An Equitable Way to Identify All Gifted Students: Measure Thinking not Knowing

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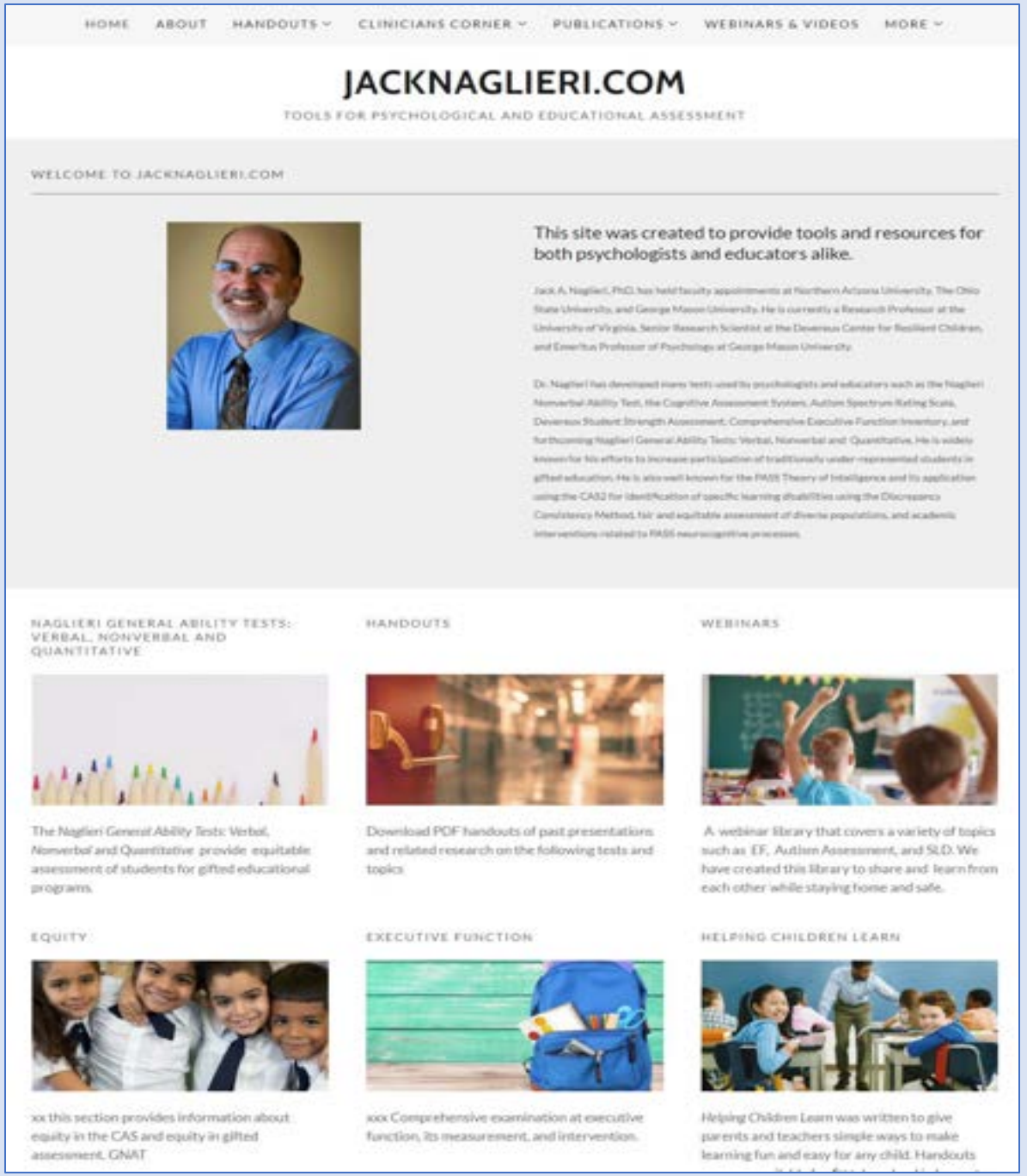
For 2E Assessment

- Gifted students who also have a disability such as ADHD, SLD or ASD



Website

YouTube

Instagram

Ideas to Consider

- My equity journey
- New tests of General Ability
- What is General Ability
- Identification of gifted students
- Local and National Norms
- Twice Exceptional gifted students with
  - SLD
  - ADHD
  - ASD
- PASS validity, profiles and interpretation

WHY do I do this work?

- When I started working as a school psychologist in 1975…I noticed that parts of the intelligence tests we used were VERY similar to parts of the achievement tests
  - For example, the Achievement Test had a General Information and Arithmetic subtests JUST LIKE THE WISC!
- THAT DID NOT MAKE SENSE

1975 Charles Champagne Elementary, Bethpage, NY

It seemed wrong to measure intelligence using questions that demand knowledge

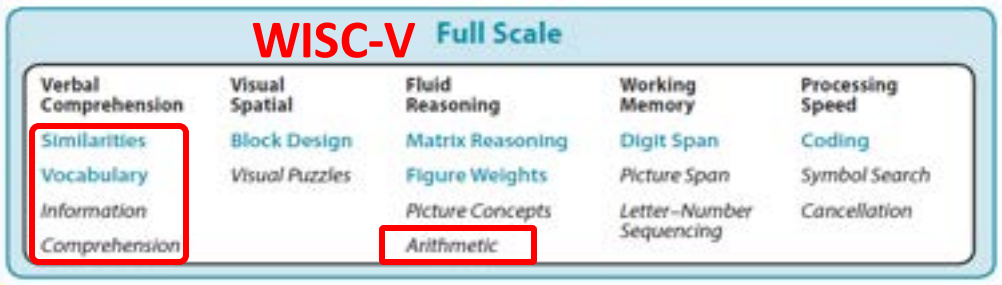
- Was it reasonable to measure ‘intelligence’ with questions that required knowledge?
- Testing in Havasupai answered that question

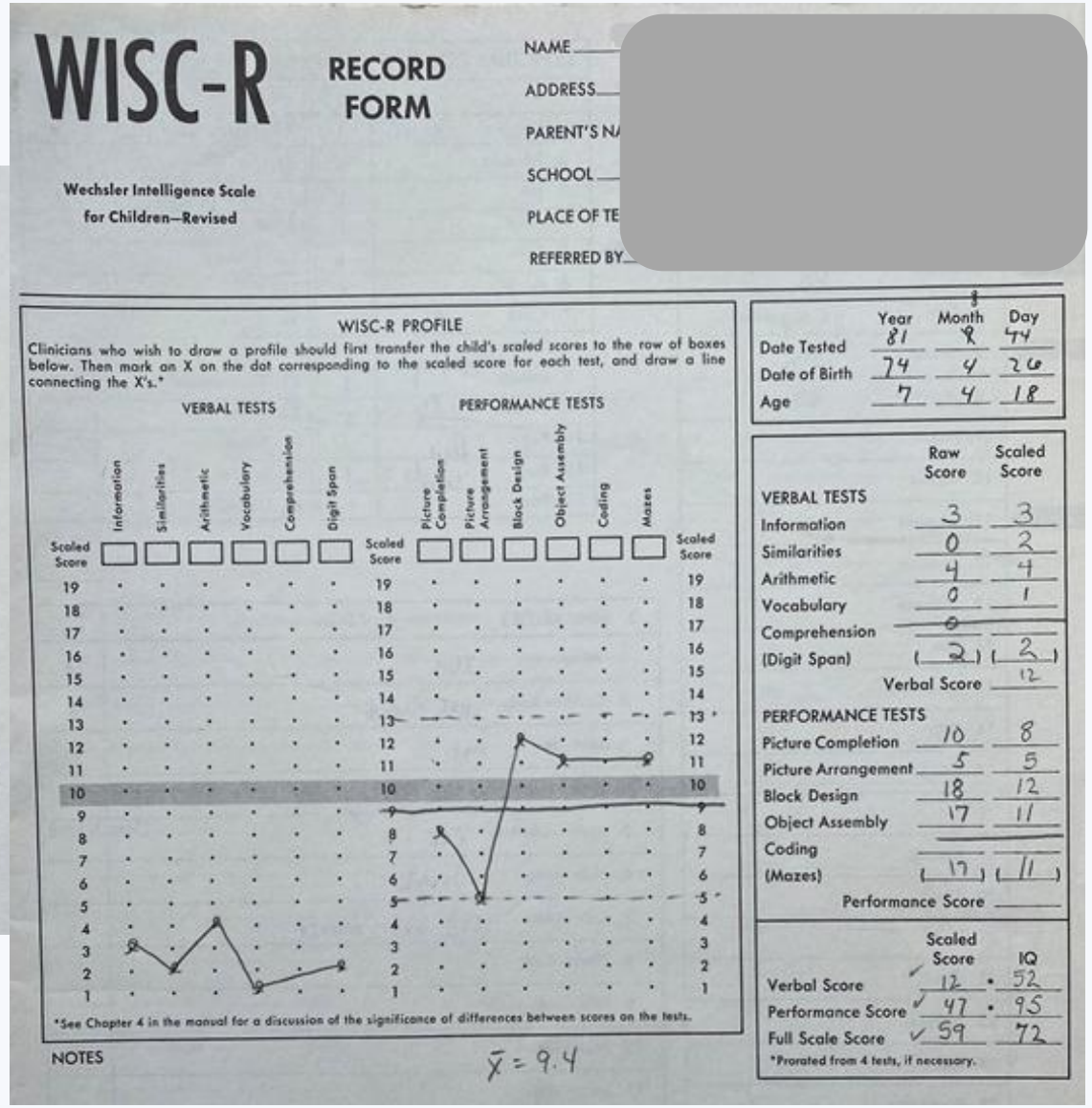
1981

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.





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

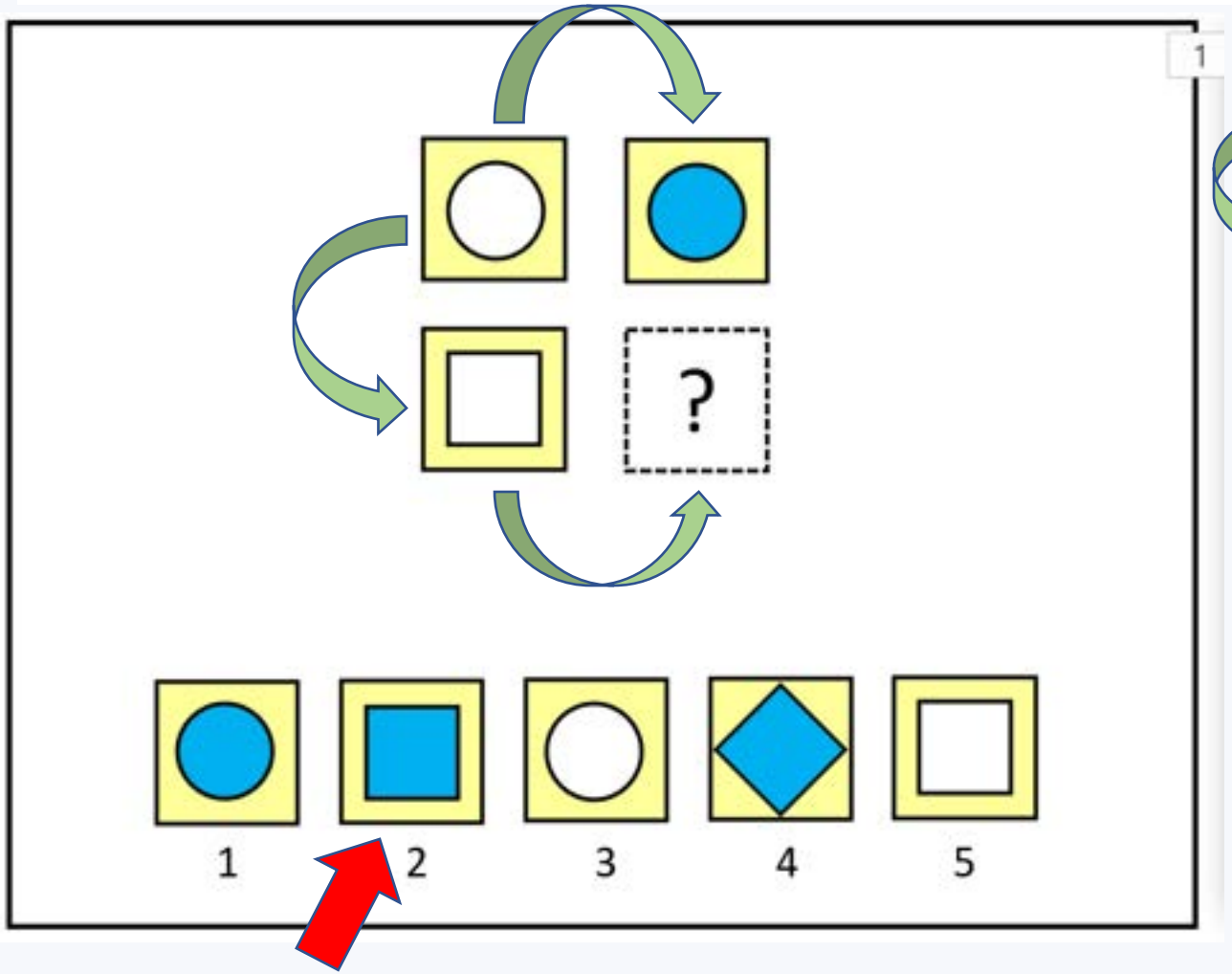
Naglieri, J. A., & Yazzie, C. (1983). Comparison of the WISC-R and PPVT-R with Navajo children. *Journal of Clinical Psychology, 39*, 598-600.

