

Intelligence Redefined as PASS Neurocognitive Processes and Measured with the CAS2

Jack A. Naglieri, Ph.D.
Emeritus Professor, GMU

jnaglieri@gmail.com
jacknaglieri.com
naglierigiftedtests.com

Naglieri Disclosures



JACKNAGLIERI.COM

Tools for Psychological and Educational Assessment

WELCOME TO JACKNAGLIERI.COM



This site was created to provide tools and resources for both psychologists and educators alike.

Jack A. Naglieri, PhD, has held faculty appointments at Northern Arizona University, The Ohio State University, and George Mason University. He is currently a Research Professor at the University of Virginia, Senior Research Scientist at the Devereux Center for Resilient Children, and Emerita Professor of Psychology at George Mason University.

Dr. Naglieri has developed many tests used by psychologists and educators such as the Naglieri Nonverbal Ability Test, the Cognitive Assessment System, Autism Spectrum Rating Scale, Devereux Student Strength Assessment, Comprehensive Executive Function Inventory, and forthcoming Naglieri General Ability Tests: Verbal, Nonverbal and Quantitative. He is widely known for his efforts to increase participation of traditionally under-represented students in gifted education. He is also well known for the PASS Theory of Intelligence and its application using the CAS for identification of specific learning disabilities using the Discrepancy-Consistency Method, fair and equitable assessment of diverse populations, and academic interventions related to PASS neurocognitive processes.

Naglieri General Ability Tests: Verbal, Nonverbal and Quantitative



The Naglieri General Ability Tests: Verbal, Nonverbal and Quantitative provide equitable assessment of students for gifted educational programs.

Webinars



A webinar library that covers a variety of topics such as EF, Autism Assessment, and SLD. We have created this library to share and learn from each other while staying home and safe.

Handouts



Download PDF handouts of past presentations and related research on the following tests and topics

10-Minute Solutions



Short published papers that describe applications of PASS theory to identify disabilities such as Dyslexia.

Naglieri Feifer SLD



Access all the work that Drs. Jack Naglieri & Steve Feifer have done on the identification of students with specific learning disabilities and learning needs.

Ask Dr. Jack



Dr. Jack Naglieri discusses timely topics and answers frequently asked questions.



General Ability Tests

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EQUITABLE ASSESSMENT OF GIFTED STUDENTS USING THE

Naglieri General Ability Tests: Verbal, Nonverbal & Quantitative

Now Available

A MESSAGE FROM THE AUTHORS

Distinguishing between the Naglieri Nonverbal Ability Tests & the Naglieri General Ability Tests

Thank you for visiting our website and for your interest in the Naglieri General Ability Tests. Like the Naglieri Nonverbal Ability Tests (NNAT), these tests are used for the identification of gifted students. However, several important distinctions exist. The Naglieri General Ability Tests include innovative approaches to test construction that have allowed us to identify students with high intellectual ability in a fair and equitable manner. To achieve that goal we created new tests, which can be solved regardless of the language a student knows and the test questions that demand only a small amount of knowledge.




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QR Codes

PASS Theory of Intelligence and the CAS2

JACK A. NAGLIERI & TULIO M. OTERO




Download Free E-Book




The goal of this e-book is to describe the context in which the PASS Theory of Intelligence was conceived and explain how it guided the construction of the Cognitive Assessment System and its various versions of the second edition.


CAS2 Free Access for Univ Professors




Neurodiversity Podcast



PASS Theory & CAS2



CAS2 Digital Norming Study



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From Norway September 2022 to Cyprus November 2024



"Multifaceted aspects of Applied Neuroscience in typical and atypical cognition"

P R O G R A M

Dr Elena Philippou,
Associate Professor, Department of Life Sciences, University of Nicosia, Cyprus
'Associations between chrono-nutrition behaviours and cognitive function in middle-aged adults: the NUTRICO cross-sectional cohort study.'

Evgenia-Peristera Kouki,
Ph.D. Student
'Visual Expertise for Print in School-Age Children: An Event-Related Potentials Study on Pseudowords and Letter Strings.'

Dr Prokopis C. Prokopiou
Instructor in Radiology, Athinoula A. Martinos, Center for Biomedical Imaging
'Lower resting-state phasic LC activity is associated with cortical tau deposition and Aβ-related cognitive decline in preclinical Alzheimer's Disease.'

1300 - 1400 **Light Reception & Poster Viewings**

1400 - 1520 **CAN Presentations**

Prof. George Spanoulis
Prof. of Psychology & Director of the Language and Cognitive Development Research Group, UCY
& **Andreas Savva,**
Ph.D. Student
'Reframing Cognitive Development: A New Theoretical Perspective through Information Geometry and Mathematical Modeling'

Prof. Timothy C. Papadopoulos
RIF Distinguished Prof. of Psychology, & Director of the Learning Disabilities Group, UCY
& **Dr Argyro Fella**
Assistant Prof. of Education, UNIC
'Eye-Tracking in Reading Research: A Systematic Review of Studies with Children of Varying Reading Ability'

Prof. Georgia Panayiotou
Prof. of Psychology & Director of the Clinical Psychology and Psychophysiology Laboratory, UCY
'Using psychophysiology to assess emotion processes in the lab and beyond and cognitive processes'

1530 - 1630 **Keynote**

Prof Jack Naglieri
Emeritus Prof., George Mason University & Senior Research Scientist, Devereux Center for Resilient Children
'Intelligence Redefined as PASS Neurocognitive Processes and Measured with the CAS2'

1630 - 1700 **Coffee Break & Poster Viewings**

1700 - 1800 **Panel Discussion**

1800 - 1815 **Closing Comments**

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Ideas to Consider



- A Professional Journey**
 - An Awakening About Traditional Intelligence Tests
- A Theory Based on Brain Function**
 - Thinking vs Knowing and Social Justice
- From PASS to CAS2**
 - A Different View of People
- Research Update**
 - PASS and Equity
 - To g or not to g
- PASS Profiles SLD ADHD and ASD**
 - Diagnostic implications

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Traditional IQ and Achievement Tests

- ❖ Working as a school psychologist in 1975 I noticed that items on the WISC we were VERY similar to parts of the achievement tests
 - The *Peabody Individual Achievement Test* (1970) had a General Information and Arithmetic subtests JUST LIKE THE WISC!
 - THAT DID NOT MAKE SENSE
 - In 1977 UGA for Ph.D. With Alan Kaufman who said VIQ=achievement



1975 Charles Campagne Elementary, Bethpage, NY

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1981

Test Results and Interpretations:

On the WISC-R, Amanda earned a Performance IQ of 95±7 which falls in the average range of intelligence and at the 37th percentile rank in comparison to the children her age in the standardization sample. In contrast to this score of average non-verbal intelligence was her Verbal IQ of 52±7. This score is quite low and indicates that her level of facility with the English language falls at about the 1st percentile rank. This score can NOT be considered an estimate of verbal intelligence because Amanda speaks mostly Supai and little English. Due to the large difference between these scores, no Full Scale IQ was computed.

Within the WISC-R a clear pattern emerged: Amanda performed well on tasks that required little or no English language comprehension or expression, and poorly on all tasks which did require these linguistic skills. In fact, even if a task was visual and non-verbal, but required English language comprehension of instructions, she performed more poorly.

WISC-V Full Scale				
Verbal Comprehension	Visual Spatial	Fluid Reasoning	Working Memory	Processing Speed
Similarities	Block Design	Matrix Reasoning	Digit Span	Coding
Vocabulary	Visual Puzzles	Figure Weights	Picture Span	Symbol Search
Information	Picture Concepts	Letter-Number Sequencing		Cancellation
Comprehension		Arithmetic		

WISC-R RECORD FORM

Wechsler Intelligence Scale for Children—Revised

NAME _____
 ADDRESS _____
 PARENT'S _____
 SCHOOL _____
 PLACE OF _____
 REFERRED BY _____

Year 81 Month 8 Day 14
 Date Tested
 Date of Birth 74 4 26
 Age 7 4 18

WISC-R PROFILE

Ch clinicians who wish to draw a profile should first transfer the child's scaled scores to the row of boxes below. Then mark an X on the dot corresponding to the scaled score for each test, and draw a line connecting the X's.

