Equitable Cognitive Assessment Demands Socially Justice Solutions: Choose Wisely

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

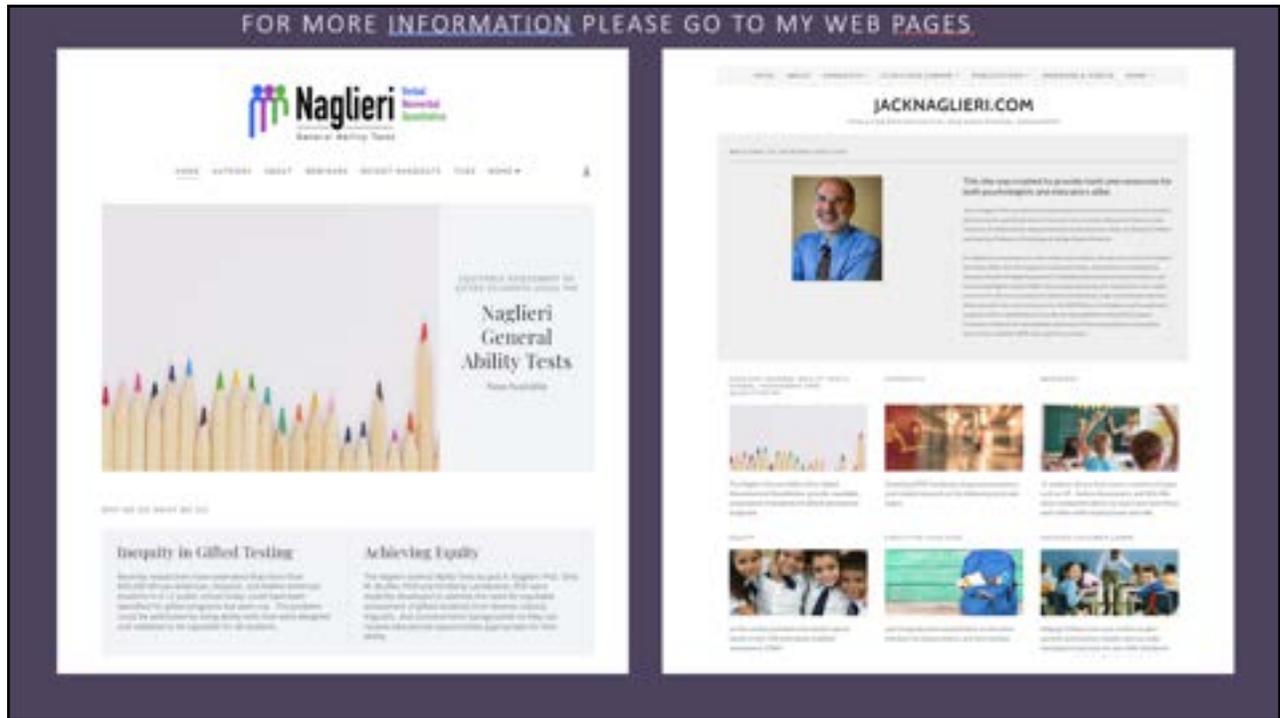jnaglieri@gmail.com   jacknaglieri.com   naglierigiftedtests.com
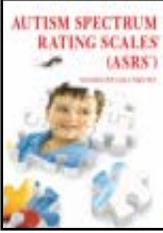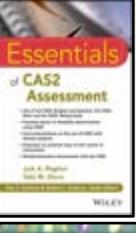
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Get Ready to Learn
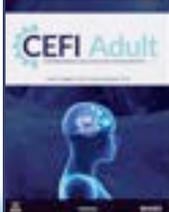
Mindful Breathing
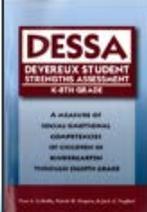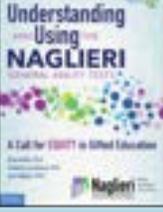