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

How to achieve this goal?

My career as a test developer began with this goal

Tests that Measure Thinking or Knowing?



Girl is woman as
boy is to man ?

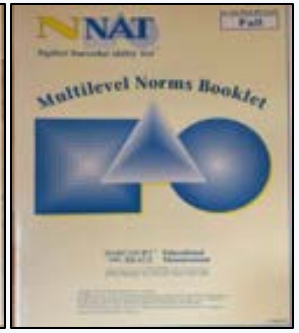
3 is to 9 as
5 is to 25 ?

C^7 is to F as
E^7 is to A ?

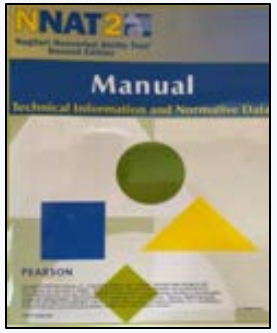
How and Why…

- First Research Article
  - Naglieri, J. A. (1982). Does the WISC-R measure verbal intelligence for non-English speaking children? *Psychology in the Schools, 19*, 478-479.
- Tests and books
  - Matrix Analogies Tests Individual and Group administrations (1985)
  - NNAT editions – 1997-2016
  - CAS and CAS2 – 1997-2014
  - GAMA
  - Essentials of CAS Assessment 1999
  - Helping All Gifted Students Learn (Naglieri, Brulles & Lansdowne, 2009)
  - Naglieri General Ability Test (2022)

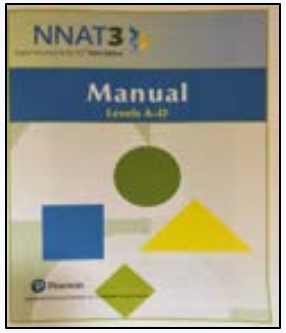
1985 MAT Short and Expanded Forms



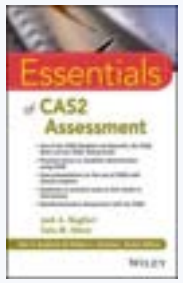
Naglieri Nonverbal Ability Test in 1997

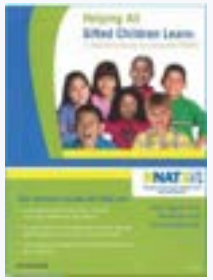


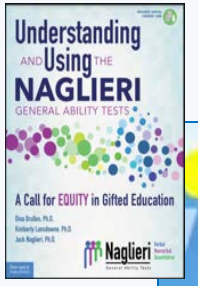
NNAT -2 published in 2008

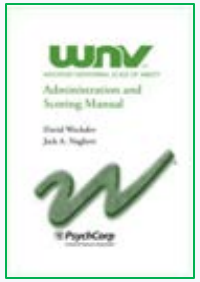


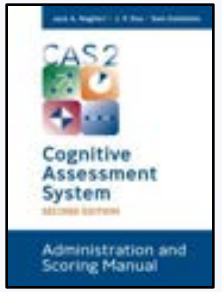
NNAT -3 published in 2016







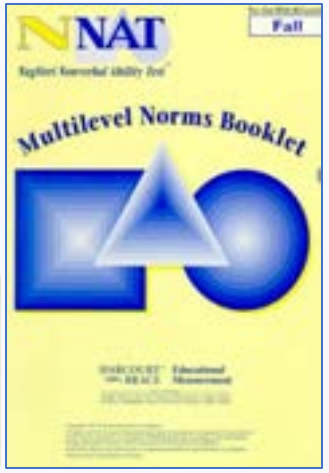




Naglieri's Nonverbal Tests : 1985 to Present

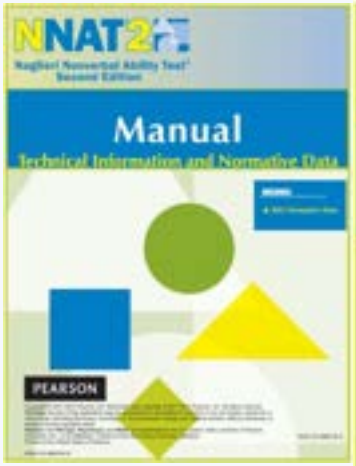
- **Sixth Version of the Naglieri Nonverbal Tests**

MAT Short and Expanded Forms 1985

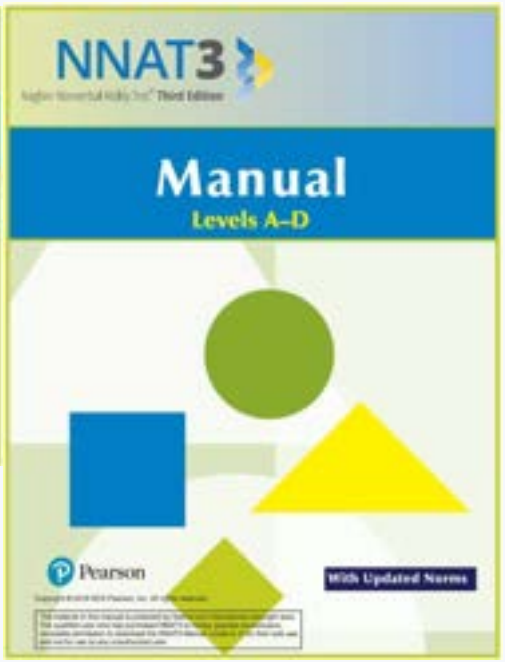


Naglieri Nonverbal Ability Test 1997

NNAT –Individual, 2003



NNAT-2 2008



The **NNAT3 (2016)** was created to provide new items and updated norm group

The NNAT3 Validity:

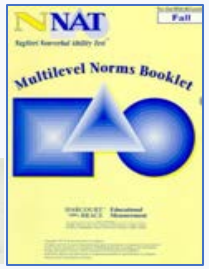
- No difference between online & paper
- The NAI scores correlated with the OLSAT 8 suggesting that the two tests measure general ability.

BUT… there was a lingering question: What about adding Verbal and Quantitative tests of general ability to compliment the Naglieri Nonverbal Ability Test?

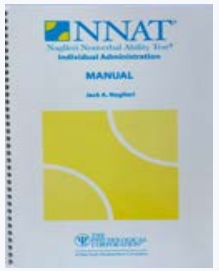
Naglieri's Nonverbal Tests : 1985 to Present

- **Seventh Version of the Naglieri Nonverbal Tests**

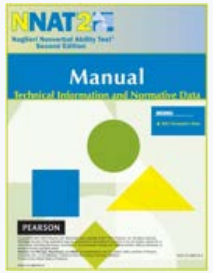
MAT Short & Expanded Forms 1985



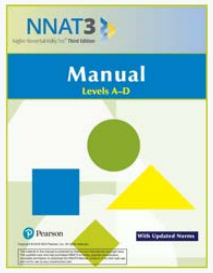
Naglieri Nonverbal Ability Test 1997



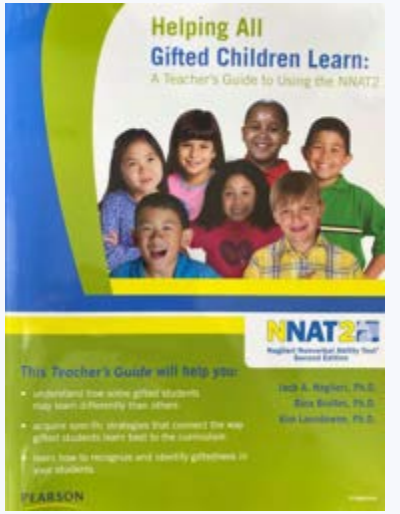
NNAT – Individual, 2003



NNAT-2 2008



NNAT3 2016



Naglieri General Ability Tests: Verbal, Nonverbal and Quantitative (2021) were developed to measure *general ability* using three different kinds of test content: Verbal, Nonverbal and Quantitative.

Ideas to Consider

- My equity journey
- New tests of General Ability
- What is General Ability
- Identification of gifted students
- Local and National Norms
- Twice Exceptional gifted students with
  - SLD
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Our Goal: Identify **all Gifted** Students

- Gifted = very smart
- Talented = very accomplished
- Identification is based on referrals by teachers and parents
- Traditional ability tests comprised of
  - Verbal *directions* that include many verbal concepts and verbal comprehension
  - verbal and quantitative test items *demand knowledge*
  - Oral response demands *expressive language skills*
- Using a test of *ability* that demands *knowledge* is not reasonable
- Universal testing ensures that all students have an opportunity

Naglieri General Ability Tests

- We **explicitly made tests for equitable identification** of students from diverse cultural, linguistic, or socioeconomic backgrounds
- We used the traditional Verbal, Nonverbal and Quantitative formats to **measure general ability** and to ensure equity we used:
  - Test questions that do not require academic knowledge,
  - Verbal and Quantitative test questions that can be solved using any language,
  - Animated instructions remove the need for comprehension of directions,
  - A multiple-choice response removes the need for verbal expression.
  - Online (and paper) administration for group or individual assessment
  - Universal assessment using local norms

Measuring General Ability Equitably Using the Naglieri General Ability Tests: Verbal, Nonverbal and Quantitative

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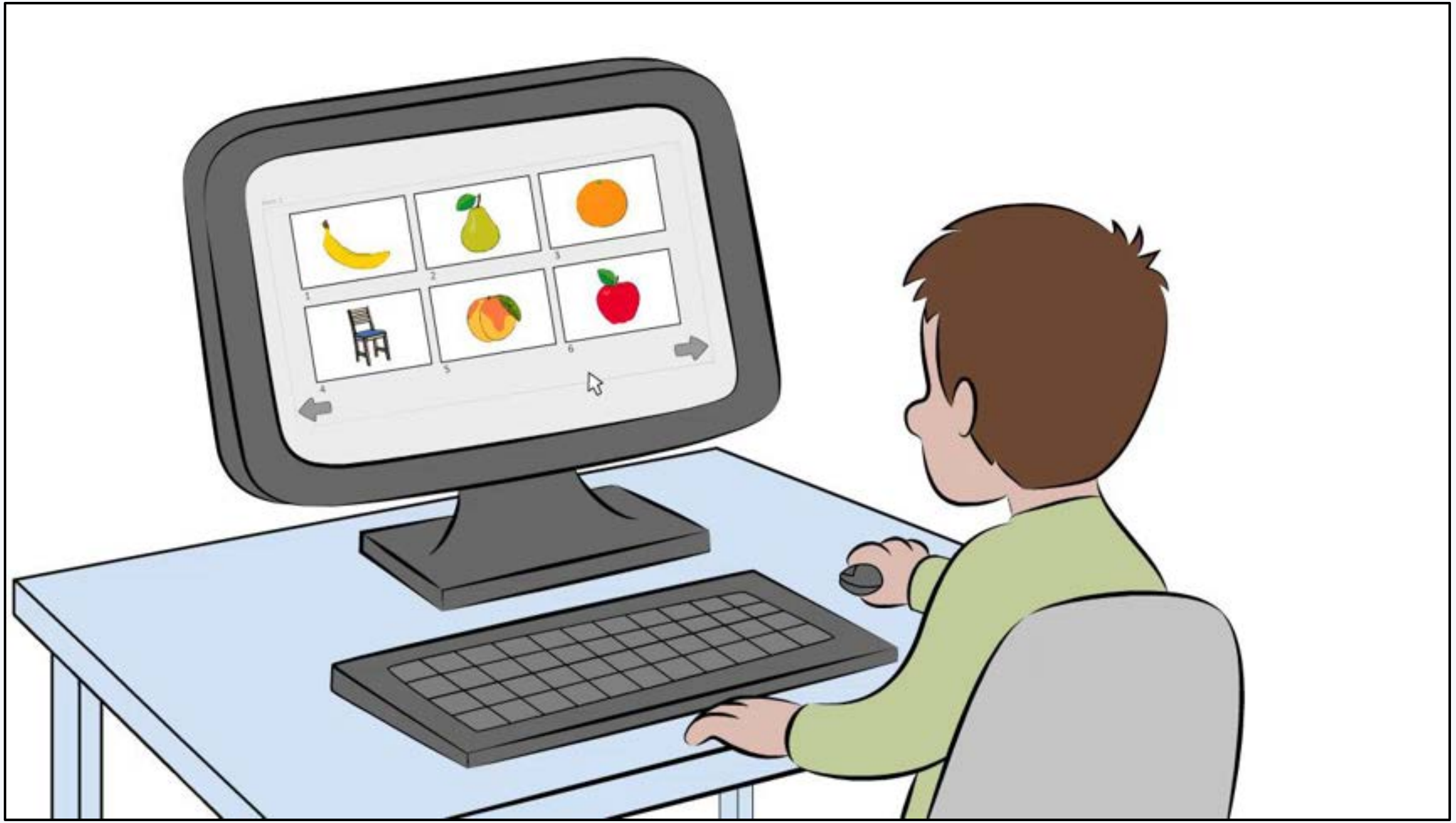
Kim Lansdowne, Ph.D. Kimberly.Lansdowne@asu.edu

Naglieri General Ability Test – Verbal (Naglieri & Brulles)

The **Naglieri–V measures general ability** using pictures of objects representing verbal concepts. The items are comprised of universally recognized pictures that do not rely on knowledge acquired in academic settings.

The student's task is to identify which of the six pictures does *not* represent the verbal concept shared by the other five.

The test items require close examination of *the relationships among the pictures*.