VERBAL TESTS					PERFORMANCE TESTS				
Information	Similarities	Vocabulary	Comprehension	Digit Span	Block Design	Picture Arrangement	Object Assembly	Coding	Mazes
19	18	17	16	15	14	13	12	11	10
19	18	17	16	15	14	13	12	11	10
18	17	16	15	14	13	12	11	10	9
17	16	15	14	13	12	11	10	9	8
16	15	14	13	12	11	10	9	8	7
15	14	13	12	11	10	9	8	7	6
14	13	12	11	10	9	8	7	6	5
13	12	11	10	9	8	7	6	5	4
12	11	10	9	8	7	6	5	4	3
11	10	9	8	7	6	5	4	3	2
10	9	8	7	6	5	4	3	2	1

NOTES: $\bar{x} = 9.4$

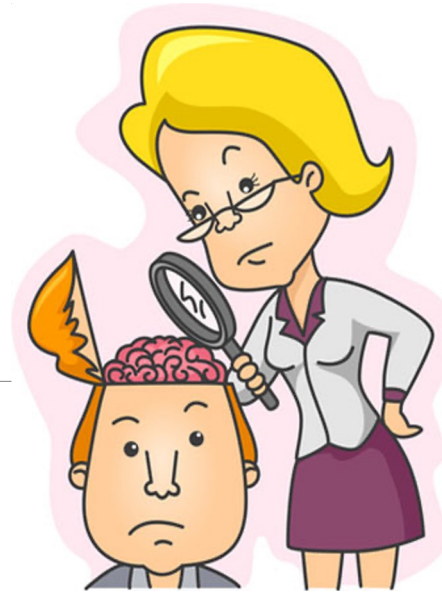
VERBAL TESTS	Raw Score	Scaled Score
Information	3	3
Similarities	0	2
Arithmetic	4	4
Vocabulary	9	1
Comprehension	0	1
(Digit Span)	2	2
Verbal Score 12		
PERFORMANCE TESTS	Raw Score	Scaled Score
Picture Completion	10	8
Picture Arrangement	5	5
Block Design	18	12
Object Assembly	17	11
Coding		
(Mazes)	17	11
Performance Score		
	Scaled Score	IQ
Verbal Score	12	52
Performance Score	47	95
Full Scale Score	59	72

Naglieri, J. A. (1982). Does the WISC-R measure verbal intelligence for non-English speaking children? *Psychology in the Schools*, 19, 478-479.

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I realized that we should measure intelligence in a way that was not dependent on knowledge

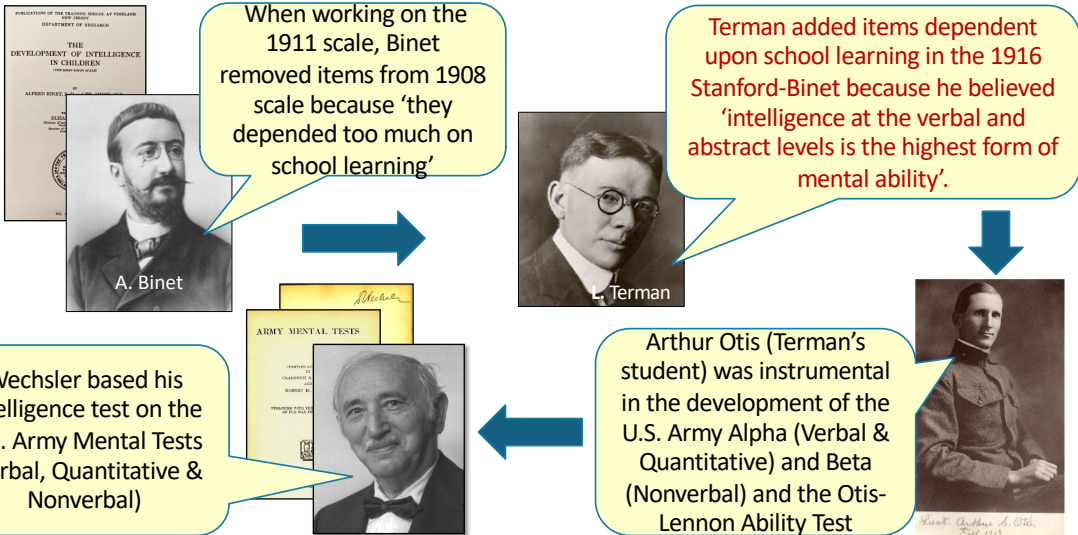
Why we measure intelligence the way we do?



The History of IQ tests

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Binet -> Stanford-Binet -> Army Mental Tests -> WISC



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Tests that Measure Thinking or Knowing?

Girl is woman as
boy is to _____?

3 is to 6 as
4 is to _____?

C⁷ is to F as
E⁷ is to _____?

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Test Bias vs Test Equity

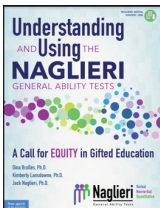
According to the *Standards for Educational and Psychological Testing* (AERA, APA, NCME, 2014) Psychometric TEST BIAS and EQUITY are two different ways of measuring test fairness.

- ❖ ... if a person has had limited opportunities to learn the content in a test of intelligence, *that test may be considered unfair even if there is no evidence of psychometric test bias.*
- ❖ Evidence of EQUITY is examined by test content and mean score differences

AMERICAN EDUCATIONAL RESEARCH ASSOCIATION
AMERICAN PSYCHOLOGICAL ASSOCIATION
NATIONAL COUNCIL ON MEASUREMENT IN EDUCATION

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Race and Ethnic Differences for Traditional and Second-Generation Intelligence Tests



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).


Note: The results summarized here were reported for the Otis-Lennon School Ability Test by Avant and O'Neal (1986); Stanford-Binet IV by Wasserman (2000); Woodcock-Johnson III race differences by Edwards and Oakland (2006) and ethnic differences by Sotelo-Dymaga, Ortiz, Flanagan, and Chaplin (2013); CogAT7 by Carman, Weather and Bartsch (2018) and Lohman (2016); WISC-V by Kaufman, Ratford, and Coatsion (2016); Kaufman Assessment Battery for Children-II by Lichtenberger, Volker, Kaufman & Kaufman, (2006) and Scheiber, C., Kaufman, A.S. Which of the Three KABC-II Global Scores is the Least Biased?. Journal of Pediatric Neuropsychology 1, 21-35 (2015); CAS by Naglieri, Rojahn, Matto, and Aquilino (2005); CAS-2 and CAS2: Brief by Naglieri, Das, and Goldstein, 2014a and 2014b; Naglieri Nonverbal Ability Test by Naglieri and Ronning (2000), and Naglieri General Ability Tests by Naglieri, Brulles, and Lanesdowne (2022).

	By Race	By Ethnicity
Tests that require knowledge	Mn = 9.4	Mn = 6.6
Otis-Lennon School Ability Test (district wide)	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	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
K-ABC II Fluid-Crystallized Index	9.4	9.8
K-ABC II Mental Processing Index	8.1	8.2
WISC-V (statistical controls)	8.7	
Tests that require minimal knowledge	Mn = 4.3	Mn = 2.9
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 control normative data)	4.8	4.8
CAS-2 (statistical control normative data)	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




What is the Practical Impact?

The test you choose **determines** the **results** you receive, the **decisions** you make, and the **future** of that student.