2

FOR MORE INFORMATION PLEASE GO TO MY WEB PAGES

Disclosures

Executive Function	Social Emotional	Autism	Gifted Identification	PASS Neurocognitive Theory: Assessment & Intervention Handouts		

Coming 2022 CAS2 Online Admin & Scoring

4

The **BIG** picture

- The comprehensive assessments we provide can alter the course of a student's life; making this one of the most important tasks we have.
- We want Intellectual assessment that
  ◦ Is consistent with IDEA and state regulations regarding SLD determination (PSW)
  ◦ Helps us understand WHY a student fails and informs intervention
  ◦ Can be used to identify a Pattern of Strengths and Weaknesses
  ◦ Is fair for students from diverse populations
- These goals can be achieved if we use second-generation tests that measure the way students THINK to LEARN
  ◦ The definition of THINKING should be based on BRAIN function
  ◦ PASS theory is a way of defining THINKING and the Cognitive Assessment System-2nd Edition measures a student's ABILITY to think

5

Ideas to Consider

→ **My 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 – Measure Thinking not Knowing
• To *g* or not to *g*

Did you ever wonder...
Why is there a Vocabulary and Arithmetic subtest on your *intelligence* test?

And similar questions on the achievement test

7

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

➢THAT DID NOT MAKE SENSE

1975 Charles Champagne Elementary, Bethpage, NY

8

How and Why…

- First job as assistant professor at Northern Arizona University - 1979
  - Lecture on Navajo Native Americans
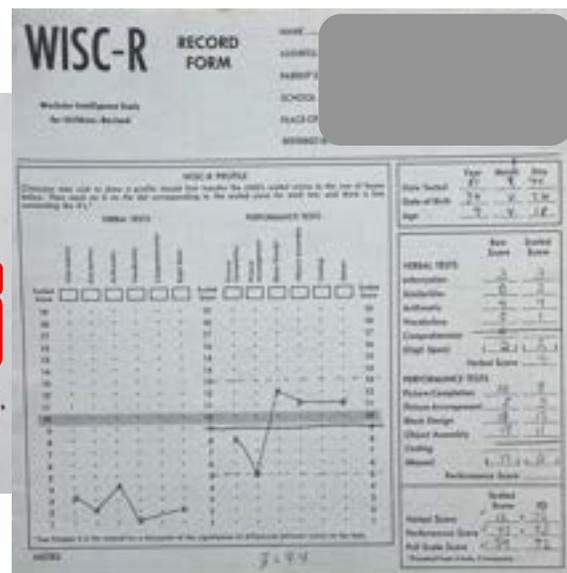 - Testing students in Supai, AZ

9

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.
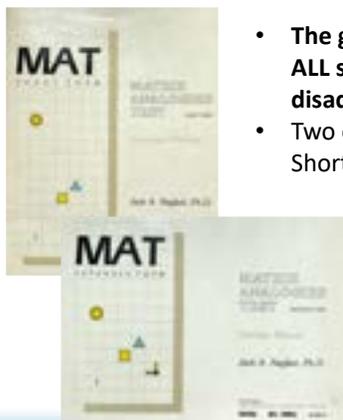

WISC-V Full Scale

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

10

10

Naglieri's Nonverbal Tests: 1985 to Present

➤ **First and Second** Versions

- The goal was to provide efficient ways to evaluate *general ability* for ALL students and especially "intellectually gifted children from disadvantaged backgrounds (Naglieri, 1985, p. 3)."
- Two options: The MAT: Expanded Form for individual and the MAT: Short Form for group administration.