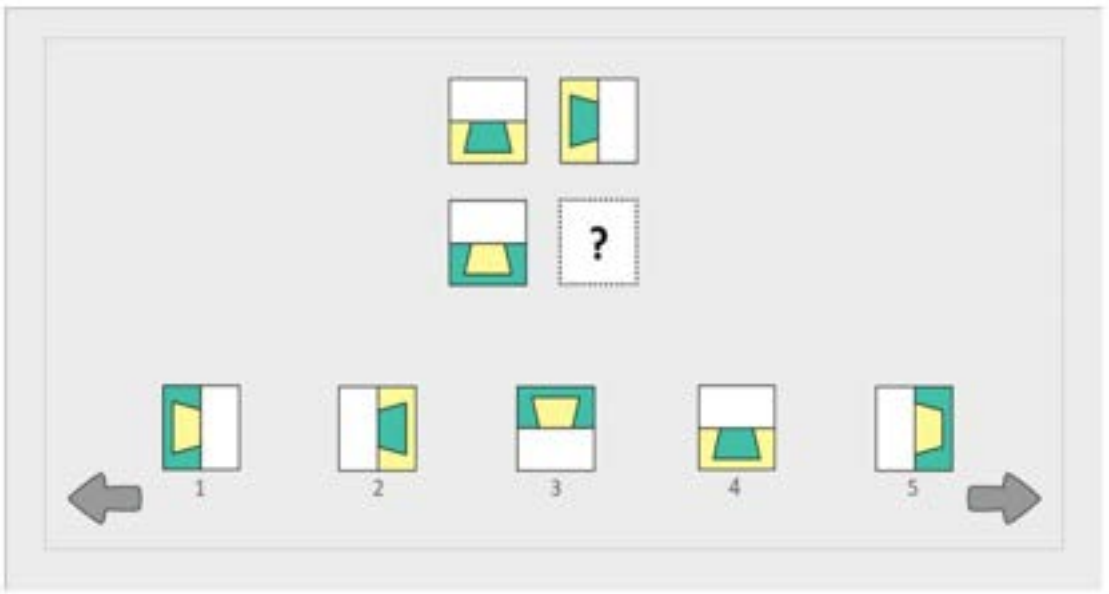
Naglieri General Ability Test - Nonverbal

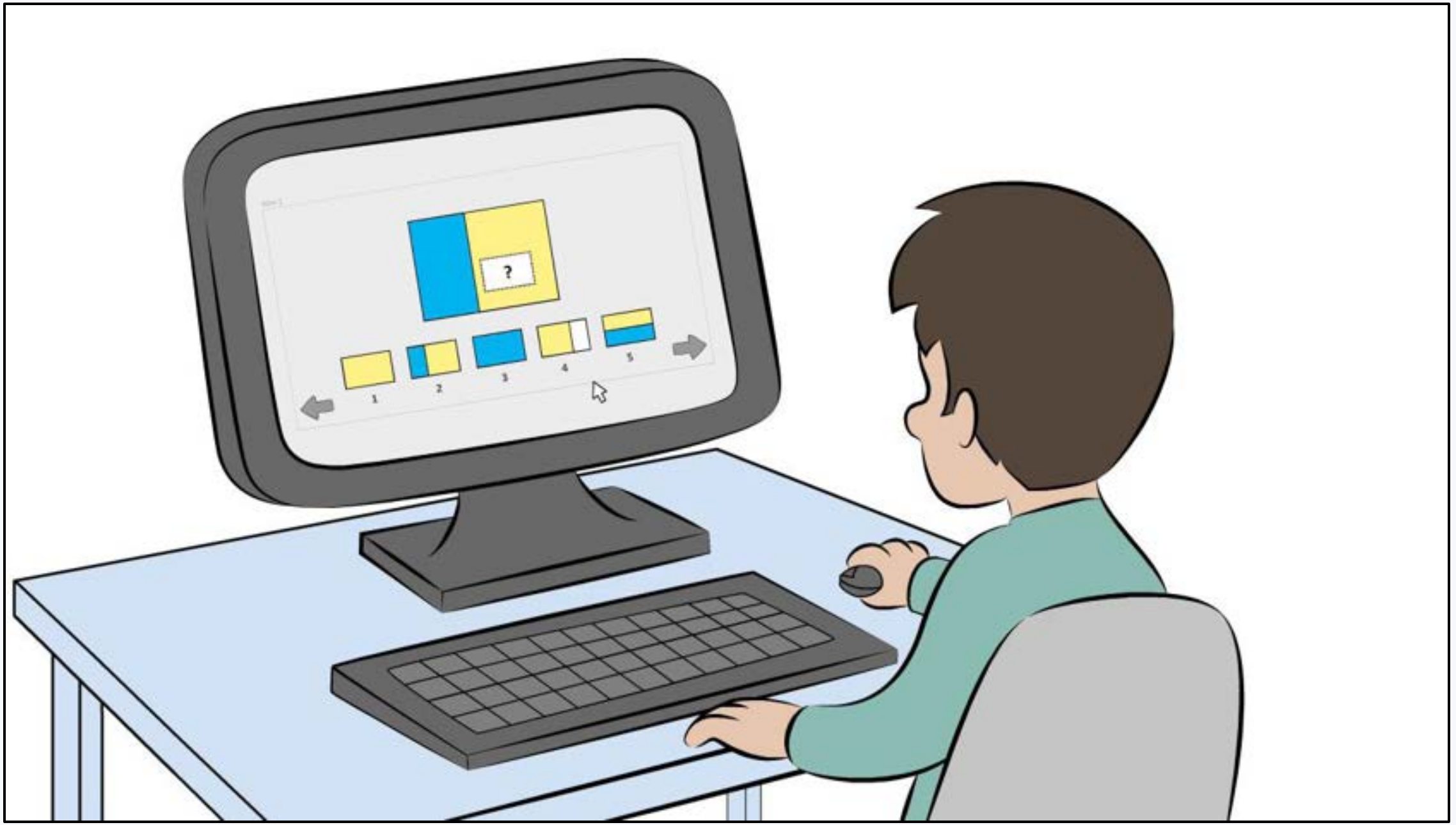
The **Naglieri–NV measures general ability** using questions that require a student to recognize the relationships among the shapes.

The structure of the items varies, but all items require that the student decipher the logic behind *the relationships among the shapes*, sequences, spatial orientations, patterns, and other distinguishing characteristics.

This nonverbal test is conceptually similar to the NNAT3 but it contains many NEW kinds of items not included before.

Naglieri General Ability Tests | Nonverbal




?
1
2
3
4
5

Naglieri General Ability Test – Quantitative
(Naglieri & Lansdowne)

The Naglieri–Q **measures general ability** using numbers and/or symbols. Students must decipher the logic behind *the relationships among the numbers and symbols* to identify the answer.

Items require the student to determine equivalency of simple quantities, analyze a matrix of numbers and solve mathematical sequences,

Items require minimal academic knowledge, and the calculation requirements are simple.

The items have no verbal requirements (i.e., no math word problems) so that they can be solved regardless of the language used by the student.


?
A
B
C
D
E

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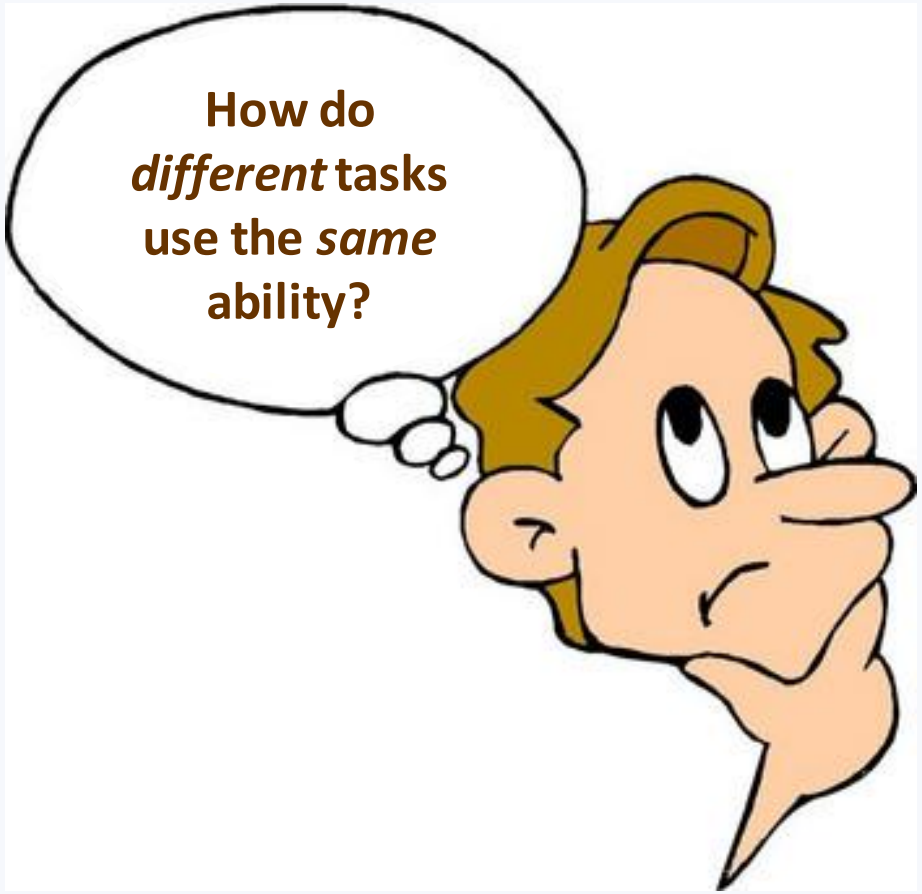
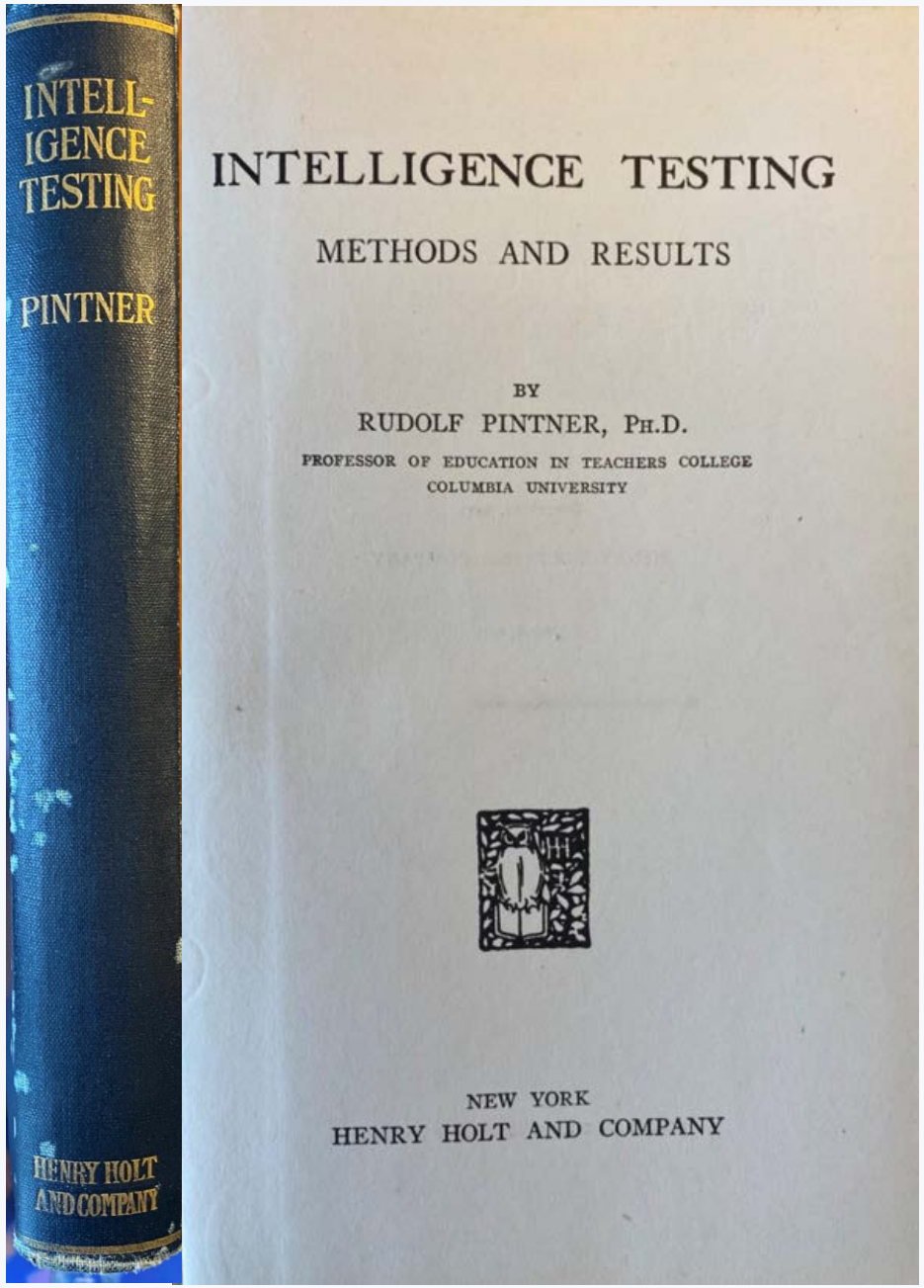
These tests Measure General Ability?



- Even though the tests have different content (shapes, words, numbers) they all rely on general ability (‘g’) as described by Wechsler and many others
- What IS GENERAL ABILITY?

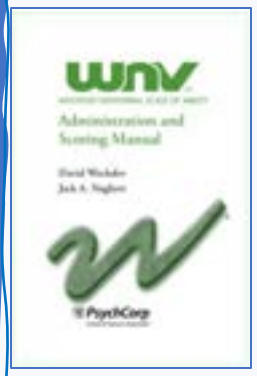
General Ability Definitions

- “we did not start with a clear definition of general intelligence… [but] borrowed from every-day life a vague term implying all-round ability and… we [are] still attempting to define it more sharply and endow it with a stricter scientific connotation” (p. 53, Pintner, 1923)”.