OSEP

Office of Special Education Programs
Office of Special Education and Rehabilitative Services



OSEP Fast Facts: Race and Ethnicity of Children with Disabilities Served under IDEA Part B

For the purposes of this fact sheet, racial ethnic groups are defined in the IDEA Part B Child Count and Educational Environments for School Year 2019-2020, OSEP Data Documentation. <https://www2.ed.gov/programs/osepidea/618-data/collection-documentation/data-documentation-files/part-b/child-count-and-educational-environment/idea-partb-childcountandedenvironment-2019-20.pdf>

Risk Ratio of Students with Disabilities by Disability Category and by Specific Race and Ethnicity, Ages 5 (in kindergarten) through 21: SY 2019-20

<
Intellectual disability
>

Race and Ethnicity	Risk Ratio
All Students with Disabilities	0.06
American Indian or Alaska Native	0.99
Asian	1.03
Black or African American	1.48
Hispanic/Latino	0.99
Native Hawaiian or Other Pacifi...	1.08
Two or more races	0.77
White	0.84


The relative risk ratio of students with disabilities under IDEA by race and Ethnicity is the probability of a student with a disability being identified for intellectual disability. The higher the number, the larger the probability. Nationally, **Black Students are 1.48 times more likely to be identified with intellectual disability** compared to all students with disabilities.

<https://sites.ed.gov/idea/osep-fast-facts-race-and-ethnicity-of-children-with-disabilities-served-under-idea-part->

https://ldaamerica.org/lda_today/disproportionate-identification-of-students-of-color-in-special-education/

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Questions about What I Just Presented?




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Ideas to Consider






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Intelligence as Neurocognitive Functions

- In my first working meeting with JP Das (February 11, 1984) we proposed that intelligence was better REinvented as neurocognitive processes and we began development of the **Cognitive Assessment System**
- We conceptualized intelligence as Planning, Attention, Simultaneous, and Successive (PASS) neurocognitive processes based on Luria’s concepts of brain function.



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Intelligence Redefined as PASS Theory

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

20 min
 CAS2 Rating Scale (4 subtests)
 Total Score
 Planning
 Simultaneous
 Attention
 Successive

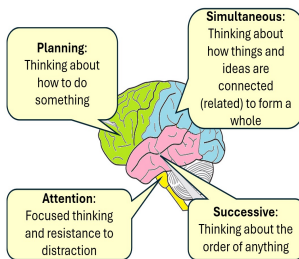
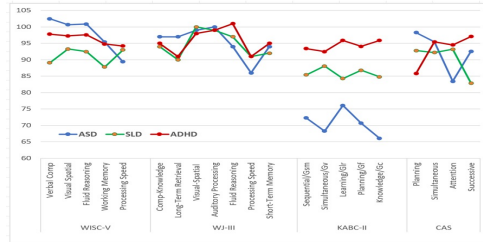
40 min
 CAS2 Brief (4 subtests 20 minutes)
 Total Score
 Planning
 Simultaneous
 Attention
 Successive

60 min
 CAS2 Core (8 subtests 40 minutes)
 Full Scale
 Planning
 Simultaneous
 Attention
 Successive

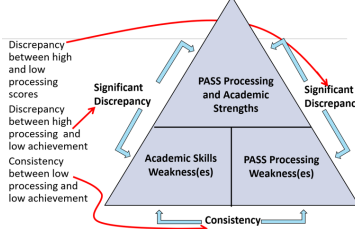
CAS2 Extended (12 subtests 60 minutes)
 Full Scale
 Planning
 Simultaneous
 Attention
 Successive
 Supplemental Scales
 Executive Function
 Working Memory
 Verbal / Nonverbal
 Visual / Auditory
 Speed / Fluency

CAS2 Digital (English & Spanish) coming soon

Patterns of Strengths & Weaknesses

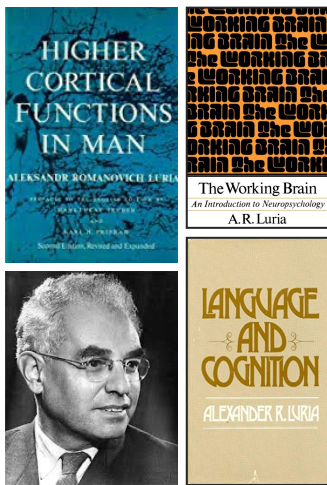


The Discrepancy Consistency Method for SLD



Tests that require knowledge	By Race Mn = 9.4	By Ethnicity Mn = 6.6
Oris-Lennon School Ability Test	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	11.8	7.6
CogAT7 Verbal	6.8	5.3
CogAT7 Quantitative	9.6	3.6
CogAT7 Nonverbal	6.4	2.9
CogAT7 Total (V, Q & NV)	7.0	4.5
K-ABC II Fluid-Crystallized Index	9.4	9.8
K-ABC II Mental Processing Index	8.1	8.2
WISC-V (statistical controls)	8.7	
Tests that require minimal knowledge		
K-ABC (normative sample)	7.0	
K-ABC (matched samples)	6.1	
K-ABC II (adjusted for gender & SES)	6.7	5.4
CAS-2 (normative sample)	6.3	4.5
CAS (statistical control normative data)	4.8	4.8
CAS-2 (statistical control normative data)	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

PASS Neurocognitive Theory

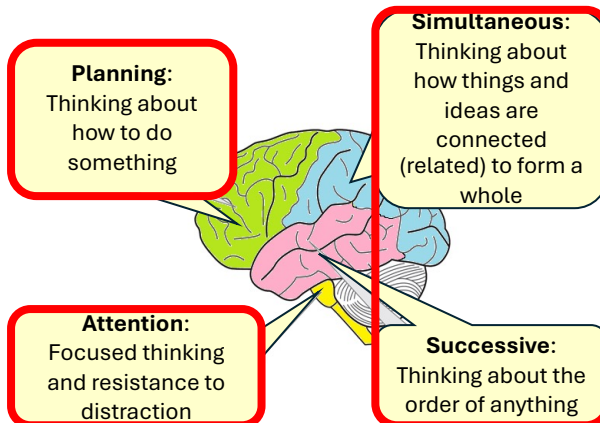


- **P**lanning = THINKING ABOUT HOW YOU DO WHAT YOU DECIDE TO DO
 - **A**ttention = FOCUSED THINKING AND RESISTANCE TO DISTRACTIONS
 - **S**imultaneous = THINKING ABOUT HOW THINGS GO TOGETHER
 - **S**uccessive = THINKING ABOUT THE SEQUENCE OF THINGS
- PASS** = 'basic psychological processes'

NOTE: Easy to understand concepts!

A Way to Understand Learning, Obstacles to Learning and Specific Learning Disabilities

- The first step is being alert and focused
- The second step is deciding how to achieve a goal
- The third step is applying different ways to solving various tasks



From: *Essentials of CAS2 Assessment*. Naglieri & Otero, 2017 Figure 1.2 Functional Units from A. R. Luria

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Four Ways to Measure Thinking (PASS) not Knowing

A	B	C	D
X	O	O	X

A	B	C	D	A
X	O	O	X	
A	B	C	D	A
X	O			
A	B	C	D	A
X	O			

- Planning**
1. Planned Codes
 2. Planned Connections
 3. Planned Number Matching

RED RED
YELLOW
BLUE
YELLOW

- Attention**
1. Expressive Attention
 2. Number Detection
 3. Receptive Attention

1 2 3 4 5

- Simultaneous**
1. Matrices
 2. Verbal Spatial Relations
 3. Figure Memory

4 3 8 6 1

- Successive**
1. Visual Digit Span
 2. Word Series
 3. Sentence Repetition or Questions

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Planning Subtests

Planned Codes

Planned Connections 1

2 4 3

Planned Number Matching

5176 5761 5167 1576 5176 1567



Examiner Record Form
Jack A. Naglieri J. P. Das Sam Goldstein

Section 2. Subtest and Composite Scores

Subtest	Raw Score	Scaled Score			
		PLAN	SIM	ATT	SUC
Planned Codes (PCG)					
Planned Connections (PCN)					
Planned Number Matching (PNM)					
Matrices (MAT)					
Verbal-Spatial Relations (VSR)					
Figure Memory (FM)					
Expressive Attention (EA)					
Number Detection (ND)					
Receptive Attention (RA)					
Word Series (WS)					
Sentence Repetition/Questions (SR/SQ)					
Visual Digit Span (VDS)					
Sum of Subtest Scaled Scores		+	+	+	+
PASS Composite Index Scores					
Percentile Rank					
Upper					
Lower					