Validity Results:
1. **Males Females differences were trivial** (< 1 point) on MAT:EF (452) & MAT:SF (N = 2,636)
2. **Differences by Race were trivial (< 1 point) on MAT:EF (N = 110) and MAT:SF (N = 672)**
3. **MAT:SF correlations with reading and math achievement were substantial across grades K-12** (N = 3,022)

MAT Short and Expanded Forms 1985

11

Naglieri's Nonverbal Tests: 1985 to Present

➤ **Research on Six** Versions of the Naglieri Nonverbal Tests

Each of these versions of the NNAT showed similar scores by RACE, ETHNICITY, & SEX and had strong correlation with achievement

MAT Short and Expanded Forms 1985   Naglieri Nonverbal Ability Test 1997   NNAT –Individual, 2003   NNAT -2 2008   NNAT3 2016

This research convinced me that measuring intelligence using test questions that measured how well a student can think was a valid and equitable way to measure general intelligence 'g'.

12

6

Tests that Measure Thinking or Knowing?

Girl is woman as boy is to <u>man</u>?

3 is to 9 as 4 is to <u>16</u>?

C^7 is to F as E^7 is to <u>A</u>?

13

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

My career as a test developer began with this goal

Why do we measure intelligence the way we do?

The History of IQ tests

Stanford-Binet → Army Mental Tests → Today

When working on the 1911 scale, Binet removed items from 1908 scale because 'they depended too much on school learning'

A. Binet

Terman added items dependent upon school learning in the 1916 Stanford-Binet because he believed 'intelligence at the verbal and abstract levels is the highest form of mental ability'.

L. Terman

Wechsler based his intelligence test on the U.S. Army Mental Tests (Verbal, Quantitative & Nonverbal)

Arthur Otis (Terman's student) was instrumental in the development of the U.S. Army Alpha (Verbal & Quantitative) and Beta (Nonverbal), the Otis-Lennon Ability Test and known for the multiple-choice format

16

Alpha & Beta → Wechsler

➤ **Army Alpha**
- Synonym- Antonym
- Disarranged Sentences
- Number Series
- Arithmetic Problems
- Analogies
- Information

→ Verbal & Quantitative IQ (Knowledge)

➤ **Army Beta**
- Maze
- Cube Imitation
- Cube Construction
- Digit Symbol
- Pictorial Completion
- Geometrical Construction

→ Nonverbal IQ (Thinking)

→ WISC, WJ CogAT & Otis-Lennon

17

Very Similar Items on "Different" WJ Tests

18

Knowledge is Included in "Ability" Tests

Stanford-Binet-5	WISC-V	WJ-IV	KABC-II	OLSAT	CogAT
• Verbal • Knowledge • Quantitative Reasoning • Vocabulary • Verbal Analogies	• Verbal Comprehension Vocabulary, Similarities, Information & Comprehension • Fluid Reasoning Figure Weights, Arithmetic	• Comprehension Knowledge: Vocabulary & General Information • Fluid Reasoning: Number Series & Concept Formation • Auditory Processing: Phonological Processing	• Knowledge / GC • Riddles, • Expressive Vocabulary, • Verbal Knowledge	• Verbal • Following directions • Verbal Reasoning • Quantitative • Verbal Arithmetic Reasoning	• Verbal Scale • Analogies • Sentence Completion • Verbal Classification • Quantitative • 45 pages of oral instructions

19

Academic Learning Loss & COVID

- COVID-19 has increased the impact of disparities in access and opportunity for students of color and they are even further behind than they were before.
- Their **scores on traditional intelligence tests** which demand knowledge **are even more inaccurate.**
- **Solutions**:
  - For traditional tests, use post-COVID norms only.
  - Use intelligence tests that are not dependent upon knowledge

Education in a Pandemic: The Disparate Impacts of COVID-19 on America's Students. US Dept. of Ed- Office of Civil Rights. June, 21, 2021. https://www2.ed.gov/about/offices/list/ocr/docs/20210608-impacts-of-covid19.p

20

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* (because it penalizes students for not knowing the answers) **even if the norming data do not demonstrate test bias.**