Wechsler's View of General ability

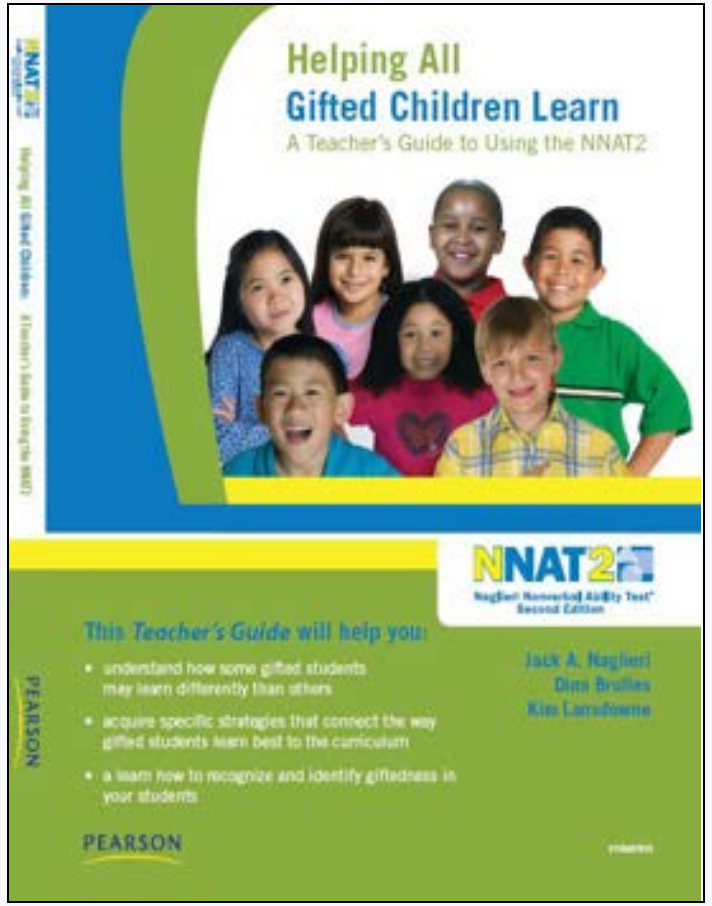
- Wechsler "believed that his Verbal and Performance Scales represented different ways to access *g* (general ability)", but he never believed [in verbal and] nonverbal intelligence as being separate from g. Rather he saw the Performance Scale as the most sensible way to measure the general intelligence of people with … limited proficiency in English. (Kaufman, 2008)



"The aggregate or global capacity of the individual to act purposefully, to think rationally, and to deal effectively with his environment (1939)"

General ability (Naglieri, Brulles & Lansdowne, 2009)

- General ability is what allows us to solve many different kinds of problems which may involve
  - reasoning, memory, sequencing, verbal and math skills, patterning, connecting ideas across content areas, insights, making connections, drawing inferences, analyzing simple and complex ideas.
- The key is to measure general ability in a way that is not confounded by knowledge



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

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Canivez, Gary L.,Watkins, Marley W.,Dombrowski, Stefan C.

Canivez, G. L., Watkins, M. W., & Dombrowski, S. C. (2017). Structural validity of the Wechsler Intelligence Scale for Children–Fifth Edition: Confirmatory factor analyses with the 16 primary and secondary subtests. *Psychological Assessment, 29*(4), 458–472.
https://doi.org/10.1037/pas0000358

The factor structure of the Wechsler Intelligence Scale for Children-Fifth Edition (WISC-V; Wechsler, 2014a) standardization sample (N = 2,200) was examined using confirmatory factor analyses (CFA) with maximum likelihood estimation for all reported models from the WISC-V *Technical and Interpretation Manual* (Wechsler, 2014b). Additionally, alternative bifactor models were examined and variance estimates and model-based reliability estimates (ω coefficients) were provided. Results from analyses of the 16 primary and secondary WISC-V subtests found that all higher-order CFA models with 5 group factors (VC, VS, FR, WM, and PS) produced model specification errors where the Fluid Reasoning factor produced negative variance and were thus judged inadequate. Of the 16 models tested, the bifactor model containing 4 group factors (VC, PR, WM, and PS) produced the best fit. Results from analyses of the 10 primary WISC-V subtests also found the bifactor model with 4 group factors (VC, PR, WM, and PS) produced the best fit. Variance estimates from both 16 and 10 subtest based bifactor models found dominance of general intelligence (g) in accounting for subtest variance (except for PS subtests) and large ω-hierarchical coefficients supporting general intelligence interpretation. The small portions of variance uniquely captured by the 4 group factors and low ω-hierarchical subscale coefficients likely render the group factors of questionable interpretive value independent of g (except perhaps for PS). Present CFA results confirm the EFA results reported by Canivez, Watkins, and Dombrowski (2015); Dombrowski, Canivez, Watkins, and Beaujean (2015); and Canivez, Dombrowski, and Watkins (2015).

Support for ‘g’

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

Which tests of general ability are used to identify gifted and talented students?

Ideas to Consider

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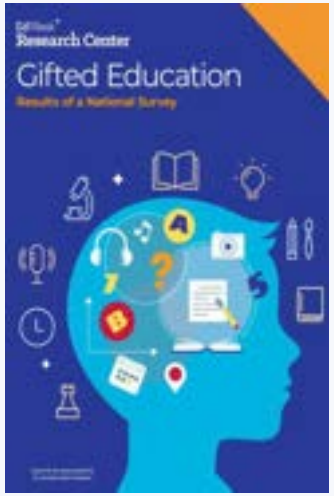
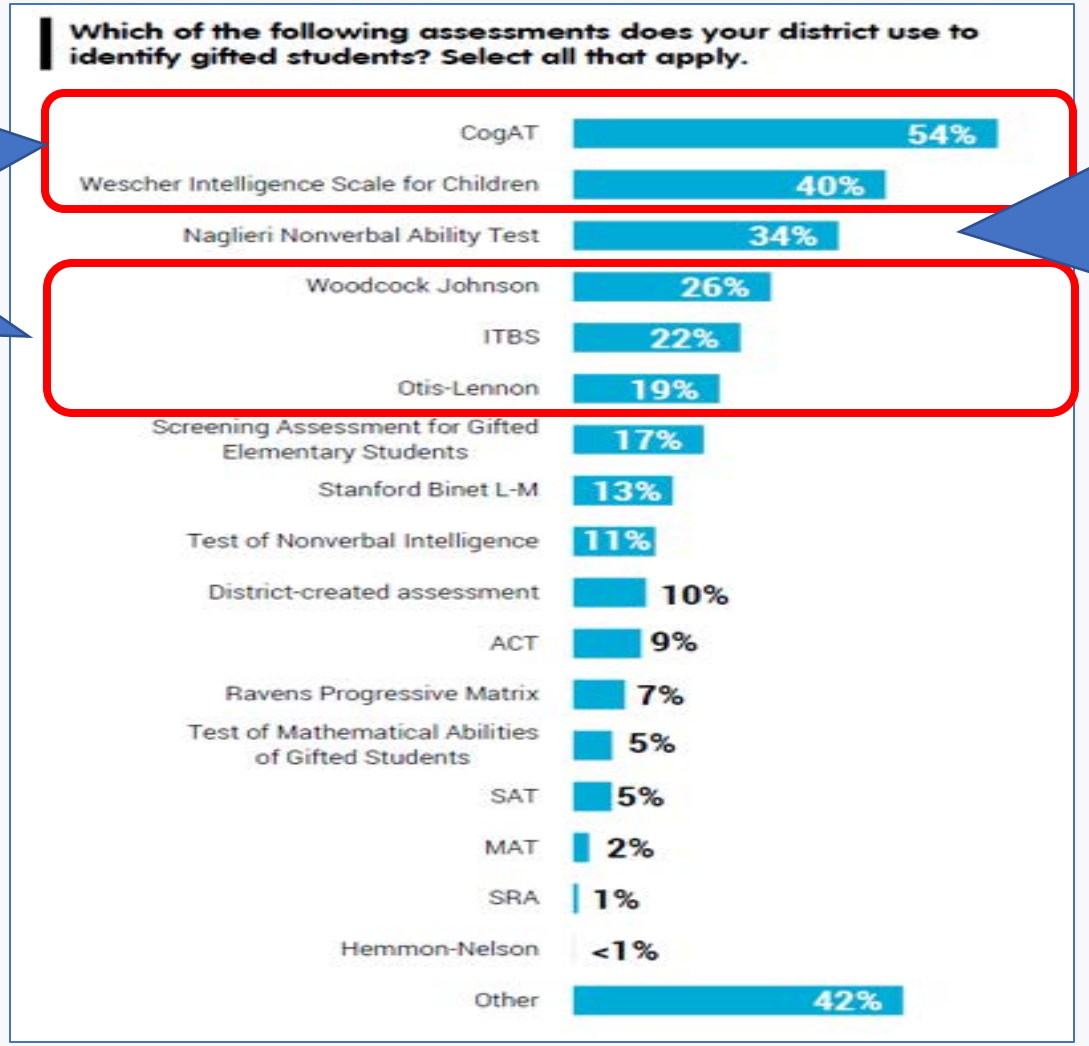
National Survey of Gifted Education

These tests have verbal and quantitative questions and lengthy verbal directions

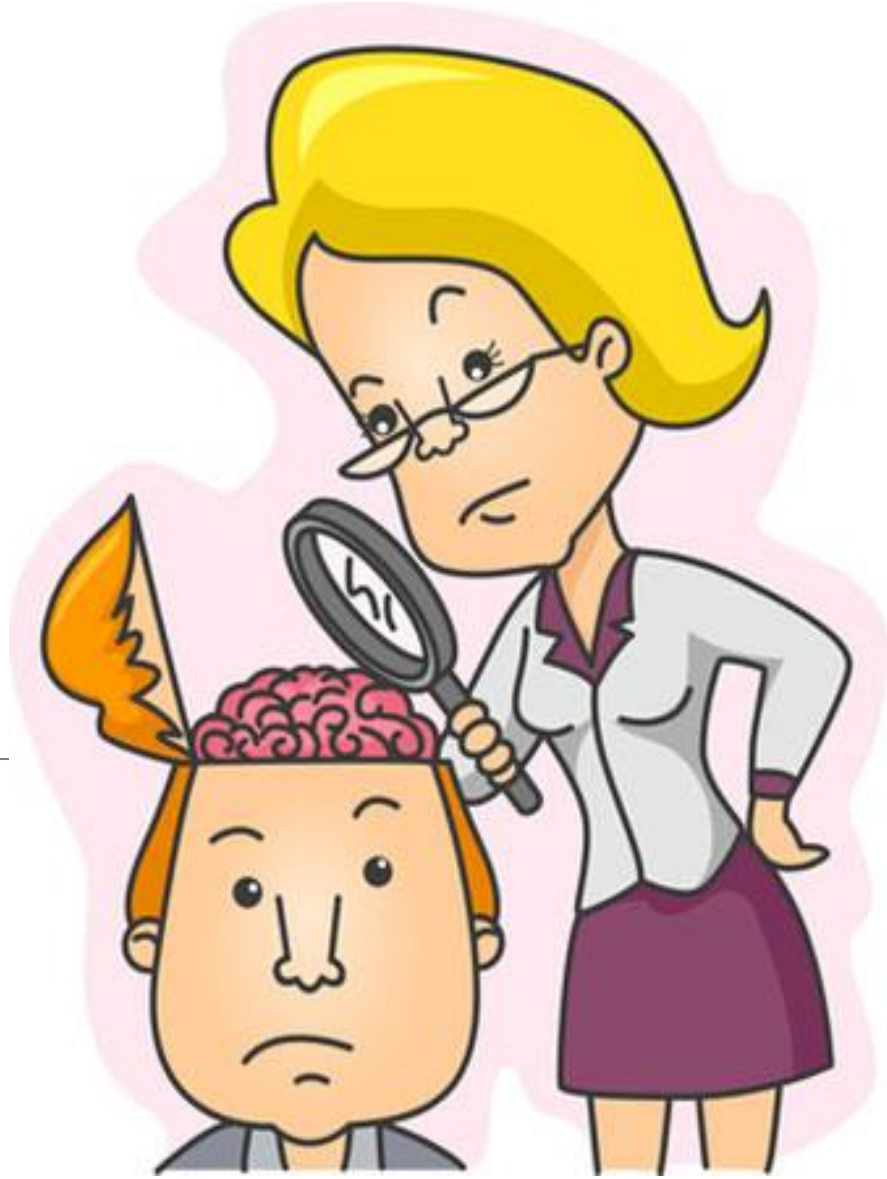




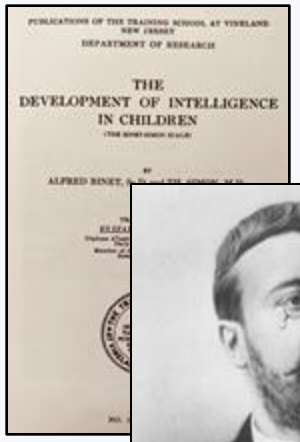
The NNAT is the only test that measures thinking in a way that is not confounded by knowing.