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Planned Codes Page 1

A	B	C	D		
X	O	O	O	X	X
A	B	C	D	A	
X	O	O	O	X	
A	B	C	D	A	
X	O	O		X	
A	B	C	D	A	
X	O	O		X	

- ▶ Jack Jr. at age 5
- ▶ Child fills in the codes in the empty boxes
- ▶ After being told the test requirement, examinees are told: "You can do it any way you want"

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Attention Subtests

Expressive Attention

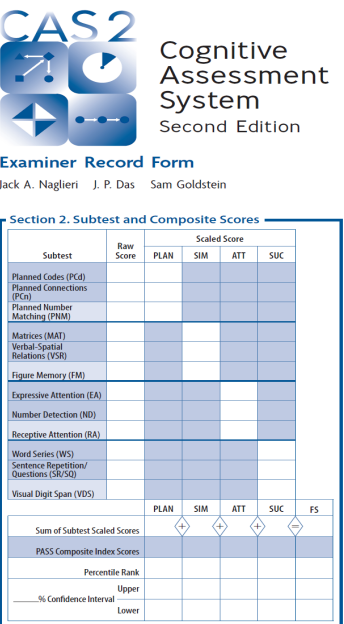
Number Detection

Receptive Attention

Find the numbers that look like this: 1 2

1	5	1	4	2	2	5
---	---	---	---	---	---	---

N n	T r	b t
TR	n b	A a



Section 2. Subtest and Composite Scores

Subtest	Raw Score	Scaled Score				
		PLAN	SIM	ATT	SUC	
Planned Codes (PCd)						
Planned Connections (PCn)						
Planned Number Matching (PNM)						
Matrices (MAT)						
Verbal-Spatial Relations (VSR)						
Figure Memory (FM)						
Expressive Attention (EA)						
Number Detection (ND)						
Receptive Attention (RA)						
Word Series (WS)						
Sentence Repetition/Questions (SR/SQ)						
Visual Digit Span (VDS)						
		PLAN	SIM	ATT	SUC	FS
Sum of Subtest Scaled Scores		+	+	+	+	
PASS Composite Index Scores						
Percentile Rank						
Upper						
Lower						

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PASS Theory: Attention

- Attention is a basic psychological process we use to
 - selectively attend to some stimuli
 - Focus our cognitive activity
 - Selective attention
 - Resistance to distraction

posed to hearing

BLU	VERDE	GIALLO
VERDE	BLU	GIALLO

빨강	파랑	초록	노랑
----	----	----	----

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

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Simultaneous Subtests

- Matrices
- Verbal Spatial Relations
- Figure Memory

Subtest	Raw Score	Scaled Score				
		PLAN	SIM	ATT	SUC	
Planned Codes (PCG)						
Planned Connections (PCN)						
Planned Number Matching (PNM)						
Matrices (MAT)						
Verbal-Spatial Relations (VSR)						
Figure Memory (FM)						
Expressive Attention (EA)						
Number Detection (ND)						
Receptive Attention (RA)						
Word Series (WS)						
Sentence Repetition/Questions (SR/SQ)						
Visual Digit Span (VDS)						
		PLAN	SIM	ATT	SUC	FS
Sum of Subtest Scaled Scores		+	+	+	+	
PASS Composite Index Scores						
Percentile Rank						
Upper						
Lower						

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PASS Theory: Simultaneous

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

Which picture shows a ball under the table?

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Successive Subtests

Word Series

Sentence Repetition or Sentence Questions

Visual Digit Span

CAS 2
Cognitive Assessment System
Second Edition

Examiner Record Form
Jack A. Naglieri J. P. Das Sam Goldstein

Section 2. Subtest and Composite Scores

Subtest	Raw Score	Scaled Score			
		PLAN	SIM	ATT	SUC
Planned Codes (PCG)					
Planned Connections (PCN)					
Planned Number Matching (PNM)					
Matrices (MAT)					
Verbal-Spatial Relations (VSR)					
Figure Memory (FM)					
Expressive Attention (EA)					
Number Detection (ND)					
Receptive Attention (RA)					
Word Series (WS)					
Sentence Repetition/Questions (SR/SQ)					
Visual Digit Span (VDS)					
Sum of Subtest Scaled Scores		+	+	+	+
PASS Composite Index Scores					
Percentile Rank					
Upper					
Lower					

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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

Recall of Numbers in Order
Successive Processing

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3

8

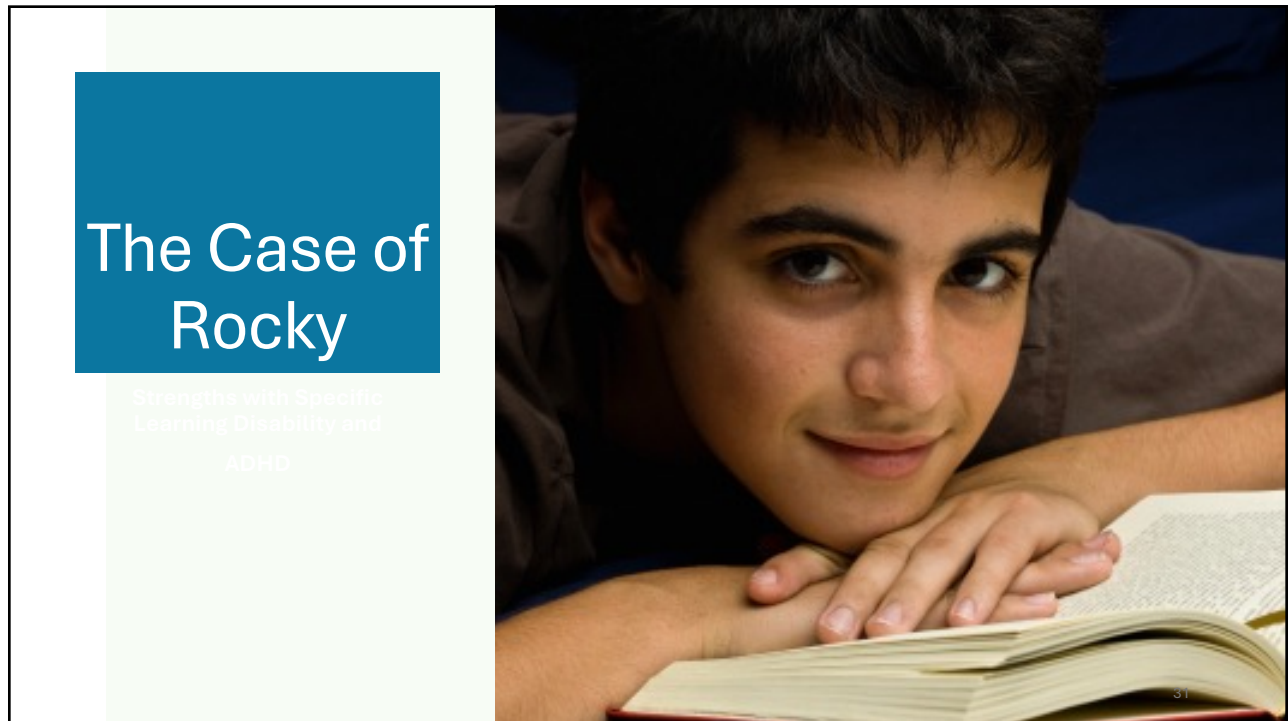
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1

- **Sentence Questions**
 - Child answers a question about a statement made by the examiner such as the following:
 - ***The red greened the blue with a yellow. Who got greened?***

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- 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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Interventions for Rocky

Using Plans to Overcome Anxiety

Some children feel very anxious when they approach a new situation, 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 daily life. Students are often expected to learn large amounts of new and unfamiliar information. Learning facts requires the student to see how information is connected or related. Students often remember this information better when they use graphic organizers.