➤ Evidence of EQUITY is examined by test content and mean score differences

Equity

Bias

21

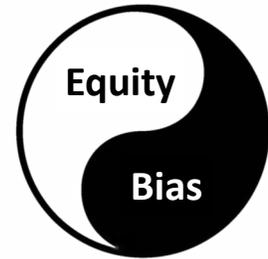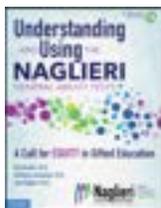### Race and Ethnic Differences for *Traditional* and *Second-Generation* Intelligence Tests

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-Dynega, Ortiz, Flanagan, and Chaplin (2013); CogAT7 by Carman, Walther and Bartsch (2018) and Lohman (2016), WISC-V by Kaufman, Raiford, and Coalson (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 Lansdowne (2022).

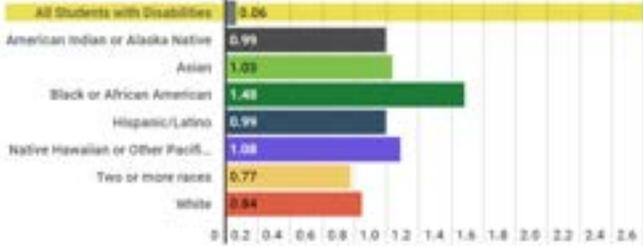|	By Race	By Ethnicity
Tests that require knowledge	**Mn = 9.4**	**Mn =6.6**
Otis-Lennon School Ability Test (district wide)	13.6	
Stanford-Binet IV (normative sample)	12.6	
WISC-V (normative sample)	11.6	
WJ- III (normative sample)	10.9	10.7
CogAT7 Nonverbal	11.8	7.6
CogAT7 - Verbal	6.6	5.3
CogAT7-Quantitative	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

22

Slide 23

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

Category	Risk Ratio
All Students with Disabilities	3.06
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.
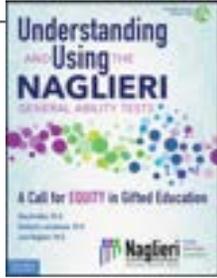
https://sites.ed.gov/idea/osep-fast-facts-race-and-ethnicity-of-children-with-disabilities-served-under-idea-part-b/
https://ldaamerica.org/lda_today/disproportionate-identification-of-students-of-color-in-special-education/

23

Slide 24

Numbers of Gifted Students Missed = **1,235,434**

Total Enrollments by Race and Ethnicity as of 2020.

	N in Public Education K-12 in 2020	N Potentially Gifted (8%; 92 %tile)	N Students in gifted programs	Difference Between Potential and Identified
White	23,834,458	1,906,757	1,937,350	30,593
Black	7,754,506	620,360	330,774	-289,586
Hispanic	14,337,467	1,146,997	600,498	-546,499
Native American/ Alaska Native	484,766	38,781	27,712	-11,069
Two or More Races	1,641,817	131,345	105,371	-25,974
Total Non-Whites	24,218,556	1,937,484	1,064,355	-873,129

873,129 +

Understanding and Using the NAGLIERI GENERAL ABILITY TESTS — A Call for EQUITY in Gifted Education

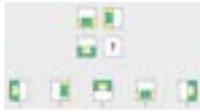|	
Percent of Schools that do not Identify	41.5%
Additional non-white gifted students = 41.5% of 873,129	N = 362,305
Total non-white gifted students missed	N = 1,235,434

24

12

Research Evidence of Equity

Selvamenan, M., Paolozza, A., Solomon, J., Naglieri, J. A., & Schmidt, M. T. (submitted for publication, Nov. 2020). Race, Ethnic, Gender, and Parental Education Level Differences on Verbal, Nonverbal, and Quantitative Naglieri General Ability Tests: Achieving Equity.
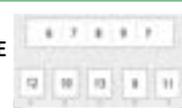
NONVERBAL TEST