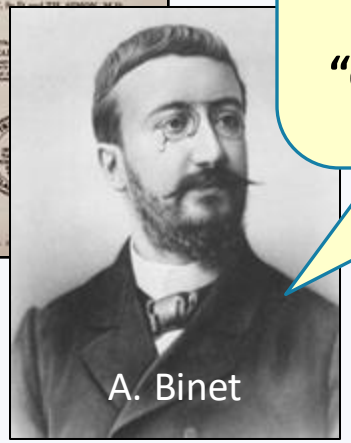
Why do measure intelligence the way we do?

The History of IQ tests



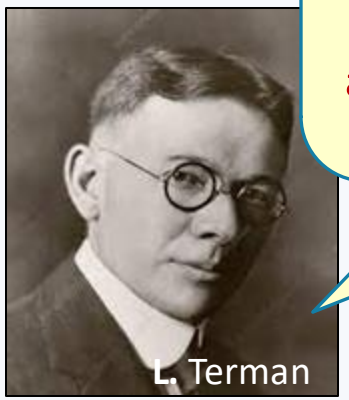
Binet - Stanford-Binet - Army Mental Tests - WISC, CogAT, Olsat




A. Binet

When Binet created his 1911 scale, he **excluded items from the previous 1908 scale that "depended too much on school learning"**

A. Otis

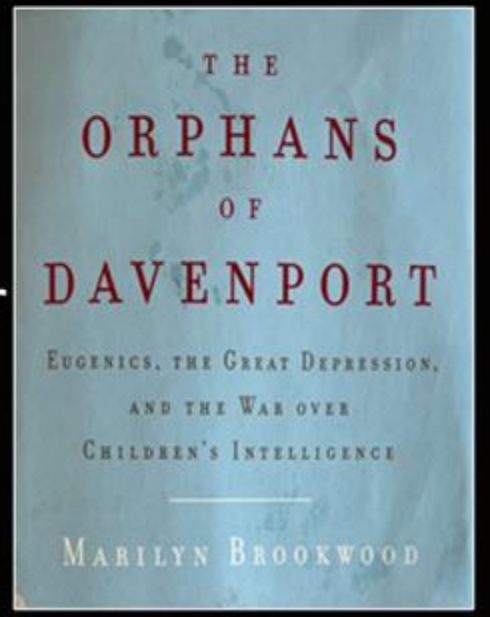

L. Terman

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'.

Lewis Terman 1916 Stanford-Binet

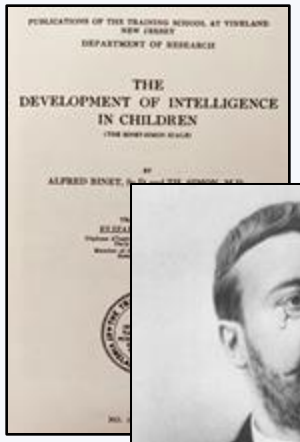
- He viewed VERBAL as the highest form of intelligence which distorted the evaluation of intelligence for countless numbers of people
- Terman predicted that the Stanford-Binet would reveal "significant racial differences in general intelligence…which cannot be wiped out by any scheme of mental culture" (Brookwood, 2021 p. 68)

- His aim was identification of low intelligence children and adults who would be involuntarily institutionalized and sterilized for the improvement of society



Brookwood, M. (2021). The Orphans of Davenport. New York: Norton & Company. See Chapter 4.

Binet - Stanford-Binet - Army Mental Tests - WISC, CogAT, Olsat



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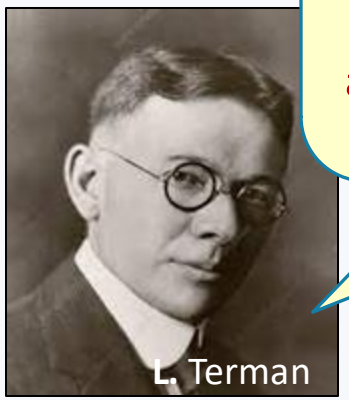
A. Otis



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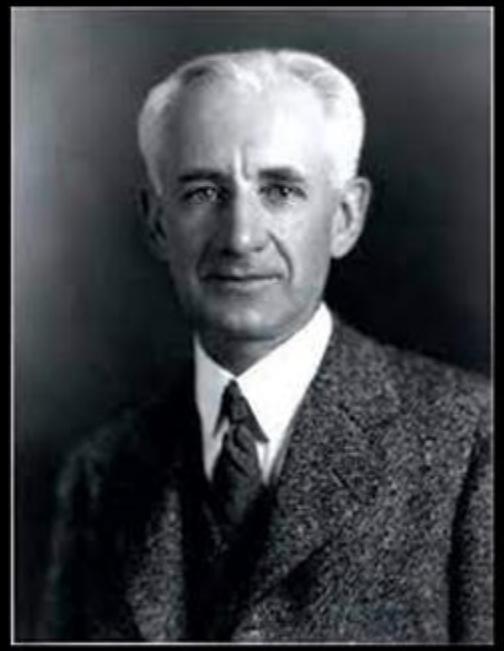
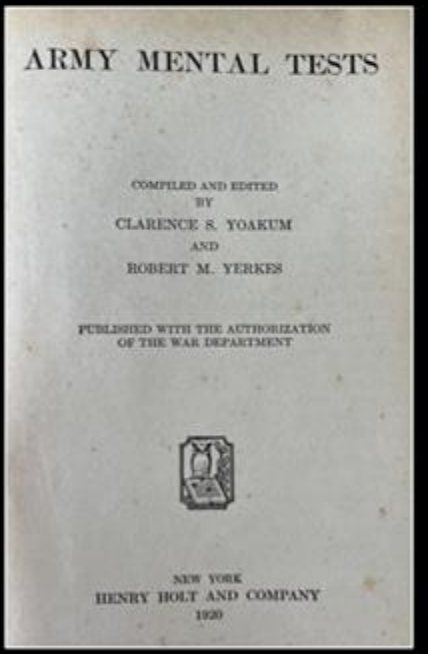
Arthur Otis (Terman's student) was instrumental in the development of the U.S. Army Alpha (Verbal & Quantitative) and Beta (Nonverbal) and the Otis-Lennon Ability Test

Robert Yerkes – Army Mental Tests 1920



- Robert Yerkes, of Harvard University was president of the *American Psychological Association*
- and leader of the *Eugenics Section of the American Breeders' Association's Committee on the Inheritance of Mental Traits*
- which advocated institutional segregation and sterilization for persons with low intelligence.
- Co-author of the Army Mental Tests


ARMY MENTAL TESTS

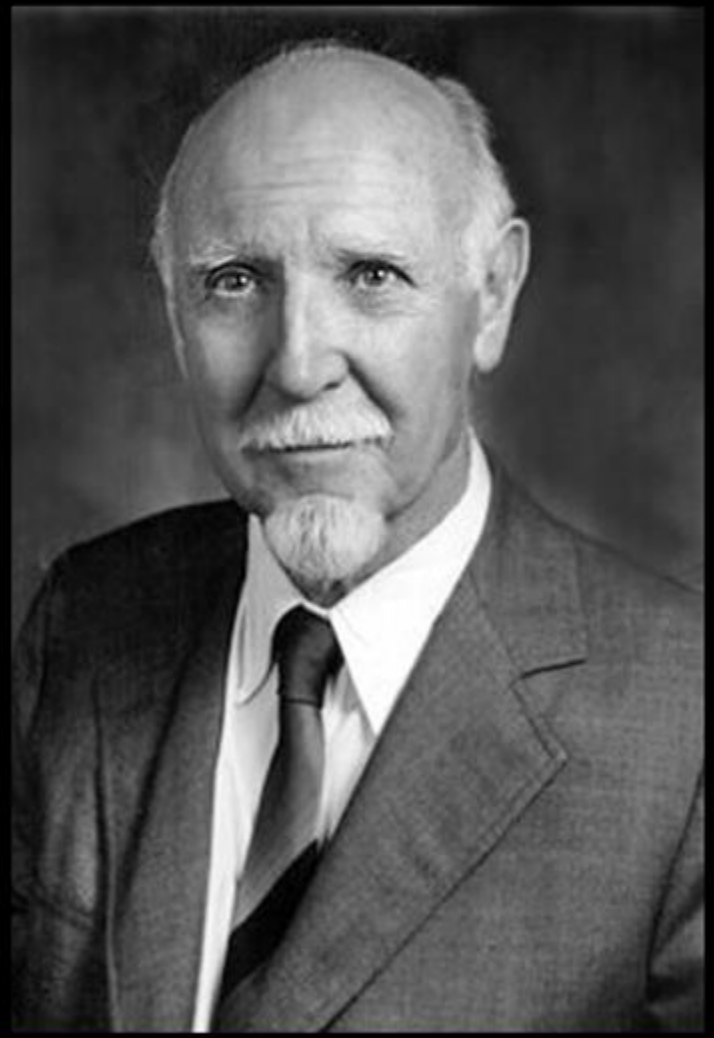
COMPILED AND EDITED
BY
CLARENCE S. YOAKUM
AND
ROBERT M. YERKES

PUBLISHED WITH THE AUTHORIZATION
OF THE WAR DEPARTMENT

NEW YORK
HENRY HOLT AND COMPANY
1920

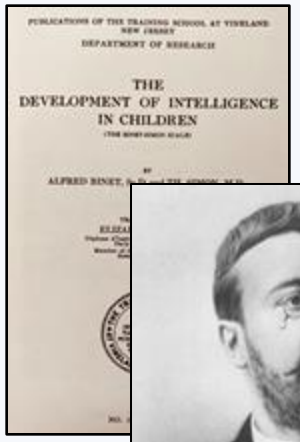
Brookwood, M. (2021). The Orphans of Davenport. New York: Norton & Company. See Chapter 4.

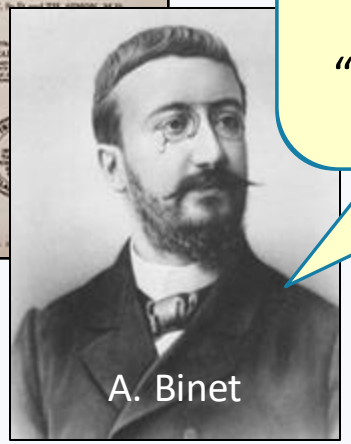
Raymond Cattell - 1933



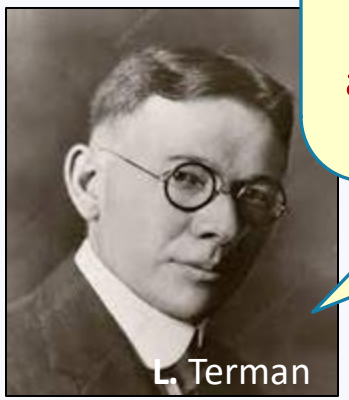
- spoke out against race mixing, and he lobbied to overturn the 1954 Brown v. Board Education

Binet → Stanford-Binet → Army Mental Tests → WISC, CogAT, Olsat




A. Binet

When Binet created his 1911 scale, he excluded items from the previous 1908 scale that "depended too much on school learning"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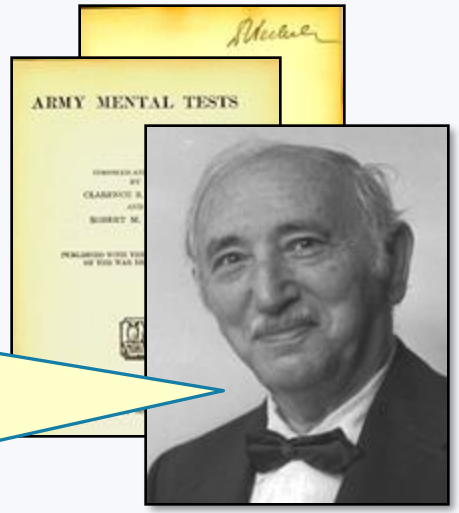
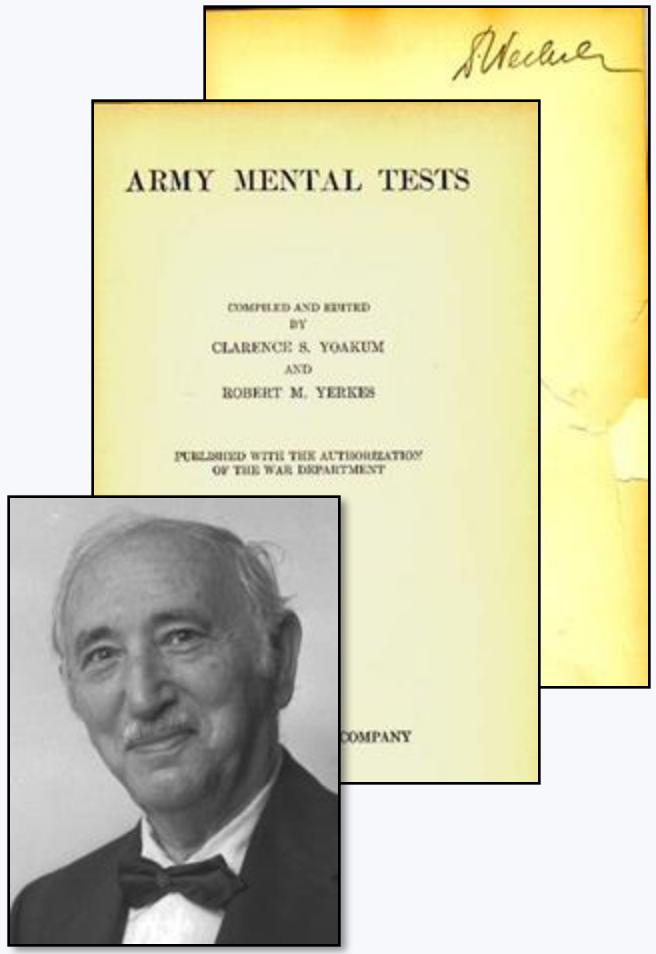