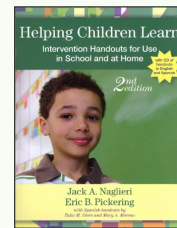
Segmenting Words for Reading/Decoding and Spelling

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 represent.

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 organized 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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A Cognitive Strategy Instruction to Improve Math Calculation for Children With ADHD and LD: A Randomized Controlled Study

Jackie S. Iseman¹ and Jack A. Naglieri¹

Abstract

The authors examined the effectiveness of cognitive strategy instruction based on PASS (Planning, Attention, Simultaneous, Successive) given by special education teachers to students with ADHD randomly assigned by classroom. Students in the experimental group were exposed to a brief cognitive strategy instruction for 10 days, which was designed to encourage

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Planning Facilitation for Math Calculation

Math calculation is a complex activity that involves recalling basic math facts, following procedures, working carefully, and checking one's work. Math calculation requires a careful (i.e., planful) approach to follow all of the necessary steps. Children who are good at math calculation can move on to more difficult math concepts and problem solving with greater ease than those who are having problems in this area. For children who have trouble with math calculation, a technique that helps them approach the task planfully is likely to be useful. Planning facilitation is such a technique.

reas the comparison group received-
ievement were given at pretest. All
dized achievement tests (*Woodcock-
Achievement Test, Second Edition*,
ency was also administered at 1 year
up but not the comparison group on
ations (0.40 and -0.14, respectively).
on group. These findings suggest that
nsfer to standardized tests of math
nd continued advantage 1 year later

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Instructional Sessions

- Math lessons were organized into “instructional sessions” delivered over 13 consecutive days
- Each instructional session was 30-40 minutes
- Each instructional session was comprised of three segments as shown below

10 minutes	10-20 minutes	10 minutes
10 minute math worksheet	Planning Facilitation or Normal Instruction	10 minute math worksheet

Experimental Group

19 worksheets with Planning Facilitation

Vs

Control Group

19 worksheets with Normal Instruction

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Planning (Metacognitive) Strategy Instruction

Teachers Asked

- ▶ Teachers *facilitated* discussions to help students become more self-reflective about use of strategies
- ▶ Teachers asked questions like:
 - What was your goal?
 - Where did you start the worksheet?
 - What strategies did you use?
 - How did the strategy help you reach your goal?
 - What will you do again next time?

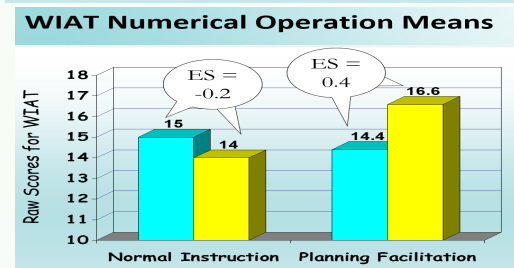
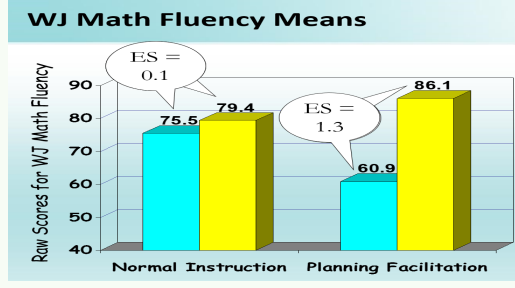
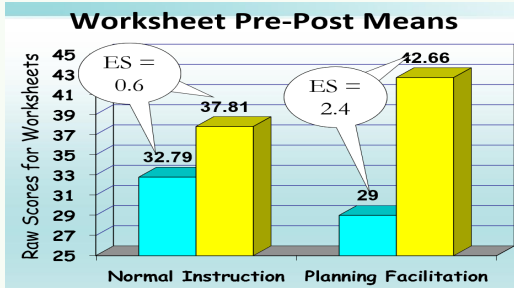
Students Responded

- “My goal was to do all of the easy problems on every page first, then do the others.”
- “I do the problems I know, then I check my work.”
- “I draw lines to keep the columns straight”
- “I did the ones that took the least time”

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Pre-Post Means and Effect Sizes for the Students with LD and ADHD



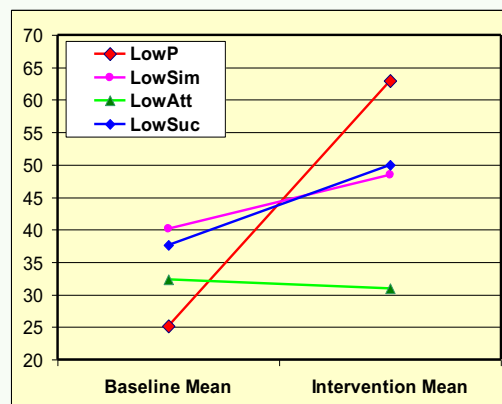
At 1-year follow-up, 27 of the students were retested on the WJ-III ACH Math Fluency subtest as part of the school's typical yearly evaluation of students. This group included 14 students from the comparison group and 13 students from the experimental group. The results indicated that the improvement of students in the experimental group ($M = 16.08$, $SD = 19$, $d = 0.85$) was significantly greater than the improvement of students in the comparison group ($M = 3.21$, $SD = 18.21$, $d = 0.09$).

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Pre-Post Changes for the Students with LD and ADHD

- The students with a weakness in Planning, Simultaneous or Successive processing scales benefited from the Planning Facilitation method
- Importantly, the students with a weakness in Planning improved the most
- This has been the case in all the studies of Planning Facilitation
- **COGNITION PREDICTS RESPONSE TO INTERVENTION**



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Summary of PASS Intervention Research in Essentials of CAS2

