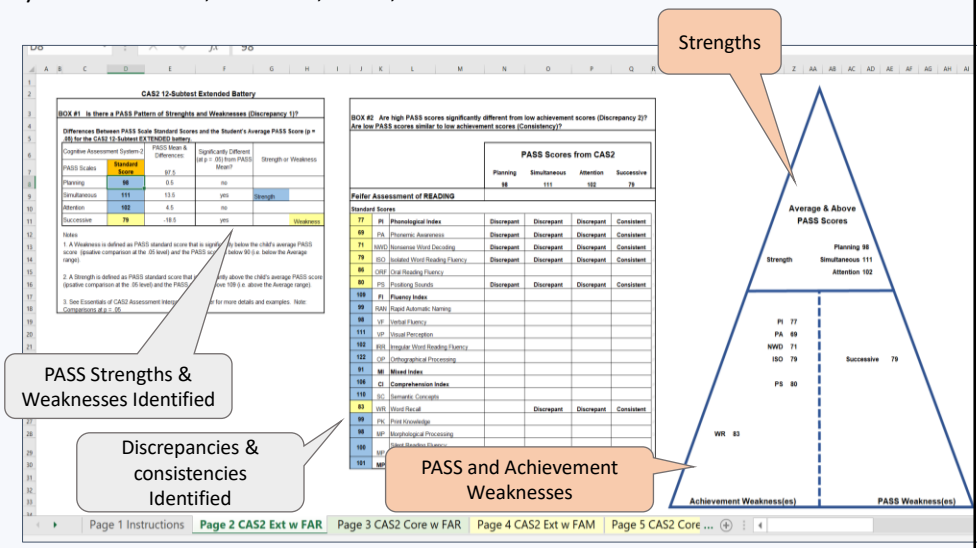
CAS2 PSW Analyzer for WJ4, KTEA3, FAR, FAM

- Enter PASS and Achievement test standard scores and all comparisons are calculated



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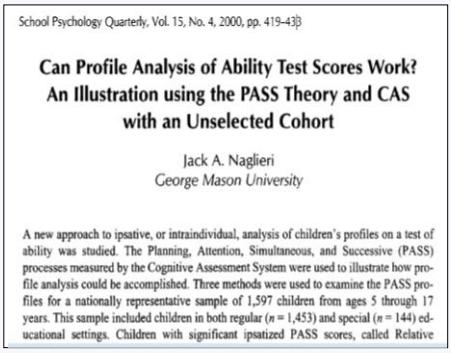
Research on PASS Profiles

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

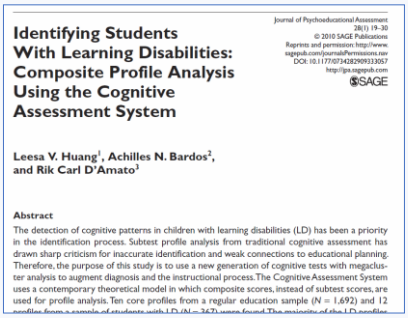


School Psychology Quarterly, Vol. 15, No. 4, 2000, pp. 419–433

Can Profile Analysis of Ability Test Scores Work? An Illustration using the PASS Theory and CAS with an Unselected Cohort

Jack A. Naglieri
George Mason University

A new approach to ipsative, or intraindividual, analysis of children's profiles on a test of ability was studied. The Planning, Attention, Simultaneous, and Successive (PASS) processes measured by the Cognitive Assessment System were used to illustrate how profile analysis could be accomplished. Three methods were used to examine the PASS profiles for a nationally representative sample of 1,597 children from ages 5 through 17 years. This sample included children in both regular (n = 1,453) and special (n = 144) educational settings. Children with significant ipsatized PASS scores, called Relative



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

Journal of Psychoeducational Assessment
28(1) 19–30
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DOI: 10.1177/0734282909333057
http://jpa.sagepub.com
SAGE

Leesa V. Huang[1], Achilles N. Bardos[2], and Rik Carl D'Amato[3]

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 megacluster 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 12 profiles from a sample of students with LD (N = 367) were found.