Wechsler based his intelligence test on the U.S. Army Mental Tests (Verbal, Quantitative & Nonverbal)

Army Alpha & Beta - Wechsler



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

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

Verbal & Quantitative IQ (Knowledge)

Nonverbal IQ (Thinking)

WISC, CogAT & Otis-Lennon

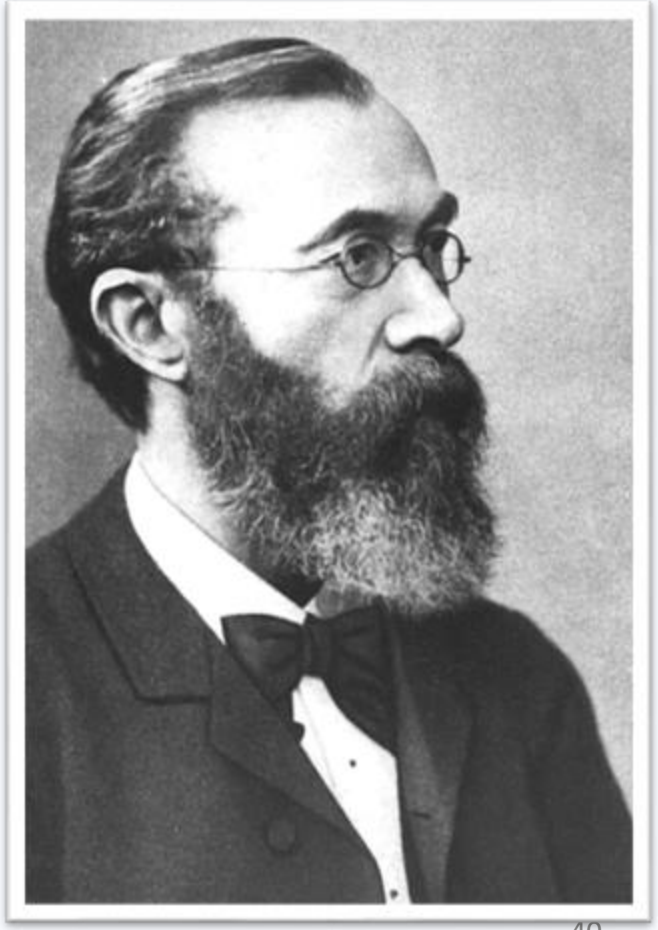
CONCEPT OF GENERAL INTELLIGENCE 61

The Criteria of a Test of Intelligence. — Influenced both by the theoretical discussion of general intelligence and by the empirical work of testing, we have arrived at certain requirements for a good test of intelligence, which we may discuss under the four following headings:

1. *Tests must be relatively new.* — A good intelligence test must avoid as much as possible anything that is commonly learned by the subjects tested. In a broad sense this rests upon a differentiation between knowledge and intelligence. To use as a test of intelligence something that is commonly taught in school is not desirable, because those children who have reached the particular grade in which this is generally taught have memorized this fact, whereas other children of equal or greater intelligence may have had no opportunity to learn this same fact, simply because they may not have reached this particular grade in their school work. To ask the question, "Who discovered America?" would be indicative of the school progress or general cultural environment of the child rather than of his general intelligence. Failure to answer might indeed be due to lack of intelligence in the case of school children of a certain grade in which this had been a matter of instruction, but on the other hand a very intelligent child might fail to answer owing to the fact of his not being in the grade in which this was taught.

Pintner
(Intelligence Testing, 1923)

- This is a social justice issue for those from disadvantaged communities and those with limited education

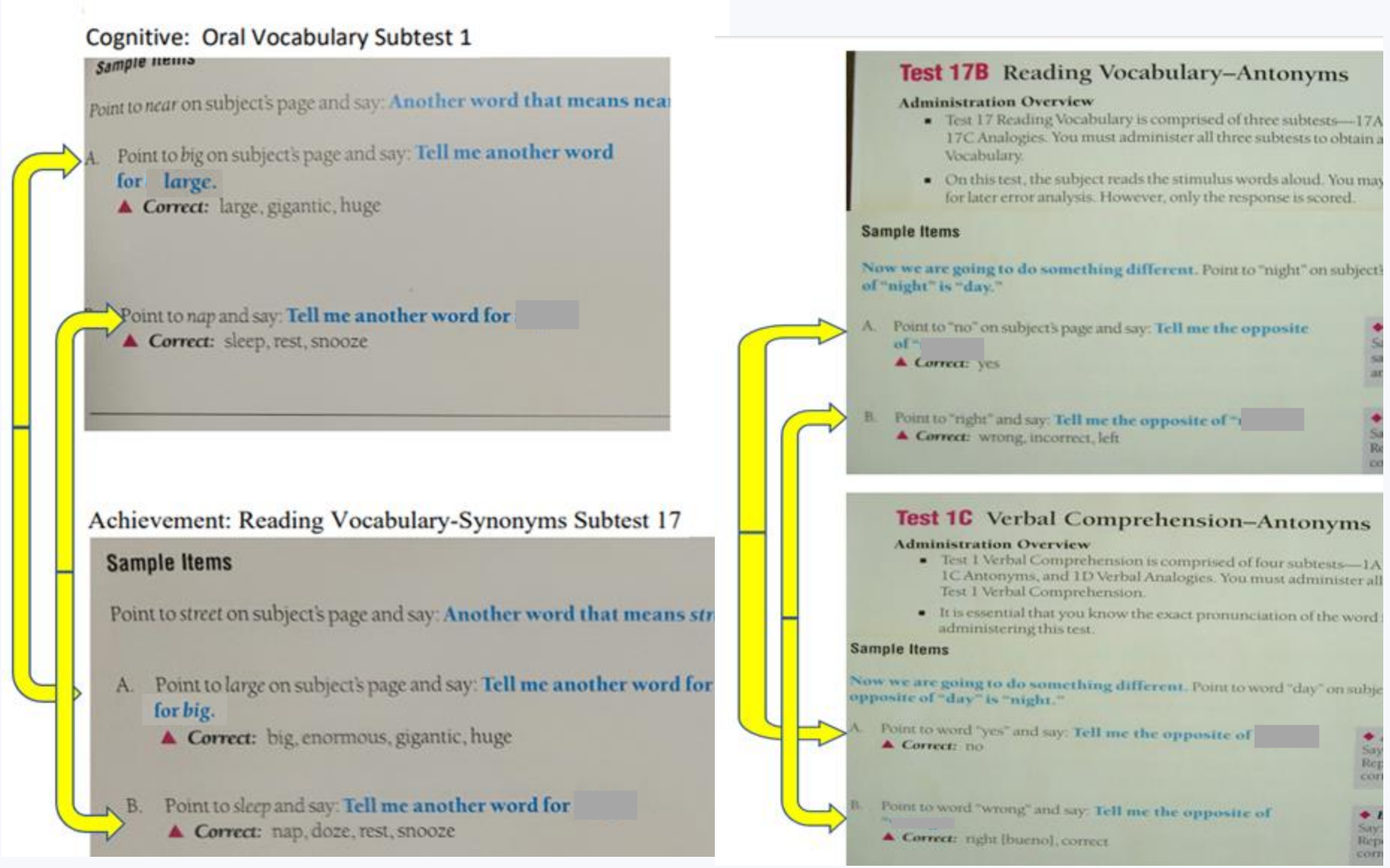


Knowledge is Included in "Ability" Tests

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

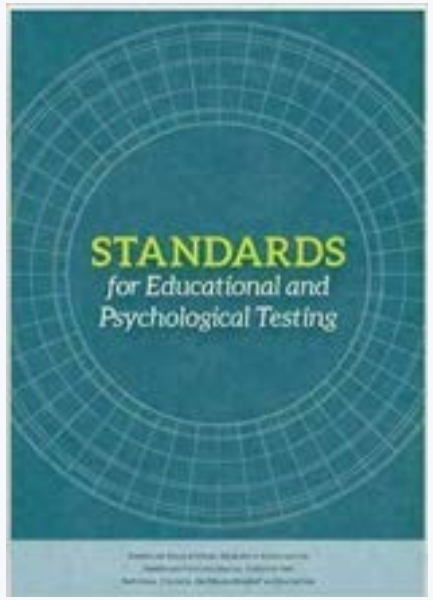
Very Similar Items on "Different" Tests

Woodcock-Johnson Cognitive & Achievement Tests (CHC)

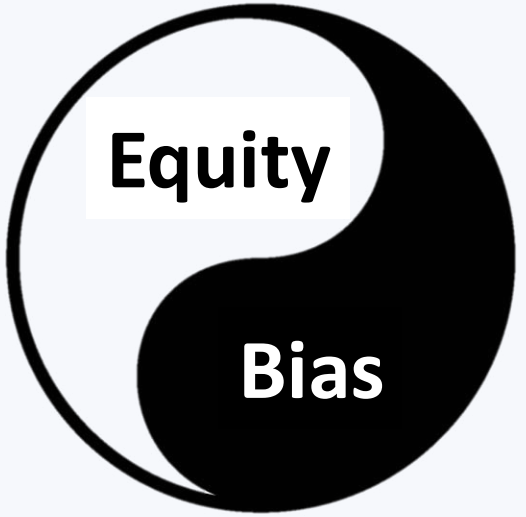


Differences in Mean Scores = Impact

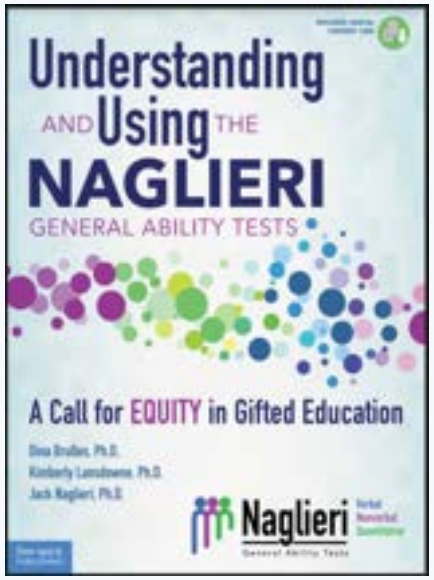
According to the *Standards for Educational and Psychological Testing* (AERA, APA, NCME, 2014)



- … **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.**



Race and Ethnic Differences by Ability Test



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

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

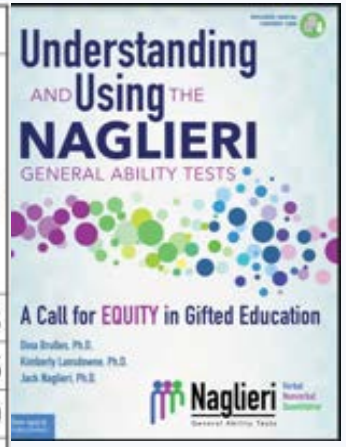
***Traditional* and *2nd-Generation* Ability Tests**

	By Race	By Ethnicity
Tests that require knowledge	**Mn = 9.5**	**Mn = 5.2**
Otis-Lennon School Ability Test (distric 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 scale)	11.8	7.6
CogAT7 - Verbal	6.6	5.3
CogAT7-Quantitative	5.6	3.6
CogAT- Nonverbal	6.4	2.9
CogAT-Total (V, Q & NV)	7.0	4.5
WISC-V (statistical controls normative sample)	8.7	
Tests that require minimal knowledge	**Mn = 4.3**	**Mn = 2.9**
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 controls normative sample)	4.8	4.8
CAS-2 (statistical controls normative sample)	4.3	1.8
CAS-2 Brief (normative samples)	2.0	2.8
NNAT (matched samples)	4.2	2.8
Naglieri General Ability Test-Verbal	2.2	1.6
Naglieri General Ability Test-Nonverbal	1.0	1.1
Naglieri General Ability Test-Quantitative	3.2	1.3

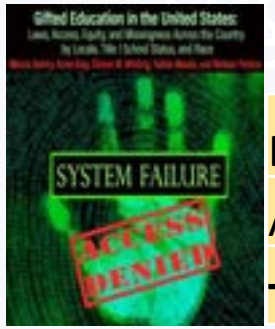
Note: The results summarized here were reported for the Otis-Lennon School Ability Test by Avant and O'Neal (1986); Stanford-Binet IV by Wasserman (2000); Woodcock-Johnson III race differences by Edwards and Oakland (2006) and ethnic differences by Sotelo-Dynega, Ortiz, Flanagan, and Chaplin (2013); 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); 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).