<p>Effectiveness of a Cognitive Strategy Intervention in Improving Arithmetic Computation Based on the PASS Theory</p> <p>Jack A. Naglieri and Deanne Johnson</p> <p>Abstract</p> <p>The purpose of this study was to determine if an instruction designed to facilitate planning, given by teachers to their class as a group would have differential effects depending on the specific Planning, Attention, Simultaneous, Successive (PASS) cognitive characteristics of each child. A cognitive strategy instruction that encouraged planning was provided to the group of 70 students with learning disabilities and mild mental impairments. All students completed math worksheets during 7 baseline and 14 intervention weeks. During the intervention phase, students engaged in self-reflection and verbalization of strategies about how the arithmetic computation worksheets should be completed. The sample was sorted into one experimental and four control groups after the experiment. There were four groups with a cognitive weakness in each PASS scale from the Cognitive Assessment System and one of weaknesses contrasted in each of 42 children in the plan.</p> <p>A Cognitive Strategy Instruction to Improve Math Calculation for Children With ADHD and LD: A Randomized Controlled Study</p> <p>Jackie S. Iseman¹ and Jack A. Naglieri¹</p> <p>Abstract</p> <p>The authors examined the effectiveness of cognitive strategy instruction based on PASS (Plan, Attention, Simultaneous, and Successive) given by special education teachers to students with ADHD and LD. Randomly assigned experimental groups were exposed to a brief cognitive strategy instruction for 12 days, with development and application of effective planning for mathematical computation, whereas the standard math instruction. Standardized tests of cognitive processes and math achievement students completed math worksheets throughout the experimental phase. Standardized Johnson Tests of Achievement, Third Edition, Math Fluency and Wordier Individualized Achievement Test (Math Fluency) were administered pre- and postintervention, and Math Fluency was also administered at 1 year follow-up. Large pre-post effect sizes were found for students in the experimental group but not the comparison group on math worksheets (0.85 and 0.76), Math Fluency (1.17 and 0.89), and Numerical Operations (0.60 and -0.14, respectively). At 1 year follow-up, the experimental group continued to outperform the comparison group. These findings suggest that students with ADHD enhanced greater improvement in math worksheets, for transfer to standardized tests of math (which measured the skill of generalizing learned strategies to other similar tasks), and sustained advantage 1 year later when provided the PASS-based cognitive strategy instruction.</p>	<p>Reading Psychology, 31:428-454, 2010 Copyright © Taylor & Francis Group, LLC ISSN: 0270-2711 print / 1362-0845 online DOI: 10.1080/027027110036954915</p> <p>Routledge Taylor & Francis Group</p> <p>REMIEDIATING READING COMPREHENSION DIFFICULTIES: A COGNITIVE PROCESSING APPROACH</p> <p>SHAMITA MAHAJAPTRA Christi College, Cuttack, Orissa, India J. P. DAS, HOLLY STACK-CUTLER, and RAUNO PARRILA Department of Educational Psychology, University of Alberta, Edmonton, Alberta, Canada</p> <p><i>The efficacy of a cognitive-based remediation program was investigated with 14 English-as-a-second-language (ESL) poor readers in Grade 4 who had significant difficulty in comprehension and 14 normal ESL readers in Grade 4 who achieved no remediation. Both groups were selected from 2 English-medium schools in India. The results of the study showed that the remediation program had significant positive effects on reading comprehension scores of the ESL poor readers.</i></p> <p>Mathematics Instruction and PASS Cognitive Processes: An Intervention Study</p> <p>Jack A. Naglieri and Suzanne H. Gottling</p> <p>Abstract</p> <p>The purpose of this study was to determine if an instruction designed to facilitate planning, given by a group, would have differential effects depending on the specific cognitive characteristics of the individual instruction that facilitated planning was provided to a group of 12 students with learning disabilities. All work sheets during 7 sessions of baseline and 21 sessions of intervention (when the instruction designed) provided. During the intervention phase, students engaged in self-reflection and verbalization of strategy problems were completed. The class was sorted according to planning scores, obtained using the Cog which is based on Planning, Attention, Simultaneous, Successive (PASS) theory and low- and high- plans identified. The results, consistent with previous research, showed that teaching control and regulated identical effects for all students but was especially helpful for those who were poor in planning, as do implications of these findings are provided.</p>	<p>J. P. Das, Denyse V. Hayward, George K. Georgiou University of Alberta Troy Janzen Taylor University College Nadim Bawa Nipshikopakh Middle School</p> <p>Comparing the Effectiveness of Two Reading Intervention Programs for Children With Reading Disabilities</p> <p>Abstract</p> <p>The effectiveness of two reading intervention programs (phonics-based and inductive learning) was investigated with 63 First Nations children identified as poor readers in Grades 3 and 4 in Study 1, whereas in Study 2, the efficacy of booster sessions for inductive learning or PREP (PASS Reading Enhancement Program) was examined. The major dependent variables in Study 1 were percent to percent changes following intervention on reading tests for word reading and word decoding. Other variables were the number of minutes completed tests of orthographical awareness, rapid automatized naming, and oral reading fluency.</p> <p>Journal of Psychoeducational Assessment 38(3), 22, 2020-2021</p> <p>PLANNING FACILITATION AND READING COMPREHENSION: INSTRUCTIONAL RELEVANCE OF THE PASS THEORY</p> <p>Frederick A. Haddad Kyrene School District, Tempe, Arizona Y. Evie Garcia Northern Arizona University Jack A. Naglieri George Mason University Michelle Grinditch, Ashley McAndrews, Jane Eubanks Kyrene School District, Tempe, Arizona</p> <p><i>The purpose of this study was to evaluate whether an instruction designed to facilitate planning would have differential benefits on reading comprehension, depending on the specific Planning, Attention, Simultaneous, and Successive (PASS) cognitive characteristics of each child. A sample of 45 fourth-grade general education children was sorted into three groups based on each PASS scale score from the Cognitive Assessment System (CAS). The groups did not differ by CAS Full Scale standard score, chronological age, gender, or pretest reading comprehension scores. After each child's pretest reading comprehension instructional level was determined, a cognitive strategy instruction intervention was conducted. The children completed a reading comprehension passage at their respective instructional levels after the intervention. Results showed that children with a Planning weakness ($n = 15$) benefited substantially (effect size of 1.52) from the instruction designed to facilitate planning. Children with a Simultaneous weakness ($n = 21$; effect size = .32) or a Successive weakness ($n = 15$; effect size of .86) did not benefit as much. These results support previous research suggesting that PASS profiles are relevant to instruction.</i></p>
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Questions or Comments about What I Just Presented?



Ideas to Consider



A Professional Journey

- An Awakening About Traditional Intelligence Tests

A Theory Based on Brain Function

- Thinking vs Knowing and Social Justice

From PASS to CAS2

- A Different View of People

Research Update

- PASS and Equity
- To g or not to g

PASS Profiles SLD ADHD and ASD

- Diagnostic implications

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CAS2 for (Ages 5-18 yrs.)








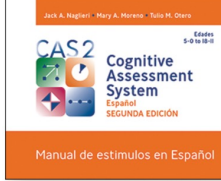
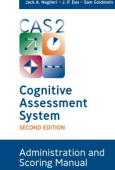
NEW! CAS2 Digital
(English and Spanish)
coming soon with
integrated scoring and
narrative report

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Ways to Measure PASS

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


			
<p>CAS2 Rating Scale (4 subtests)</p> <p>Total Score Planning Simultaneous Attention Successive</p> 	<p>CAS2 Brief (4 subtests 20 minutes)</p> <p>Total Score Planning Simultaneous Attention Successive</p> 	<p>CAS2 Core (8 subtests 40 minutes)</p> <p>Full Scale Planning Simultaneous Attention Successive</p> 	<p>CAS2 Extended (12 subtests 60 minutes)</p> <p>Full Scale Planning Simultaneous Attention Successive Supplemental Scales Executive Function Working Memory Verbal / Nonverbal Visual / Auditory Speed / Fluency</p> 

CAS2 Digital
(English & Spanish)
coming soon

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Ideas to Consider



A Professional Journey

- An Awakening About Traditional Intelligence Tests

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- PASS and Equity
- To g or not to g

PASS Profiles SLD ADHD and ASD

- Diagnostic implications

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

George K. Georgiou^{a,*}, Kan Guo^{b,c,d}, Nithya Naveenkumar^e, Ana Paula Alves Vieira^f, J.P. Das^g

^aUniversity of Alberta, Canada
^bPeking Normal University, China
^cState University of Maringá, Brazil

ARTICLE INFO **ABSTRACT**

Keywords:
Intelligence
Mathematics
Meta-analysis
PASS processes
Reading

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. (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 School Psychology Quarterly 2007, Vol. 22, No. 3, 432-448

Jack A. Naglieri
George Mason University

Tulio Otero
Columbia College, Elgin Campus

Brianna DeLauder
George Mason University

Holly Matto
Virginia Commonwealth University



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 used. Differences in the language versions were noted between the Simultaneous and Successive PASS processes. Specific subtests were found to contribute to the differences between the two versions of the CAS. Comparisons on both versions of the CAS consistently despite the language used.

Keywords: bilingual assessment, non-biased assessment

APPLIED NEUROPSYCHOLOGY: CHILD, 0: 1-9, 2012
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ISSN: 2162-2965 print/2162-2973 online
DOI: 10.1080/07162965.2012.670547

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

Tulio M. Otero
Departments of Clinical Psychology and School Psychology, Chicago School of Professional Psychology, Chicago, Illinois

Lauren Gonzales
George Mason University, Fairfax, Virginia

Jack A. Naglieri
University of Virginia, Fairfax, Virginia

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). Full Scale (FS) scores as well as PASS processing scale scores were found in FS scores or in any of the PASS cognitive profiles were similar on both versions of the CAS. Comparisons on both versions of the CAS consistently despite the language used. 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

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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



Psychological Assessment © 2012 American Psychological Association 1040-3590/12/\$12.00 DOI: 10.1037/a0029828

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

Jack A. Naglieri
University of Virginia and Devereux Center for Resilient Children

Stefano Taddei
University of Florence

Kevin Williams
Multi-Health Services, Toronto, Ontario, Canada

This study examined Italian and U.S. children's performance on the English and Italian versions, respectively, of the Cognitive Assessment System (CAS; Naglieri & Conway, 2009; Naglieri & Das, 1997), a test based on a neurocognitive theory of intelligence entitled PASS (Planning, Attention, Simultaneous, and Successive; Naglieri & Das, 1997; Naglieri & Otero, 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 Italians and Americans for the 5- to 7-year-old (root-mean-square error of approximation [RMSEA] = .038; 90% confidence interval [CI] = .033, .043; comparative fit index [CFI] = .96) and 8- to 18-year-old (RMSEA = .036; 90% CI = .028, .043; CFI = .97) age groups. The Full Scale standard scores (using the U.S. norms) for the Italian (100.9) and U.S. (100.5) samples were nearly identical. The scores between the samples for the PASS scales were very similar, except for the Attention Scale (d = 0.26), where the Italian sample's mean score was slightly higher. Negligible mean differences were found for 9 of the 13 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.