- N= 3,630 Sample closely matches the US population on key demographics
- **No GENDER differences** found between **males** and **females** for raw score across all forms
- **No RACE/ETHNICITY differences** among **White, Black, & Hispanic** for raw score across all forms
- **No PARENTIAL EDUCATIONAL differences** among five education levels (No high school diploma; High School graduate; Some college/Associate's degree; Bachelor's degree; Graduate/professional degree) for raw score across all forms

VERBAL TEST

- N= 2,482 Sample closely matches the US population on key demographics
- **No GENDER differences** found between **males** and **females** for raw score across all forms
- **No RACE/ETHNICITY differences** among **White, Black, & Hispanic** for raw score across all forms
- **No PARENTIAL EDUCATIONAL differences** among five education levels (No high school diploma; High School graduate; Some college/Associate's degree; Bachelor's degree; Graduate/professional degree) for raw score across all forms

QUANTITATIVE TEST

- N= 2,841 Sample closely matches the US population on key demographics
- **No GENDER differences** found between **males** and **females** for raw score across all forms
- **No RACE/ETHNICITY differences** among **White, Black, & Hispanic** for raw score across all forms
- **No PARENTIAL EDUCATIONAL differences** among five education levels (No high school diploma; High School graduate; Some college/Associate's degree; Bachelor's degree; Graduate/professional degree) for raw score across all forms

25

We do the best we can with what we know, and when we know better, we do better.

— Maya Angelou —

Questions and Thoughts Please

27

Ideas to Consider

My 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 – Measure Thinking not Knowing
- To g or not to g

Shift from Traditional To Second-Generation Intelligence Tests

→ Wechsler, et al

→ **C**ognitive **A**ssessment **S**ystem 2nd Edition

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 andwe began development of the **C**ognitive **A**ssessment **S**ystem (Naglieri & Das, 1997).

April 2018

➤ We conceptualized intelligence as Planning, Attention, Simultaneous, and Successive (PASS) neurocognitive processes based on Luria's concepts of brain function.

30

PASS Neurocognitive Theory

➢**P**lanning = THINKING ABOUT HOW YOU 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 = 'basic psychological processes'

NOTE: Easy to understand concepts!

31

PASS Theory

IS EASILY EXPLAINED TO TEACHERS, PARENTS AND MOST IMPORTANTLY THE STUDENTS

Telling Frankie about his PASS scores
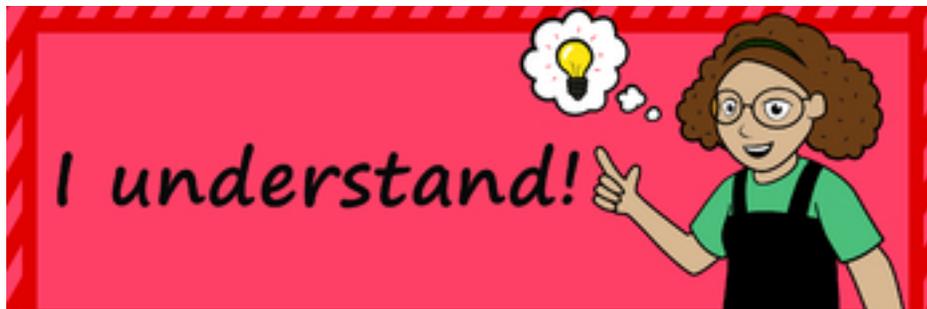
➤ Frankie was struggling in school at age 11

➤ Referred by parents after a history of reading and self esteem problems

➤ High level of anxiety
- he was too anxious to look closely at the words
- he rushed to get tasks completed
- Frankie could not attend to the details of the sequence of letters for correct spelling, and the order of sound–symbol associations

Figure 3.4. Frankie's self-portrait.