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

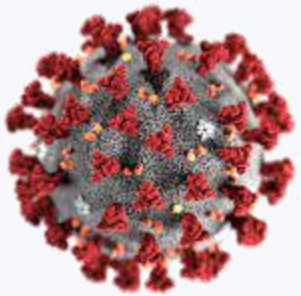


873,129 +

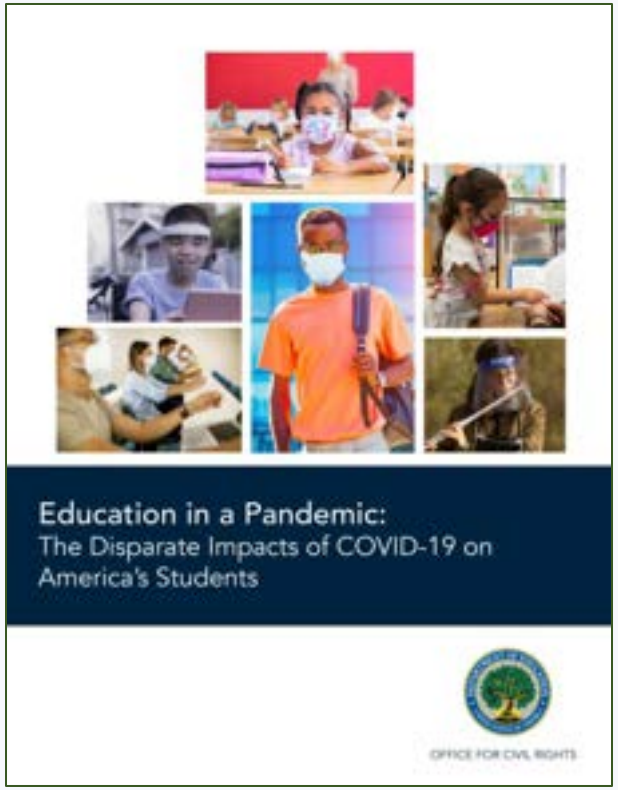


Percent of Schools that do not Identify	41.5%
Additional non-white gifted students = 41.5% of 873,129	N = 362,305
Total non-white gifted students missed	**N = 1,235,434**

Academic Learning Loss & COVID



- COVID-19 has deepened the impact of disparities in access and opportunity for students of color
- Students of color are even further behind than they were before the pandemic
- ELL students had the dual challenge of learning content and English.
- These students' **intellectual scores on traditional tests** will reflect that larger learning gap related to COVID



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

Illinois School District U-46

Main question: Does the District's gifted program unlawfully discriminate against Hispanic Students?

The district with 42% Hispanics but only 2% of students in gifted were Hispanic.

IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

DANIEL, DINAH and DEANNA MCFADDEN, minors, by their parent and next friend, Tracy McFadden; KAREN, RODOLFO and KIARA TAPIA, minors, by their parent and next friend, Mariela Montoya; JOCELYN BURCIAGA, minor, by her parent and next friend, Griselda Burciaga; and KASHMIR IVY, minors, by their parent and next friend, Beverly Ivy; KRISTIANNE SIFUENTES, minors, by her parent and next friend, Irma Sifuentes,

Plaintiffs,

v.

BOARD OF EDUCATION FOR ILLINOIS SCHOOL DISTRICT U-46,

Defendant.

No. 05 C 0760

Judge Robert W. Gettleman

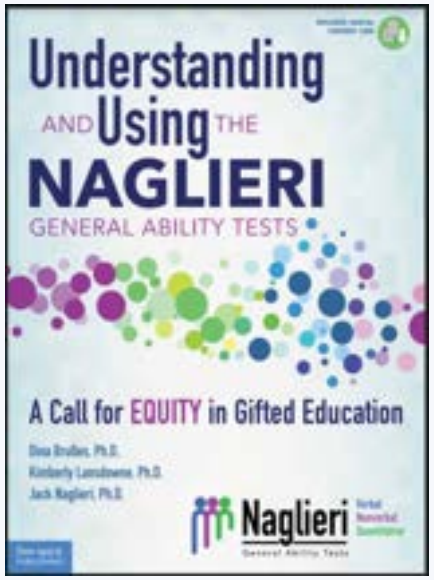
Weighted matrix favored achievement and CogAT

Too little reliance on NNAT

On July 11, 2013, Judge Robert Gettlemen issued a decision holding that District U-46 *intentionally* discriminated against Hispanic students specific in their gifted programming (placement), and found problems with policies and instruments for

screening and identification, (c) use of both verbal and math scores at arbitrary designated levels for screening and for identification, (d) use of weighted matrix, as well as content and criteria in weighted matrices that favored achievement and traditional measures, (e) too little reliance on a nonverbal test (Naglieri Nonverbal Ability Test) for admission to

Race and Ethnic Differences by Ability Test



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Initial Research Results (2019)

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.

- **VERBAL SAMPLE**
  - 2,482 That closely matches the US population on key demographics
- **GENDER**
  - No differences between **males** and **females** for raw score across all forms
- **RACE/ETHNICITY**
  - No differences among **White, Black, & Hispanic** for raw score across all forms
- **PARENTAL EDUCATION LEVEL**
  - No 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

- **NONVERBAL SAMPLE**
  - 3,630 That closely matches the US population on key demographics
- **GENDER**
  - No differences between **males** and **females** for raw score across all forms
- **RACE/ETHNICITY**
  - No differences among **White, Black, & Hispanic** for raw score across all forms
- **PARENTAL EDUCATION LEVEL**
  - No 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 SAMPLE**
  - 2,841 That closely matches the US population on key demographics
- **GENDER**
  - No differences between **males** and **females** for raw score across all forms
- **RACE/ETHNICITY**
  - No differences among **White, Black, & Hispanic** for raw score across all forms
- **PARENTAL EDUCATION LEVEL**
  - No 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

Summary of Reliability, Validity and Fairness

- The Naglieri–V items were subjected to a cultural review
- **Reliability coefficients** for the Verbal, Nonverbal and Quantitative tests were **high and exceed guidelines** for test reliability
- Confirmatory factor analysis of the three tests, independently and in combination supported a broad factor **of general ability**
- The Naglieri–NV correlated significantly **with the NNAT3**
- **Gifted students scored considerably higher** than students from the general population
- All test ITEMS were inspected for fairness by gender, race, ethnicity, parental education level (PEL), and primary language spoken using differential item functioning (DIF) and analyses of covariance; **negligible to small differences were found**
- Overall, initial findings suggest that the Naglieri General Ability Tests meet guidelines for reliability, validity, and fairness

Use of the Naglieri General Ability Tests

- Each test can be used individually or in any combination
- All raw scores are automatically converted into derived scores using local norms as determined by the district personnel and NATIONAL NORMS (Post Covid)
- Ordering information is available from Debbie Roby, GATE Account Executive, by email [debbie.roby@mhs.com] and phone [214.908.7769]
- To contact the authors:

  jnaglieri@gmail.com dbrulles@gmail.com kimberly.lansdowne@asu.edu

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

— Maya Angelou —

Solution: Measure Thinking not Knowledge

- What does the student have to know to complete a task?
  - This is dependent upon educational opportunity

- How does the student have to think to complete a task?
  - This is dependent on the brain

Gifted Identification

- This presentation is about children who may not have good grades, or the academic skills or command of English, which LOWERS their ability test scores so they do NOT look as smart as they are
- These children can become very **talented** given the opportunity to learn
- How many children like this

  are in our country?

Ideas to Consider

- My equity journey
- New tests of General Ability
- What is General Ability
- Identification of gifted students
- Local and National Norms
- Twice Exceptional gifted students with
  - SLD
  - ADHD
  - ASD
- PASS validity, profiles and interpretation

Using Local Norms-a strategy to increase underrepresented populations in gifted services

- **National norms-** Compare a student's performance to peers from the same age or grade across the country

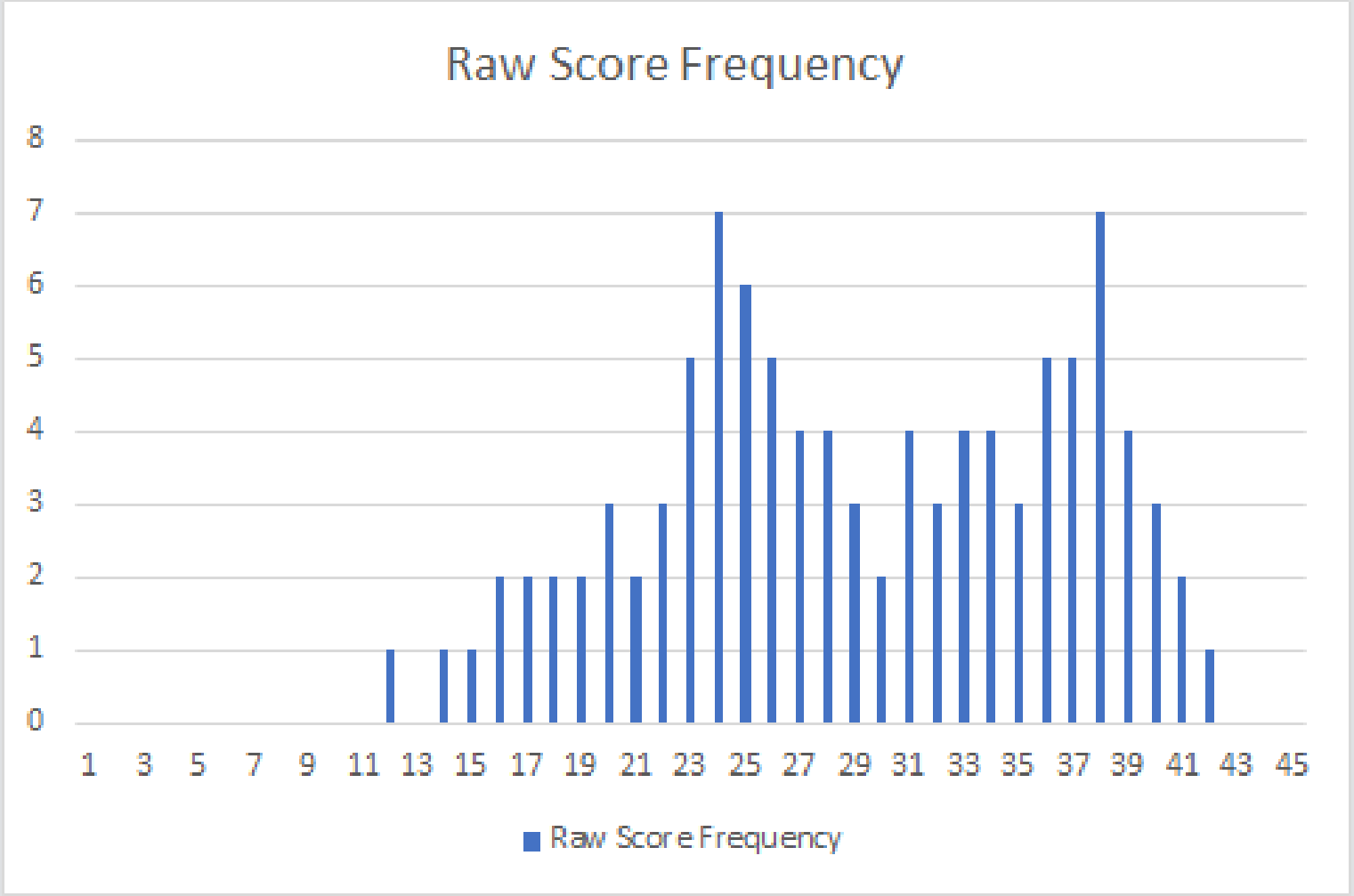
- **Local norms-** Compare a student's performance to grade level peers in the same district, school or specific grade
  - district level norms
  - school building level norms
  - group norms (ie. if 30% of the students are (demographic), compare scores across that group)

Naglieri General Ability Tests International Use

- Use a Local Norming Procedure
- Obtain scores for **ALL** students (not only referred students) in the grades for which the GT decisions is needed
- Decide how the information obtained for each student is to be evaluated (i.e., average, and or logic) and if it is to be weighted
- Evaluate the outcome vis-à-vis equity

Local Norming Example

Raw scores for all student across four grade 3 classrooms



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

Local Norming Example

Average Scores by total group and sub-groups

Red highlighted values indicate scores of 120 (91st Percentile Rank) and above. Local Rank, Local Percentile and Local Standard Scores are based on three ways to group the students

4 Grade 3 classes				
Student ID	Student Raw Score	Local Rank	Local Percentile	Standard Score
8	42	1	99	135
68	41	2	98	131
13	41	2	98	131
32	40	4	95	125
10	40	4	95	125
61	40	4	95	125
89	39	7	91	120
80	39	7	91	120
81	39	7	91	120
17	39	7	91	120
27	38	11	84	115
79	38	11	84	115
35	38	11	84	115
4	38	11	84	115
56	38	11	84	115
30	38	11	84	115
47	38	11	84	115
34	37	18	79	112
22	37	18	79	112
31	37	18	79	112
60	37	18	79	112
43	37	18	79	112
96	36	23	74	110
1	36	23	74	110
70	36	23	74	110
39	36	23	74	110
3	36	23	74	110
85	35	28	71	108
33	35	28	71	108
65	35	28	71	108
37	34	31	67	106
53	34	31	67	106
86	34	31	67	106
9			67	106
5			63	105
5			63	105
4			63	105
1			63	105
3			60	104
			60	104
			60	104
			56	102
72		42	56	102
99		42	56	102
92		42	56	102
Mn	29	48.9	48.3	99
SD	7.4	29.2	29.1	15.1
N	100	100	100	100

Grade 3 Classess 1 and 2				Local
Student ID	Student Raw Score	Local Rank	Local Percentile	Standard Score
32	40	1	99	135
89	39	2	98	131
43	37	3	96	126
39	36	4	94	123
91	34	5	92	121
87	32	6	90	119
51	30	7	88	118
78	29	8	84	115
94	29	8	84	115
41	28	10	78	112
7	28	10	78	112
38	28	10	78	112
23	27	13	72	109
73	27	13	72	109
2	27	13	72	109
52	26	16	64	105
18	26	16	64	105
74	26	16	64	105
82	26	16	64	105
50	25	20	56	102
45	25	20	56	102
20	25	20	56	102
62	25	20	56	102
6	24	24	46	98
24	24	24	46	98
84	24	24	46	98
75	24	24	46	98
98	24	24	46	98
63	23	29	38	95
88	23	29	38	95
95	23	29	38	95
44	23	29	38	95
57	22	33	32	93
1		3	32	93
4		3	32	93
5		6	28	91
5		6	28	91
9		8	22	88
7		8	22	88
			22	88
			18	86
			18	86
12		43	14	84
90		43	14	84
21		45	10	81
Mn	24.2	25.1	48.2	99.2
SD	6.2	14.9	29.6	15.5
N	51	51	51	51

Grade 3 Classess 3 and 4				Local
Student ID	Student Raw Score	Local Rank	Local Percentile	Standard Score
8	42	1	99	135
68	41	2	96	126
13	41	2	96	126
10	40	4	92	121
61	40	4	92	121
80	39	6	85	116
81	39	6	85	116
17	39	6	85	116
27	38	9	71	108
79	38	9	71	108
35	38	9	71	108
4	38	9	71	108
56	38	9	71	108
30	38	9	71	108
47	38	9	71	108
34	37	16	63	105
22	37	16	63	105
31	37	16	63	105
60	37	16	63	105
96	36	20	54	102
1	36	20	54	102
70	36	20	54	102
3	36	20	54	102
85	35	24	48	99
33	35	24	48	99
65	35	24	48	99
37	34	27	42	97
53	34	27	42	97
86	34	27	42	97
55	33	30	33	94
58	33	30	33	94
49	33	30	33	94
11	33	30	33	94
36		34	29	92
77		34	29	92
15		36	21	88
72		36	21	88
99		36	21	88
92		36	21	88
			19	87
			17	85
			15	84
10		3	13	83
16		44	10	81
29		45	6	77
Mn	34	23.8	47.5	98.6
SD	5	14.7	28.9	15.2
N	49	49	49	49

Values associated with raw scores less than 30 are omitted

29.0
N=100

24.2
n=51

34.0
n=49

Local Norming Example

- The same raw score (number correct) yields different percentile ranks and standard scores because these derived scores are calculated on the basis of the mean and SD of the three separate groups.
- Each student is compared to a group that more precisely represents them.