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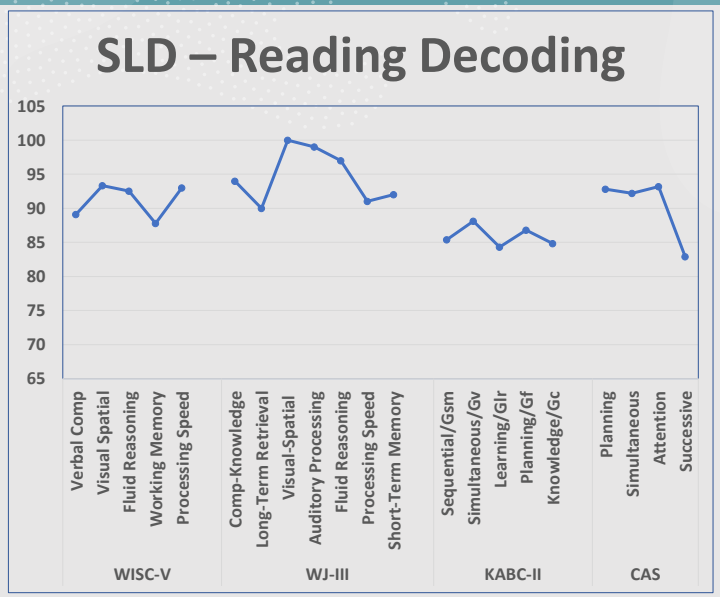
Traditional Intelligence Tests and PASS Cognitive Processing Test Profiles for SLD (Dyslexia)

PASS Profile reveals Successive processing weakness



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ADHD Assessment

'basic psychological processes associated with ADHD'

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Gifted & ADHD

- Twice exceptional, or 2E, refers to intellectually gifted children who have a specific learning disability (e.g., dyslexia), **Attention Deficit Hyperactivity Disorder (ADHD)**, or autism spectrum disorder (ASD).
  - ADHD diagnosis is based on observable behaviors
  - Three types of ADHD are Inattentive, Hyperactive / Impulsive and Combined Type

DSM-5 Diagnostic Criteria for ADHD

Symptoms and/or behaviors that have persisted ≥ 6 months in ≥ 2 settings (e.g., school, home, church). Symptoms have negatively impacted academic, social, and/or occupational functioning. In patients aged < 17 years, ≥ 6 symptoms are necessary; in those aged ≥ 17 years, ≥ 5 symptoms are necessary.	
Inattentive Type Diagnosis Criteria	• Displays poor listening skills • Loses and/or misplaces items needed to complete activities or tasks • Sidetracked by external or unimportant stimuli • Forgets daily activities • Diminished attention span • Lacks ability to complete schoolwork and other assignments or to follow instructions • Avoids or is disinclined to begin homework or activities requiring concentration • Fails to focus on details and/or makes thoughtless mistakes in schoolwork or assignments
Hyperactive/ Impulsive Type Diagnosis Criteria	**Hyperactive Symptoms:** • Squirms when seated or fidgets with feet/hands • Marked restlessness that is difficult to control • Appears to be driven by "a motor" or is often "on the go" • Lacks ability to play and engage in leisure activities in a quiet manner • Incapable of staying seated in class • Overly talkative **Impulsive Symptoms:** • Difficulty waiting turn • Interrupts or intrudes into conversations and activities of others • Impulsively blurts out answers before questions completed
Additional Requirements for Diagnosis	• Symptoms present prior to age 12 years • Symptoms not better accounted for by a different psychiatric disorder (e.g., mood disorder, anxiety disorder) and do not occur exclusively during a psychotic disorder (e.g., schizophrenia) • Symptoms not exclusively a manifestation of oppositional behavior
Classification	***Combined Type:*** • Patient meets both inattentive and hyperactive/impulsive criteria for the past 6 months ***Predominantly Inattentive Type:*** • Patient meets inattentive criterion, but not hyperactive/impulse criterion, for the past 6 months ***Predominantly Hyperactive/Impulsive Type:*** • Patient meets hyperactive/impulse criterion, but not inattentive criterion, for the past 6 months Symptoms may be classified as mild, moderate, or severe based on symptom severity

Source: DSM-5 Diagnostic and Statistical Manual of Mental Disorders, 5th edition; ADHD: attention deficit hyperactivity disorder