33

Frankie's Discrepancy Consistency Results

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

Significant Discrepancy

Significant Discrepancy

Plan (94), Sim (94), Succ (92), Math Calc (104); PPVT–III=111

Scores of 81 (LWid), 86 (Comp), 85 (WA), WRAT-3 Spell=83

Cognitive Weakness in Attention (71)

Consistency

34

: 12/7/22

Frankie: Then   and Now

- I informed Frankie of his PASS scores, and everything changed
- He learned to manage his attention problem by using good Planning which helped him
  - recognize when he is off task
  - Think of ways to manage his attention
  - recognize when he needed a change in the environment to reduce distractions
- Perhaps most importantly: He was given hope – that he could succeed

- ➤ Frankie graduated High School and went to college
- ➤ Is married with children
- ➤ He is a graphic designer
- ➤ He uses his good Planning, Simultaneous and Successive processing to manage any obstacles he may still have with attention

35

PASS Theory Based on Brain Function – Planning, Attention, Simultaneous and Successive Neurocognitive processes

Figure 1.2 Three Functional Units and Associated Brain Structures
From: *Essentials of CAS2 Assessment*. Naglieri & Otero, 2017

18

PASS Theory: Planning

➢ Planning is a term used to describe a neurocognitive function similar to metacognition and executive function

➢ Planning is needed for setting goals, making decisions, predicting the outcome of one's own and others actions, impulse control, strategy use and retrieval of knowledge

➢ Planning helps us make decisions about how to solve any kind of a problem from academics to social situations and life in general

➢ Math calculation, written expression, etc

37

Planned Codes Page 1

▸ 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"

38

CAS2: Rating Scale Planning

39

PASS Theory Based on Brain Function -– Attention

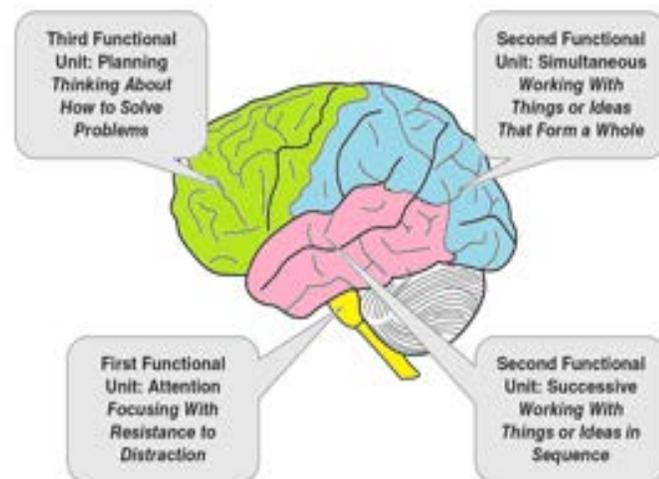Figure 1.2 Three Functional Units and Associated Brain Structures

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

PASS Theory: Attention

> Attention is a basic psychological process we use to
> - selectively attend to some stimuli and ignores others
> - Focus our cognitive activity
> - Selective attention
> - Resistance to distraction
> - Listening, as opposed to hearing

BLU VERDE GIALLO

빨강 파랑 초록 노랑

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

41

Jose: Age 10, 5th Grade, Bilingual Student by Tulio M. Otero, Ph.D.

Jose reading problems and the teacher these concerns:

phonemic awareness, reading fluency, reading comprehension math problem-solving, spelling, written expression

Jose also receives ELL services and his current ACCESS scores are as follows: Listening 5.8, Speaking 1.9, Reading 2.8, Writing 3.5.

2018 WISC4 Spanish : VCI 55, PRI 92, WM 86, PS 91

42

21

CAS2 and KTEA-III Scores (January 2020)

PASS and Full Scale Scores

Planning	105
Simultaneous	91
Attention	79
Successive	94
Full Scale	90

(scale: 40 50 60 70 80 90 100 110 120)

Spelling	73
Math Composite	90
Applied Math Problems	93
Calculation	89
Reading Composite	76
Reading comprehension	71
Letter & Word Recognition	73

(scale: 40 50 60 70 80 90 100 110)

43

Jose was given this simple intervention

Remember to check how well you are attending. If you are having a problem, use a plan and look at this (taped to his desk).