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), 468–472.
<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).

Support for 'g'

Psychological Assessment © 2011 American Psychological Association 1040-3590/11/\$12.00 DOI: 10.1037/a0026855

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

Nicholas F. Benson and Alexander Beaujean
Baylor University

Ryan J. McGill
College of William & Mary

Stefan C. Dombrowski
Baylor 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.

KABC-II

- “No evidence for a four-factor (Luria model) solution was found”
- Support for the “general factor” was found ... “interpretation should focus primarily, if not exclusively, at that level”

Article

Exploratory Higher Order Analysis of the Luria Interpretive Model on the Kaufman Assessment Battery for Children–Second Edition (KABC-II) School-Age Battery

Ryan J. McGill¹ and Angelia R. Spurgin¹

Abstract

Higher order factor structure of the Luria interpretive scheme on the Kaufman Assessment Battery for Children–Second Edition (KABC-II) for the 7- to 12-year and the 13- to 18-year age groups in the KABC-II normative sample ($N = 2,025$) is reported. Using exploratory factor analysis, multiple factor extraction criteria, and hierarchical exploratory factor analysis not included in the KABC-II manual, two-, three-, and four-factor extractions were analyzed to assess the hierarchical factor structure by sequentially partitioning variance appropriately to higher order and lower order dimensions as recommended by Carroll. No evidence for a four-factor solution was found. Results showed that the largest portions of total and common variance were accounted for by the second-order general factor and that interpretation should focus primarily, if not exclusively, at that level of measurement.

Assessment
2017, Vol. 24(4) 540–552
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DOI: 10.1177/1073191115614081
journals.sagepub.com/home/asm
SAGE

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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>

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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.

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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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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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CAS2 Factor Analytic Study (in review 2024)

Unravelling the Multifaceted Nature of Intelligence: A Correlated Factor Model Approach with Insights from the PASS Theory

Papadopoulos, Spanoudis, Naglieri and Das concluded:

“Our results unambiguously support the notion is not a unidimensional entity but a composite of distinct cognitive processes...planning, attention, simultaneous and successive processing.”

- **Abstract:** Intelligence, a subject of profound interest within psychology, has seen extensive exploration of its psychological and psychometric foundations. This study delves into the multifaceted nature of intelligence, using advanced structural equation modeling techniques to examine theory-driven conceptualizations of the construct. We tested *g* factor models, including unidimensional, correlated, higher-order, and bifactor symmetrical and asymmetrical models. To enhance the reliability and generalizability of the findings, we used a large and diverse cohort based on the PASS (Planning, Attention, Simultaneous, Successive) theory and the Cognitive Assessment System 2 (CAS2), which was standardized in the US. Results showed that the correlated factor model, which posits separate cognitive domains, offers the most fitting representation of intelligence. This outcome aligns with the PASS theory's theoretical foundations, emphasizing intelligence's multifaceted nature. Also, our exploration of gender invariance underscores the importance of considering gender-related differences in cognitive processes. By endorsing a correlated factor model, our study encourages a nuanced understanding of intelligence that acknowledges the diversity and interconnectedness of cognitive processes, with potential implications for education and clinical assessment practices.

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Questions about What I Just Presented?



Perguntas sobre o que eu apresentei?

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Ideas to Consider



A Professional Journey

- An Awakening About Traditional Intelligence Tests

A Theory Based on Brain Function

- Thinking vs Knowing and Social Justice

From PASS to CAS2

- A Different View of People

Research Update

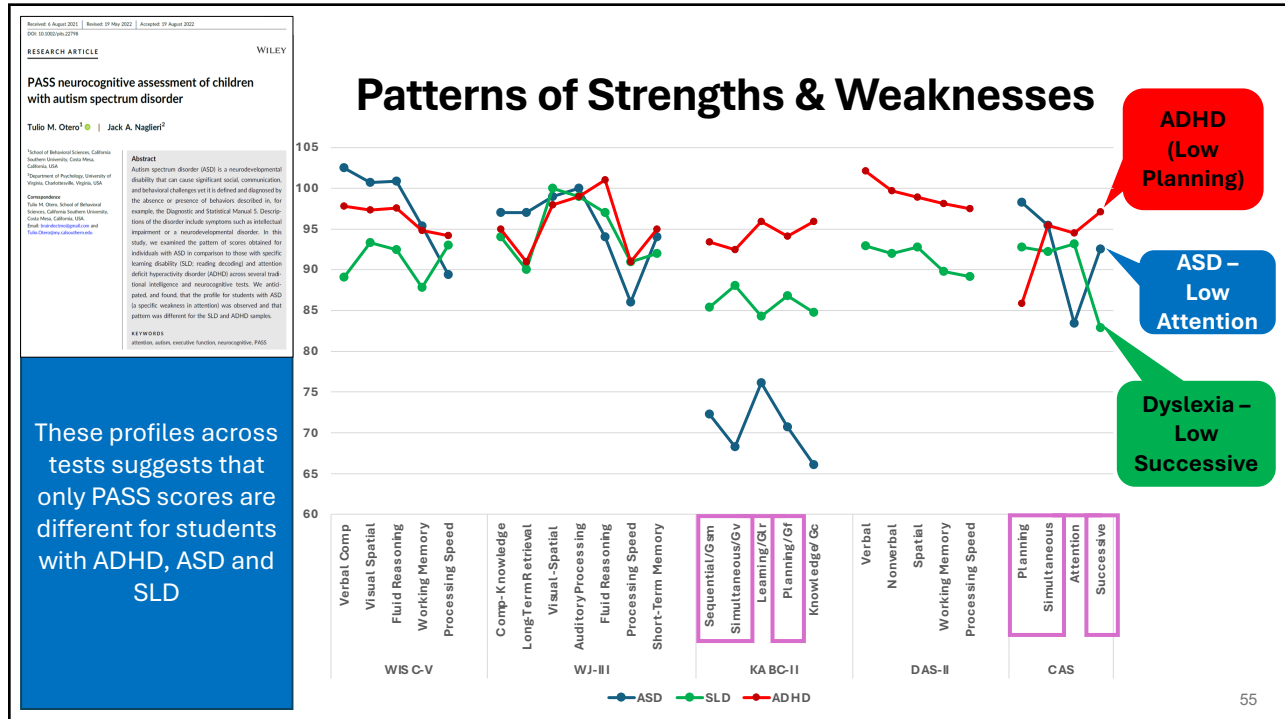
- PASS and Equity
- To *g* or not to *g*

PASS Profiles SLD ADHD and ASD

- Diagnostic implications

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Research on PASS Profiles

- “the CAS...yields information that contributes to the differential diagnosis of students suspected of having a **learning disability in writing**”

Cognitive Assessment System Construct and Diagnostic Utility in Assessing ADHD

Gary L. Canivez Allison R. Gaboury
Eastern Illinois University Puyallup School District, Puyallup, WA

Paper presented at the 2010 Annual Convention of the American Psychological Association, San Diego, CA

Correspondence concerning this paper should be addressed to Gary L. Canivez, Ph.D., Department of Psychology, Eastern Illinois University, 600 Lincoln Avenue, Charleston, IL 61920-3099. Dr. Canivez can also be contacted via E-mail at gcanivez@eiu.edu or the World Wide Web at <http://www.ui.edu/~gcanivez/>. This handout is based on a manuscript presently submitted for publication so please do not reference without permission.