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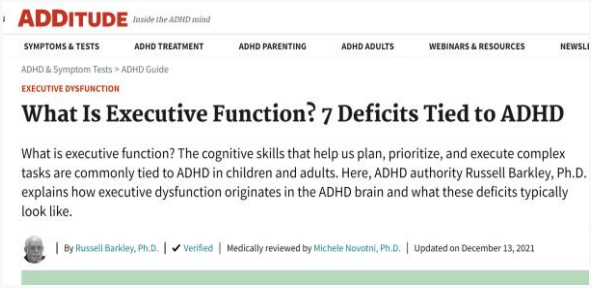
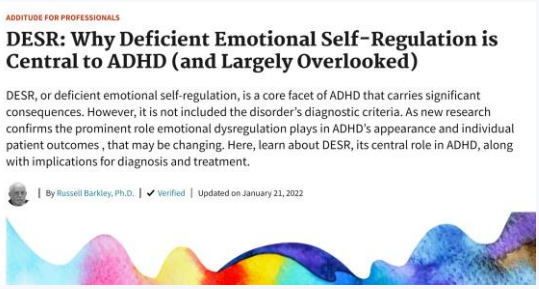
ADHD & Executive Function – Russell Barkley

- ADHD is diagnosed by examination of behaviors
- BUT these behaviors are a reflection of a COGNITIVE PROCESSING disorder– specifically the concept of EXECUTIVE FUNCTION associated with the FRONTAL LOBES





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Executive Function Rating Scales

Some published rating scales

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Comprehensive Executive Function Inventory (CEFI) and the Comprehensive Executive Function Inventory Adult (CEFI Adult) by Naglieri & Goldstein

- **Strength based** EF measures
- Items are **positively** worded
- Higher scores = **good** behaviors related to EF
- Scores set at mean of **100**, SD of **15**
- CEFI: Ages 5-18 years rated by a parent, teacher, or the child/youth
- CEFI Adult: Ages 18+ years rated by the adult or an observer

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If Executive Function Underlies ADHD

Some people who have the behavioral symptoms of ADHD may also have a COGNITIVE component to their disorder

The concept of Executive function is associated with the Frontal Lobes making it a basic psychological process

a weakness on a measure of EF could support eligibility as…

Typically, 504 rule is applied. Also consider a Specific learning disability: defined as a disorder in one or more of the basic psychological processes which manifests as academic failure in specific areas…

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If EF may be the Issue…

A comprehensive approach to assessing EF should be used that includes data from measures of:

Behaviors related to Cognition	Behaviors related to Social-Emotional Skills	Academic and job skills
Neurocognitive Ability is the foundation 		

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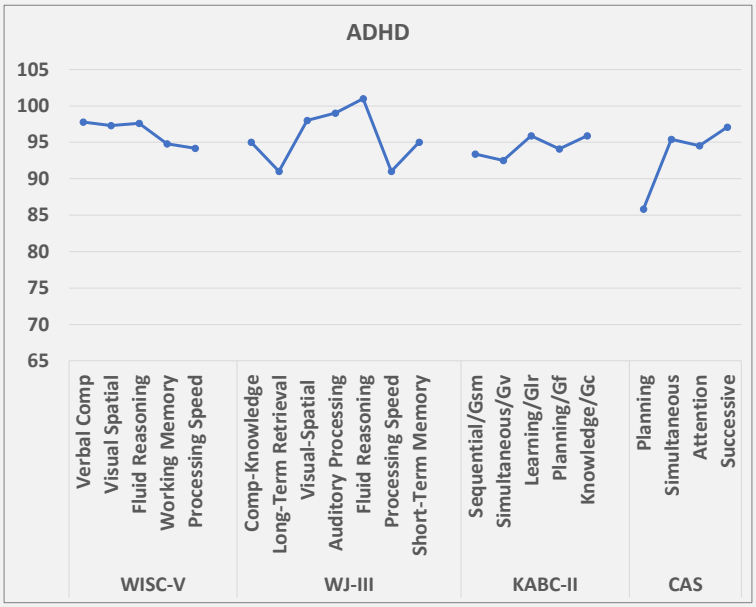
Intelligence and Cognitive Processing Tests' Profiles for Students with **ADHD**

PASS Profile reveals Planning processing weakness



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Assessment of ADHD

- **Is there impairment?**

Specify if:

In partial remission: When full criteria were previously met, fewer than the full criteria have been met for the past 6 months, and the symptoms still result in impairment in social, academic, or occupational functioning.

Specify current severity:

Mild: Few, if any, symptoms in excess of those required to make the diagnosis are present, and symptoms result in only minor functional impairments.