From: Naglieri, J. A., & Pickering, E. B. (2010). *Helping Children Learn: Intervention Handouts for Use at School and Home (Second Edition).* Baltimore, MD: Brookes Publishing.

Think smart and look at the details!

L👀K at the details.

Figure 1. A graphic that reminds students to focus on information being discussed.

44

Two weeks later!

- Teacher reported that José has increased his reading accuracy by at least 80%.
- He read 16 words correctly out of a list of 20.
- He has done this over the last 3. sessions.

Think smart and look at the details!
LⓄⓄK

PASS Theory Based on Brain Function - Simultaneous Processing

Third Functional Unit: Planning
Thinking About How to Solve Problems

Second Functional Unit: Simultaneous Working With Things or Ideas That Form a Whole

First Functional Unit: Attention Focusing With Resistance to Distraction

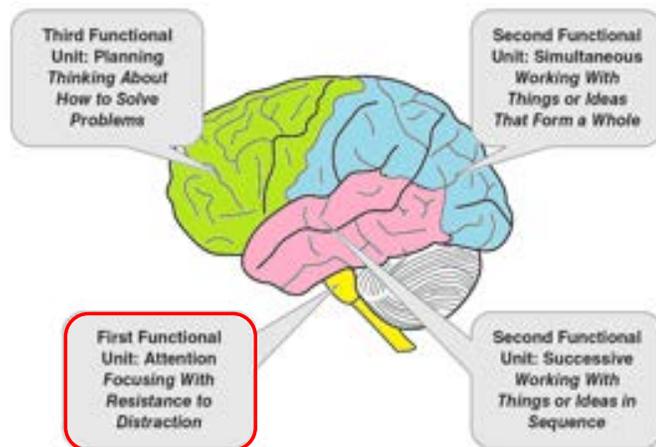Second Functional Unit: Successive Working With Things or Ideas in Sequence

Figure 1.2 Three Functional Units and Associated Brain Structures

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

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

Which picture shows a ball under the table?

47

PASS Theory Based on Brain Function – Successive Processing

Figure 1.2 Three Functional Units and Associated Brain Structures

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

PASS Theory: Successive

▶ **Successive** processing is a basic psychological process we use to manage stimuli in a specific serial order
- Word Recall
- Number Recall
- Sentence Questions

- Stimuli form a chain-like progression
- Decoding words
- Letter-sound correspondence
- Phonological tasks
- Understanding the syntax of sentences
- Comprehension of written instructions

Recall of Numbers in Order
Successive Processing

4 3 8 6 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?*

49

We do the best we can with what we know, and when we know better, we do better.

— Maya Angelou —

Change
Demands
**Courage to
Think Differently**

Ideas to Consider

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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

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 in 2022

52   52

CAS2, CAS2 Online Score and Report Write, CAS2-Espanol, CAS2: Brief, CAS2 Rating Scale

➢ This book is the most complete discussion of PASS theory and its measurement

➢ Chapters cover all versions of the CAS2 as well as the online scoring and report writer

➢ Administration, scoring, interpretation

➢ Reliability, validity (PASS profiles, evidence of test fairness,

➢ Discrepancy Consistency Method for SLD

➢ Intervention planning and clinical case studies

53

Questions and Thoughts Please

54

Ideas to Consider

My 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 – Measure Thinking not Knowing
- To *g* or not to *g*

PASS Scores for Hispanics
Naglieri, Rojahn, Matto (2007)

WJ-III and ELL Hispanic Students
(Sotelo-Dynega, Ortiz, Flanagan & Chaplin, 2013)

Hispanic White difference on CAS Full Scale of **4.8**

11-point mean score difference in GAI

As English skills go down so does the GAI

56

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

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

➢ Very similar scores in English and Spanish versions of CAS

➢ >**90% agreement** between PASS weakness & strengths using English and Spanish CAS in **BOTH** studies

57

CAS in Italy

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

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

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

58

Support for 'g'

➢ …The small portions of variance uniquely captured by [subtests]… render the group factors [scales]of questionable interpretive value independent of g (FSIQ general intelligence)

➢ Present CFA results confirm the EFA results (Canivez, Watkins, & Dombrowski, 2015); Dombrowski, Canivez, Watkins, & Beaujean (2015); and Canivez, Dombrowski, & Watkins (2015).