Journal of Psychoeducational Assessment
2003, 21, 180-195

DISCRIMINANT VALIDITY OF THE COGNITIVE ASSESSMENT SYSTEM FOR STUDENTS WITH WRITTEN EXPRESSION DISABILITIES

Judy A. Johnson
University of Houston - Victoria
 Achilles N. Bardos
University of Northern Colorado
 Kandi A. Tavehli
Sam Houston State University

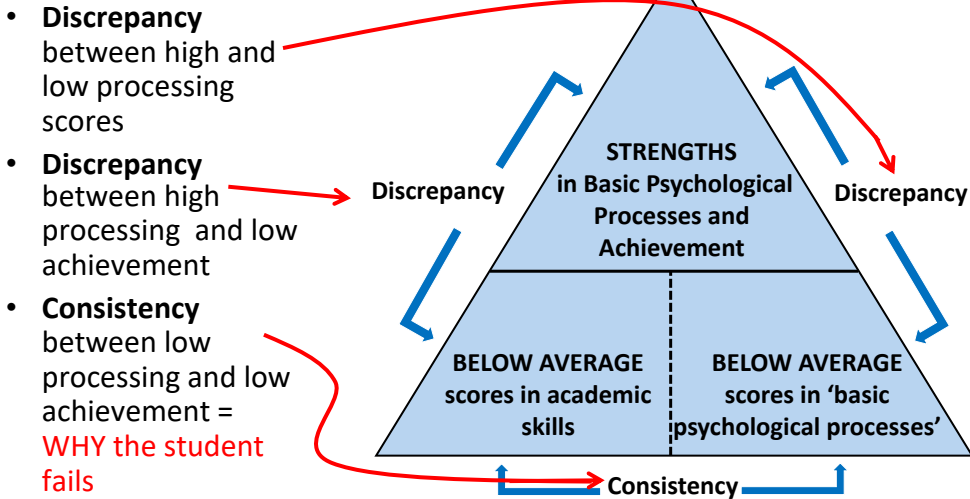
This study explored the PASS cognitive processing theory in junior high students (aged 11-15 years) with and without written expression disabilities. Ninety-six students with (n = 48) and without (n = 48) written expression disabilities were administered the Das-Naglieri Cognitive Assessment System (DN-CAS; 1997) and the writing subtests of the Wechsler Individual Achievement Test (WIAT; 1992). Discriminant analyses were utilized to identify the DN-CAS subtests and composites that contributed to group differentiation. The Planning composite was found to be the most significant contributor among the four composite scores. Subsequent efficiency of classification analyses provided strong support for the validity of the obtained discriminant functions in that the four DN-CAS composite scale scores correctly identified 85% of the students as members of their respective groups.

- “the present study demonstrated the potential of the CAS to correctly identify students who demonstrated behaviors consistent with **ADHD** diagnosis.”

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Discrepancy Consistency Method (DCM)



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

Discrepancy Consistency Method (DCM)

- Discrepancy #1 between high and low processing scores
- Discrepancy #2 between high processing and low achievement
- Consistency between low processing and low achievement

HOW TO USE THIS WORKBOOK:

1. Click on tab for the CAS2 Extended (12-subtests) or Core (8-subtests) with the FAR or FAM.
2. Enter the PASS scores in the column labeled "Standard Scores" in BOX #1.
3. Enter the FAR and/or FAM standard scores in BOX #2.

Note: Once the PASS and FAR or FAM scores are entered the discrepancies and consistencies between neurocognitive and achievement scores will be noted. Follow the Flow-Chart (see Figure 3.2 included here which is from Essentials of CAS2 Assessment) for more guidance.

The information contained in this spreadsheet is taken in part from *Essentials of CAS2 Assessment* by Jack A. Naglieri & Tullio M. Otero (2017). See that book for more information on the interpretation of the CAS2 measures of PASS neurocognitive processes. The values needed for significance between the CAS2 with the FAR and FAM appear in Appendix D and E of the CAS2 Essentials book, respectively, as is a discussion of the methodology used and related topics.

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CAS2 PSW Analyzer for WJ4, KTEA3, FAR, FAM

- Enter PASS and achievement test standard scores and all comparisons are tested for significance

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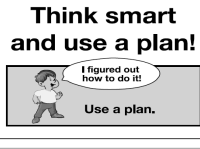
Academic interventions tied to PASS strengths and weaknesses

How Can You Be Smarter?

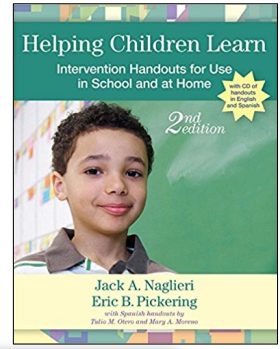
You can be smarter if you **PLAN** before doing things. Sometimes people say, "Look before you leap," "Plan your work and work your plan," or "Stop and think." These sayings are about using the ability to plan. When you stop and think about how to study, you are using your ability to plan.

You will be able to do more if you remember to use a plan. An easy way to remember to use a plan is to look at the picture "Think smart and use a plan!" (Figure 1). You should always use a plan for reading, vocabulary, spelling, writing, math problem solving, and science.

Do you have a favorite plan for learning spelling words? Do you use flashcards or go on the Internet to learn? Do you ask the teacher or another student for help? You can learn more by using a plan for studying that works best for you.



It is smart to have a plan for doing things. When you read, you should have a plan to look at the questions you have to answer. Another plan is to make a list of things to do. When you write you should also have a plan. People who are good at writing think about what they want to say before they write. Using a plan helps you be smarter about your work!



How to Be Smart: Planning

When we say people are smart, we usually mean that they know a lot of information. But being smart also means that someone has a lot of ability to learn new things. Being smart at learning new things includes knowing and using your *thinking abilities*. There are ways you can use your abilities *better* when you are learning.

What Does Being Smart Mean?

One ability that is very important is called *Planning*. The ability to *plan* helps you figure out *how to do things*. When you don't know how to solve a problem, using Planning ability will help you figure out how to do it. This ability also helps you control what you think and do. It helps you to stop before doing something you shouldn't do. Planning ability is what helps you wait until the time is right to act. It also helps you make good decisions about what to say and what to do.

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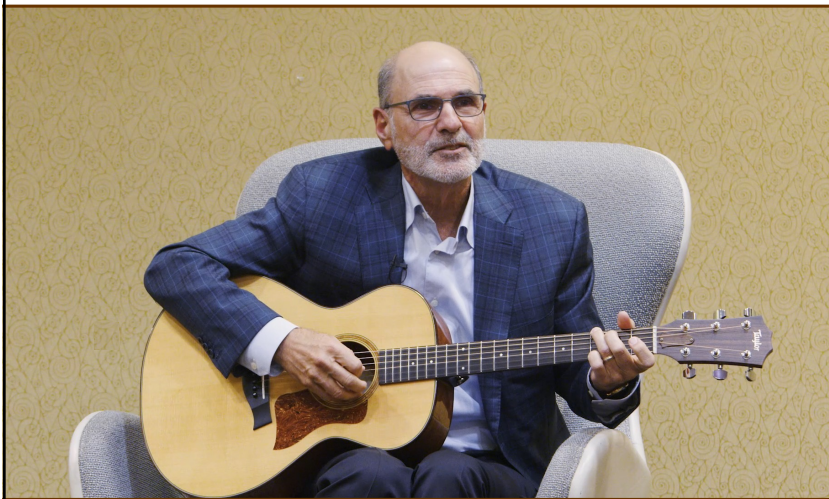
Questions about What I Just Presented?



Perguntas sobre o que eu apresentei?

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Maybe It's Time to Let the Old Ways Die



NYASP 2022 Legends
in School Psychology
Award

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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 – the MOST EQUITABLE intelligence test.
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 in combination with achievement provides examiners with a reliable and 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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