Moderate: Symptoms or functional impairment between "mild" and "severe" are present.

Severe: Many symptoms in excess of those required to make the diagnosis, or several symptoms that are particularly severe, are present, or the symptoms result in marked impairment in social or occupational functioning.

— 2 —

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Rating Scale of Impairment (RSI; Goldstein & Naglieri)

Rating Scale of Impairment (RSI) Forms & Scores

RSI (5-12 Years)		RSI (13-18 Years)	
Parent Form	Teacher Form	Parent Form	Teacher form
41 items	29 items	49 items	29 items
Total Score		**Total Score**	
RSI Scales School Social Mobility Domestic Family	**RSI Scales** School Social Mobility	**RSI Scales** School/Work Social Mobility Domestic Family Self-care	**RSI Scales** School Social Mobility

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Assessment of Individuals with Autism Spectrum Disorder

Why measure 'basic psychological processes'

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Gifted Students with Disabilities

- Twice exceptional, or 2E, refers to intellectually gifted children who have a specific learning disability (e.g., dyslexia), Attention Deficit Hyperactivity Disorder (ADHD), or **autism spectrum disorder** (ASD).
  - ASD is identified using the DSM based on observable behaviors
  - Rating scales such as ASRS

DSM-5 Autism Diagnostic Criteria

A. Persistent deficits in social communication and social interaction across multiple contexts,
B. Restricted, repetitive patterns of behavior, interests, or activities,
C. Symptoms must be present in the early developmental period
D. Symptoms cause clinically significant impairment in social, occupational, or other
E. These disturbances are not better explained by intellectual disability

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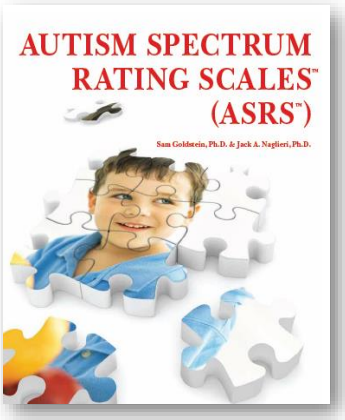

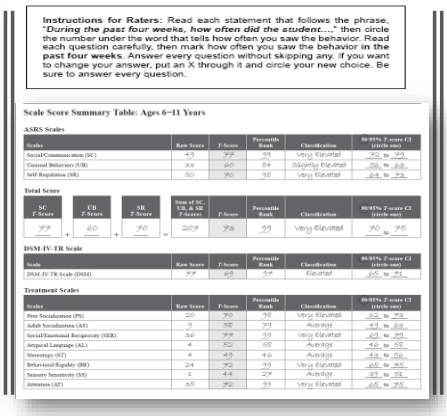

Behavioral Evaluate of ASD

Parents and teacher Rating Scales for ages 2 – 18 years

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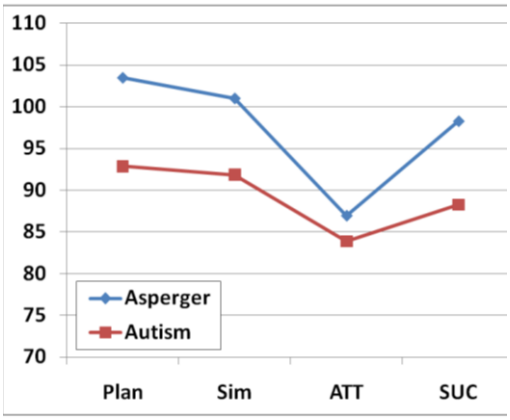
PASS Scores, Autism and Asperger



Descriptive Statistics and Comparisons Between Individuals with Autism (n = 20) and Asperger Syndrome (n = 23).

		Mn	*SD*	*F*	Sig	*d* -ratio
PLAN	Asperger	103.5	31.6	1.71	.20	0.40
	Autism	92.9	19.2			
SIM	Asperger	101.0	15.3	3.33	.08	0.54
	Autism	91.9	17.5			
ATT	Asperger	86.9	17.7	0.30	.59	0.17
	Autism	83.9	18.8			
SUC	Asperger	98.3	15.7	2.46	.12	0.47
	Autism	88.3	25.6			