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

59

Research Supports 'g' but little More

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

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

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

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

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

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

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

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

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

60

Support for PASS Scales

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

➢ "…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)
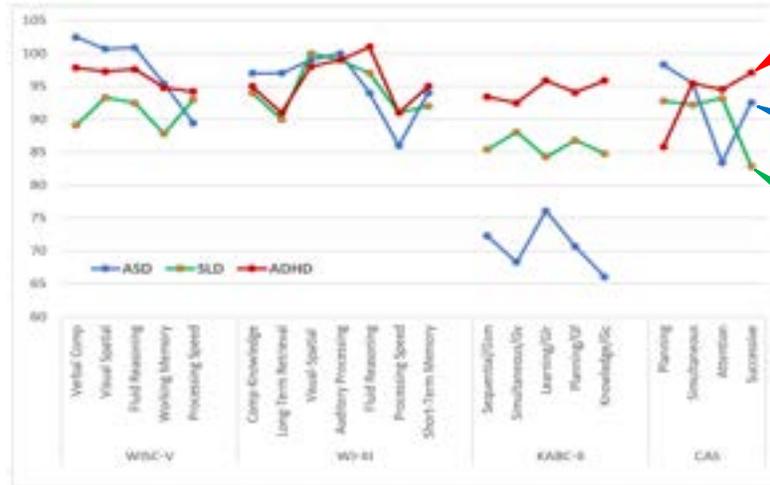
61

PASS

➢Given that PASS scales CAN be interpreted it is important to know
- if these scales yield PROFILES that can be used in a Pattern of Strengths and Weaknesses approach to eligibility determination AND
- do PASS scores relate to achievement more than traditional intelligence tests?

62

Patterns of Strengths & Weaknesses

ADHD (Low Planning)

ASD – Low Attention

Dyslexia – Low Successive

These profiles across tests is very revealing - PASS works

PASS Research

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.*

➤ "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…"

NASP Professional Standards 2020

NASP 2020 Professional Standards

GUIDING PRINCIPLE I.3 FAIRNESS, EQUITY, AND JUSTICE

In their words and actions, school psychologists promote fairness and social justice. They use their expertise to cultivate school climates that are safe, welcoming, and equitable to all persons regardless of actual or perceived characteristics, including race, ethnicity, color, religion, ancestry, national origin, immigration status, socioeconomic status, primary language, gender, sexual orientation, gender identity, gender expression, disability, or any other distinguishing characteristics.

Standard I.3.2 Correcting Discriminatory Practices

School psychologists strive to ensure that all children and youth have equal opportunity to participate in and benefit from school programs and that all students and families have access to and can benefit from school psychological services. They work to correct school practices that are unjustly discriminatory or that deny students or others their legal rights. School psychologists take steps to foster a school climate that is supportive, inclusive, safe, accepting, and respectful toward all persons, particularly those who have experienced marginalization in educational settings.

School psychologists function as change agents, using their skills in communication, collaboration, and consultation to advocate for necessary change at the individual student, classroom, building, district, state, and national levels.

65

We do the best we can with what we know, and when we know better, we do better.

— Maya Angelou —

Change Demands **Courage to Think Differently**

Socially just assessment requires self-reflection and self-correction in response to the science
so Chose Wisely!

Questions and Thoughts Please

67

Maybe It's Time to Let the Old Ways Die

NYASP 2022 Legends in School Psychology Award Interview

68