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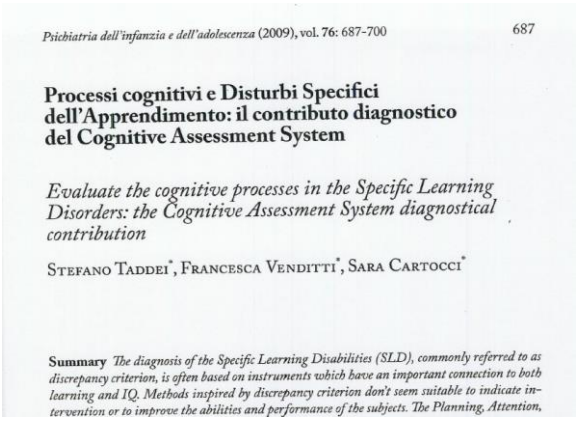
ASD - Italy



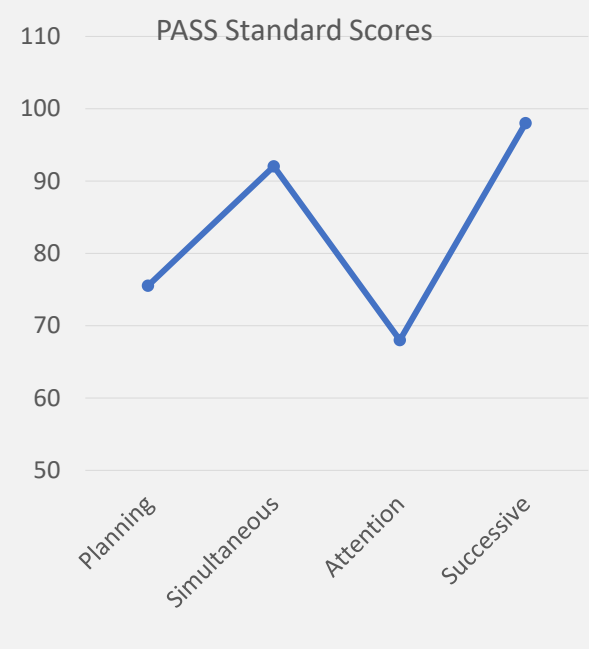
Psichiatria dell'infanzia e dell'adolescenza (2009), vol. 76: 687-700 687

Processi cognitivi e Disturbi Specifici dell'Apprendimento: il contributo diagnostico del Cognitive Assessment System

Evaluate the cognitive processes in the Specific Learning Disorders: the Cognitive Assessment System diagnostical contribution

STEFANO TADDEI*, FRANCESCA VENDITTI*, SARA CARTOCCI*

Summary *The diagnosis of the Specific Learning Disabilities (SLD), commonly referred to as discrepancy criterion, is often based on instruments which have an important connection to both learning and IQ. Methods inspired by discrepancy criterion don't seem suitable to indicate intervention or to improve the abilities and performance of the subjects. The Planning, Attention,*



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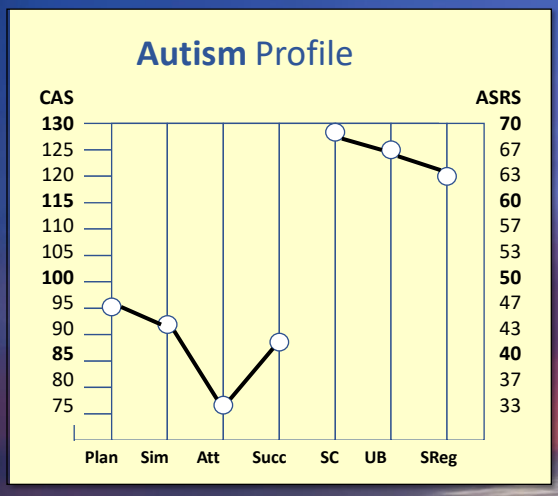
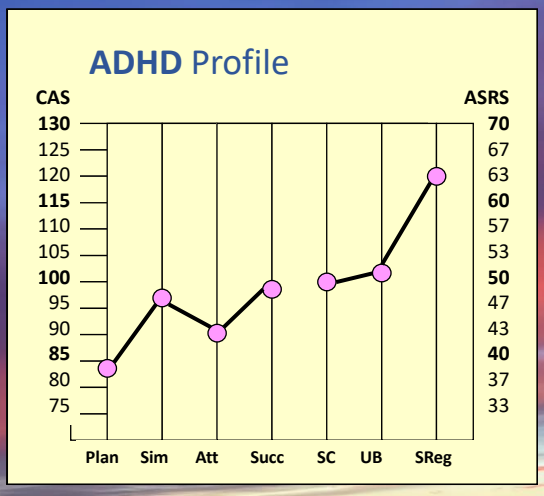
Differential Diagnosis: ADHD vs ASD





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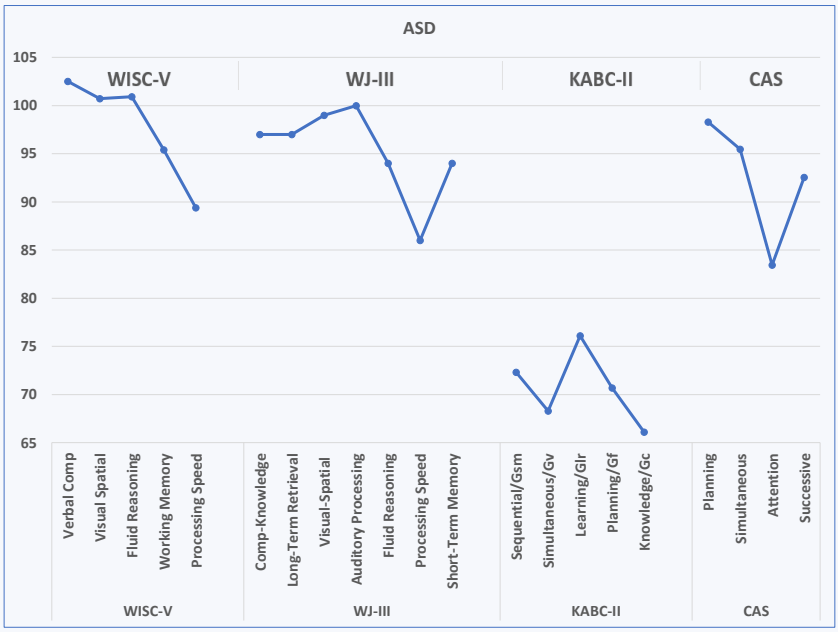
Intelligence and Cognitive Processing Tests' Profiles for Students with **ASD**

PASS Profile reveals Attention processing weakness



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PASS Profiles for Individuals with SLD, ADHD, & ASD

Getting the BIG PICTURE

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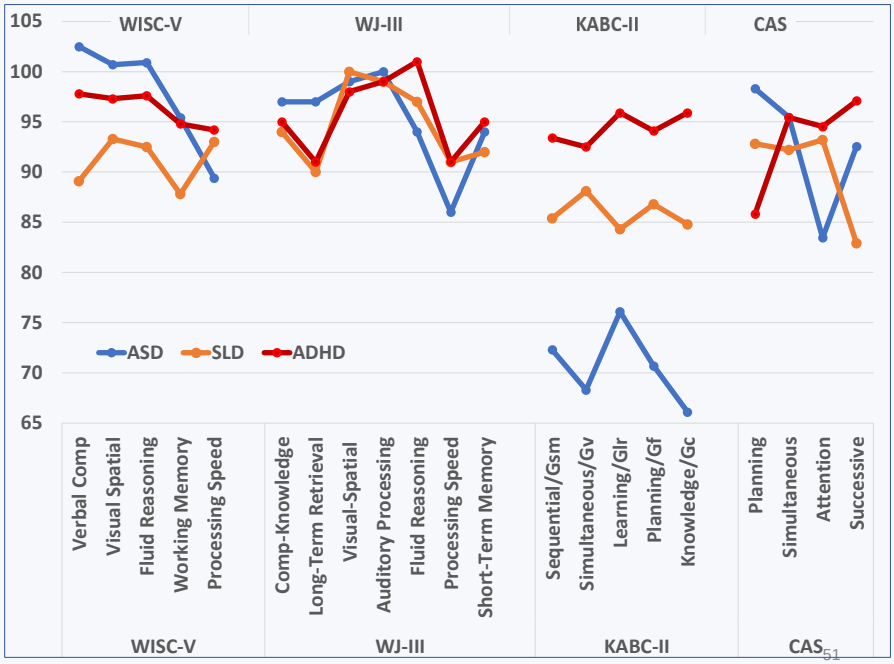
Intelligence and Cognitive Processing Tests' Profiles for **SLD (Dyslexia), ADHD & ASD**



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PASS Profiles for Gifted Students

Application of the Discrepancy Consistency Method

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A Study of Gifted Students (Neurocognitive Profiles of Intellectually Gifted Children: A Pilot Study, In press, 2022).

- 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

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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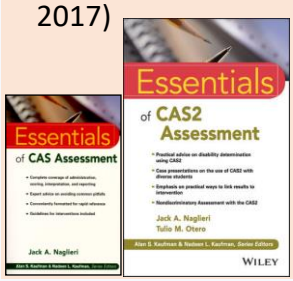
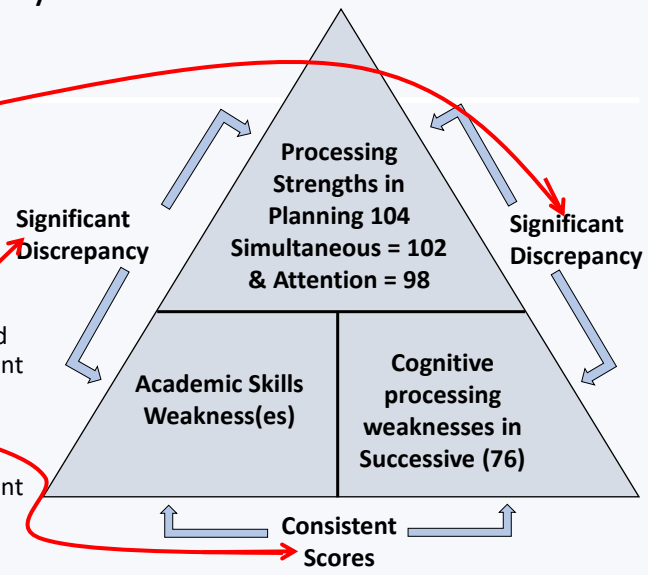
Answering the Question: Why the student fails?

- 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



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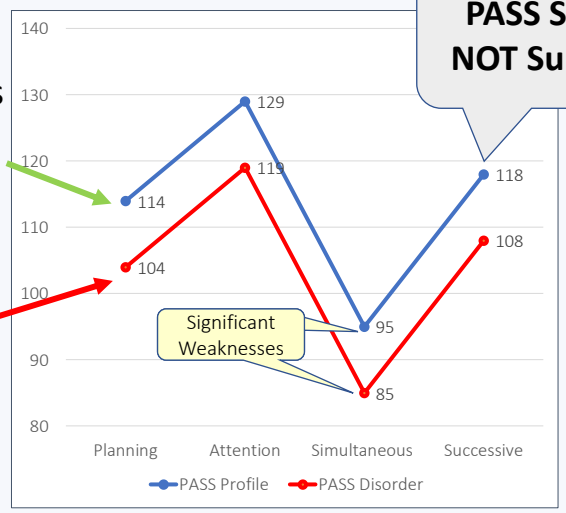
How to Determine a Disorder

- Two types of PASS profile of Strengths & Weaknesses
  - 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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A Study of Gifted Students

- 54% of gifted students had a **PASS score that was significantly different from that student's average** PASS score
  - That means the students has a specific neurocognitive processing strength or weakness (i.e., learning profile)

Table 3.

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

		Planning	Simultaneous	Attention	Successive	PASS
PASS Weakness	n	25	6	18	28	77
	%	18%	4%	13%	20%	54%
PASS Strength	n	7	58	13	12	90
	%	5%	41%	9%	8%	63%

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A Study of Gifted Students

- 4% of the **students identified as GIFTED have a weakness in PASS 'basic psychology processes' AND an achievement test score below 90.**

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

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 with low PASS scores AND low WJ-III achievement suggests a **Specific Learning Disability**

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Gifted SLD Student Profile

CAS2 8-Subtest CORE Battery

BOX #1 Is there a PASS Pattern of Strenghts and Weaknesses (Discrepancy 1)?

Differences Between PASS Scale Standard Scores and the Student's Average PASS Score (p = .05) for the CAS2 12-Subtest CORE battery.

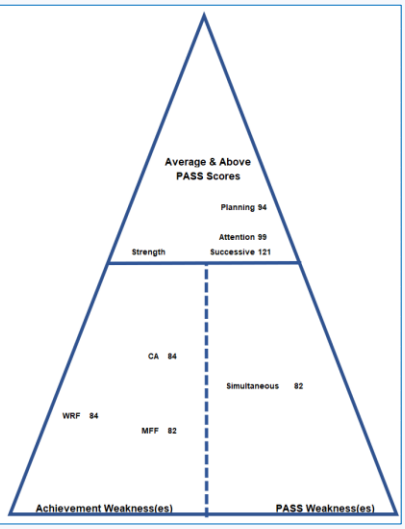
Cognitive Assessment System-2 PASS Scales	Standard Score	PASS Mean & Differences: 99.0	Significantly Different (at p = .05) from PASS Mean?	Strength or Weakness
Planning	94	-5.0	no	
Simultaneous	82	-17.0	yes	Weakness
Attention	99	0.0	no	
Successive	121	22.0	yes	Strength

Notes

1. A Weakness is defined as PASS standard score that is significantly below the child's average PASS score (ipsative 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 (ipsative comparison at the .05 level) and the PASS score is above 109 (i.e. above the Average range).
3. See Essentials of CAS2 Assessment Intepretation Chapter for more details and examples. Note: Comparisons made at p = .05

BOX #2 Are high PASS scores significantly different from low achievement scores (Discrepancy 2)? Are low PASS scores similar to low achievement scores (Consistency)?

			PASS Scores from CAS2			
			Planning	Simultaneous	Attention	Successive
			94	82	99	121
Woodcock-Johnson Fourth Edition Achievement Subtests						
Standard Scores						
	LWID	Leter-Word Identification				
	AP	Applied Problems				
118	SP	Spelling				
	PC	Passage Comprehension				
84	CA	Calculation		Consistent	Discrepant	Discrepant
	WR	Writing Samples				
124	WA	Word Attack				
	OR	Oral Reading				
	SRF	Sentence Reading Fluency				
82	MFF	Math Facts Fluency	Discrepant	Consistent	Discrepant	Discrepant
	SWF	Sentence Writing Fluency				
	RR	Reading Recall				
	NM	Number Matrices				
	Ed	Editing				
84	WRF	Word Reading Fluency		Consistent	Discrepant	Discrepant
	SS	Spelling of Sounds				
	RV	Reading Vocabularty				



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Twice Exceptional **Conclusions**

- Traditional intelligence tests (WISC, WJ, Binet) are **not** sufficient for assessment of students who may be gifted and have a specific learning disability (SLD), autism, ADHD, etc.
- Most defensible way to assess 2e gifted is to use the *Cognitive Assessment System-Second Edition (CAS2)* for the following reasons
  - CAS2 measures 'basic psychological processes' – the key to uniting the definition of SLD with the method of detecting it,
  - it yields the smallest race ad ethnic differences,
  - It yields profiles for special populations,
  - PASS scores predicts achievement better than any other tests *and* these scores can be used to guide instruction

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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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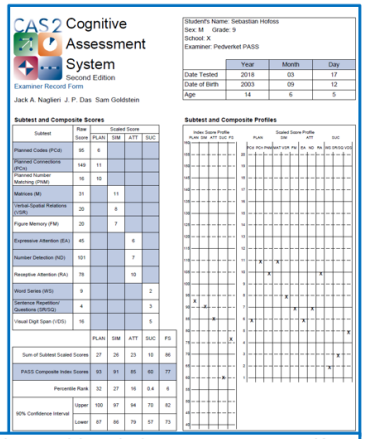
PASS Scores – Successive Processing Weakness and Social Communication Problems

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)	92	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.


CAS2 Cognitive Assessment System
Second Edition
Examiner Record Form
Jack A. Naglieri J. P. Das Sam Goldstein

Student's Name: Sebastian Hofoss
Sex: M Grade: 9
School: X
Examiner: Pedverket PASS

	Year	Month	Day
Date Tested	2018	03	17
Date of Birth	2003	09	12
Age	14	6	5

Subtest and Composite Scores

Subtest and Composite Profiles

Differences Between PASS Scale Standard Scores and the Student's Average PASS Score Required for Sig Subtest EXTENDED battery AGES 8-18 Years.

Cognitive Assessment System - 2		Difference from PASS Mean of:	Significantly Different (at p = .05) from PASS Mean?	Strength or Weakness
PASS Scales	Standard Score	82.3		
Planning	93	10.8	yes	
Simultaneous	91	8.8	yes	
Attention	85	2.8	no	
Successive	60	-22.3	yes	Weakness