4 Grade 3 classes

Student ID	Student Raw Score	Local Rank	Local Percentile	Standard Score
8	42	1	99	135
68	41	2	98	131
13	41	2	98	131
32	40	4	95	125
10	40	4	95	125
61	40	4	95	125
89	39	7	91	120
80	39	7	91	120
81	39	7	91	120
17	39	7	91	120
27	38	11	84	115
79	38	11	84	115
35	38	11	84	115
4	38	11	84	115
56	38	11	84	115
30	38	11	84	115
65	35	28	71	108
37	34	31	67	106
53	34	31	67	106
86	34	31	67	106
91	34	31	67	106
55	33	35	63	105
58	33	35	63	105
49	33	35	63	105
11	33	35	63	105
36	32	39	60	104
77	32	39	60	104
87	32	39	60	104
15	31	42	56	102
72	31	42	56	102
99	31	42	56	102
92	31	42	56	102
Mn	29	48.9	48.3	99
SD	7.4	29.2	29.1	15.1
N	100	100	100	100

Student Raw Score of 40 = 95th percentile and standard score of 125

Grade 3 Classess 1 and 2

Student ID	Student Raw Score	Local Rank	Local Percentile	Standard Score
32	40	1	99	135
89	39	2	98	131
43	39	3	96	126
39	39	4	94	123
91	39	5	92	121
87	39	6	90	119
51	38	7	88	118
78	38	8	84	115
94	38	8	84	115
41	38	10	78	112
24	24	24	46	98
84	24	24	46	98
75	24	24	46	98
98	24	24	46	98
63	23	29	38	95
88	23	29	38	95
95	23	29	38	95
44	23	29	38	95
57	22	33	32	93
19	22	33	32	93
42	22	33	32	93
5	21	36	28	91
54	21	36	28	91
9	20	38	22	88
71	20	38	22	88
26	20	38	22	88
76	19	41	18	86
48	19	41	18	86
12	18	43	14	84
90	18	43	14	84
21	17	45	10	81
Mn	24.2	25.1	48.2	99.2
SD	6.2	14.9	29.6	15.5
N	51	51	51	51

Student Raw Score of 40 = 99th percentile and standard score of 135

Grade 3 Classess 3 and 4

Student ID	Student Raw Score	Local Rank	Local Percentile	Standard Score
8	42	1	99	135
68	41	2	96	126
13	41	2	96	126
10	40	4	92	121
61	40	4	92	121
80	39	6	85	116
81	39	6	85	116
17	39	6	85	116
27	38	9	71	108
79	38	9	71	108
35	38	9	71	108
4	38	9	71	108
56	38	9	71	108
30	38	9	71	108
47	38	9	71	108
86	34	27	42	97
55	33	30	33	94
58	33	30	33	94
49	33	30	33	94
11	33	30	33	94
36	32	34	29	92
77	32	34	29	92
15	31	36	21	88
72	31	36	21	88
99	31	36	21	88
92	31	36	21	88
25	30	40	19	87
66	29	41	17	85
40	28	42	15	84
100	27	43	13	83
16	26	44	10	81
29	25	45	6	77
Mn	34	23.8	47.5	98.6
SD	5	14.7	28.9	15.2
N	49	49	49	49

Student Raw Score of 40 = 92nd percentile and standard score of 121

Values associated with raw scores less than 30 are omitted

Local Norming Example

The top seven students in all four classes (those with ID# 8, 68, 13, 32, 10, 61, 89) are still identified

4 Grade 3 classes				
Student ID	Student Raw Score	Local Rank	Local Percentile	Standard Score
8	42	1	99	135
68	41	2	98	131
13	41	2	98	131
32	40	4	95	125
10	40	4	95	125
61	40	4	95	125
89	39	7	91	120
80	39	7	91	120
81	39	7	91	120
17	39	7	91	120
27	38	11	84	115
79	38	11	84	115
35	38	11	84	115
4	38	11	84	115
56	38	11	84	115
30	38	11	84	115
47	38	11	84	115
34	37	18	79	112
22	37	18	79	112
31	37	18	79	112
60	37	18	79	112
43	37	18	79	112
96	36	23	74	110
1	36	23	74	110
70	36	23	74	110
39	36	23	74	110
3	36	23	74	110
85	35	28	71	108
33	35	28	71	108
65	35	28	71	108
37	34	31	67	106
53	34	31	67	106
86	34	31	67	106
91	34	31	67	106
55	33	35	63	105
58	33	35	63	105
49	33	35	63	105
11	33	35	63	105
36	32	39	60	104
77	32	39	60	104
87	[illegible]	39	60	104
15	[illegible]	42	56	102
72	[illegible]	42	56	102
[illegible]	[illegible]	[illegible]	56	102
92	[illegible]	42	56	102
Mn	29	48.9	48.3	99
SD	7.4	29.2	29.1	15.1
N	100	100	100	100

29.0
N=100

Grade 3 Classess 1 and 2				
Student ID	Student Raw Score	Local Rank	Local Percentile	Standard Score
32	40	1	99	135
89	39	2	98	131
[illegible]	37	3	96	126
39	36	4	94	123
91	34	5	92	121
87	32	6	90	119
51	30	7	88	118
78	29	8	84	115
94	29	8	84	115
41	28	10	78	112
7	28	10	78	112
38	28	10	78	112
23	27	13	72	109
73	27	13	72	109
2	27	13	72	109
52	26	16	64	105
18	26	16	64	105
74	26	16	64	105
82	26	16	64	105
50	25	20	56	102
45	25	20	56	102
20	25	20	56	102
62	25	20	56	102
6	24	24	46	98
24	24	24	46	98
84	24	24	46	98
75	24	24	46	98
98	24	24	46	98
63	23	29	38	95
88	23	29	38	95
95	23	29	38	95
44	23	29	38	95
57	22	33	32	93
19	22	33	32	93
42	22	33	32	93
5	21	36	28	91
54	21	36	28	91
9	20	38	22	88
71	20	38	22	88
26	[illegible]	38	22	88
76	[illegible]	41	18	86
48	[illegible]	41	18	86
[illegible]	[illegible]	43	14	84
[illegible]	[illegible]	[illegible]	14	84
21	[illegible]	45	10	81
Mn	24.2	25.1	48.2	99.2
SD	6.2	14.9	29.6	15.5
N	51	51	51	51

24.2
n=51

Grade 3 Classess 3 and 4				
Student ID	Student Raw Score	Local Rank	Local Percentile	Standard Score
8	42	1	99	135
68	41	2	96	126
13	41	2	96	126
10	40	4	92	121
61	40	4	92	121
[illegible]	39	6	85	116
81	39	6	85	116
17	39	6	85	116
27	38	9	71	108
79	38	9	71	108
35	38	9	71	108
4	38	9	71	108
56	38	9	71	108
30	38	9	71	108
47	38	9	71	108
34	37	16	63	105
22	37	16	63	105
31	37	16	63	105
60	37	16	63	105
96	36	20	54	102
1	36	20	54	102
70	36	20	54	102
3	36	20	54	102
85	35	24	48	99
33	35	24	48	99
65	35	24	48	99
37	34	27	42	97
53	34	27	42	97
86	34	27	42	97
55	33	30	33	94
58	33	30	33	94
49	33	30	33	94
11	33	30	33	94
36	32	34	29	92
77	32	34	29	92
15	31	36	21	88
72	31	36	21	88
99	31	36	21	88
92	31	36	21	88
25	30	40	19	87
66	[illegible]	41	17	85
40	[illegible]	42	15	84
100	[illegible]	43	13	83
[illegible]	[illegible]	[illegible]	10	81
29	[illegible]	45	6	77
Mn	34	23.8	47.5	98.6
SD	5	14.7	28.9	15.2
N	49	49	49	49

34.0
n=49

Values associated with raw scores less than 30 are omitted

Local Norming Example

Students with ID# 43, 39 and 91 are now identified because they are compared to a group that more precisely reflects their background

4 Grade 3 classes				
Student ID	Student Raw Score	Local Rank	Local Percentile	Standard Score
8	42	1	99	135
68	41	2	98	131
13	41	2	98	131
32	40	4	95	125
10	40	4	95	125
61	40	4	95	125
89	39	7	91	120
80	39	7	91	120
81	39	7	91	120
17	39	7	91	120
27	38	11	84	115
79	38	11	84	115
35	38	11	84	115
4	38	11	84	115
56	38	11	84	115
30	38	11	84	115
47	38	11	84	115
34	37	18	79	112
22	37	18	79	112
31	37	18	79	112
60	37	18	79	112
43	37	18	79	112
96	36	23	74	110
1	36	23	74	110
70	36	23	74	110
39	36	23	74	110
3	36	23	74	110
85	35	28	71	108
33	35	28	71	108
65	35	28	71	108
37	34	31	67	106
53	34	31	67	106
86	34	31	67	106
91	34	31	67	106
55	33	35	63	105
58	33	35	63	105
49	33	35	63	105
11	33	35	63	105
36	32	39	60	104
77	32	39	60	104
87	32	39	60	104
15	31	42	56	102
72	31	42	56	102
99	31	42	56	102
92	31	42	56	102
Mn	29	48.9	48.3	99
SD	7.4	29.2	29.1	15.1
N	100	100	100	100

29.0
N=100

Grade 3 Classess 1 and 2				
Student ID	Student Raw Score	Local Rank	Local Percentile	Standard Score
32	40	1	99	135
89	39	3	96	126
43	37	3	96	126
39	36	4	94	123
91	34	5	92	121
87	32	6	90	119
51	30	7	88	118
78	29	8	84	115
94	29	8	84	115
41	28	10	78	112
7	28	10	78	112
38	28	10	78	112
23	27	13	72	109
73	27	13	72	109
2	27	13	72	109
52	26	16	64	105
18	26	16	64	105
74	26	16	64	105
82	26	16	64	105
50	25	20	56	102
45	25	20	56	102
20	25	20	56	102
62	25	20	56	102
6	24	24	46	98
24	24	24	46	98
84	24	24	46	98
75	24	24	46	98
98	24	24	46	98
63	23	29	38	95
88	23	29	38	95
95	23	29	38	95
44	23	29	38	95
57	22	33	32	93
19	22	33	32	93
42	22	33	32	93
5	21	36	28	91
54	21	36	28	91
9	20	38	22	88
71	20	38	22	88
26	20	38	22	88
76	19	41	18	86
48	19	41	18	86
12	19	43	14	84
14	19	43	14	84
21	18	45	10	81
Mn	24.2	25.1	48.2	99.2
SD	6.2	14.9	29.6	15.5
N	51	51	51	51

24.2
n=51

Grade 3 Classess 3 and 4				
Student ID	Student Raw Score	Local Rank	Local Percentile	Standard Score
8	42	1	99	135
68	41	2	96	126
13	41	2	96	126
10	40	4	92	121
61	40	4	92	121
80	39	6	85	116
81	39	6	85	116
17	39	6	85	116
27	38	9	71	108
79	38	9	71	108
35	38	9	71	108
4	38	9	71	108
56	38	9	71	108
30	38	9	71	108
47	38	9	71	108
34	37	16	63	105
22	37	16	63	105
31	37	16	63	105
60	37	16	63	105
96	36	20	54	102
1	36	20	54	102
70	36	20	54	102
3	36	20	54	102
85	35	24	48	99
33	35	24	48	99
65	35	24	48	99
37	34	27	42	97
53	34	27	42	97
86	34	27	42	97
55	33	30	33	94
58	33	30	33	94
49	33	30	33	94
11	33	30	33	94
36	32	34	29	92
77	32	34	29	92
15	31	36	21	88
72	31	36	21	88
99	31	36	21	88
92	31	36	21	88
25	30	40	19	87
66	30	41	17	85
40	30	42	15	84
100	30	43	13	83
10	81			
29	30	45	6	77
Mn	34	23.8	47.5	98.6
SD	5	14.7	28.9	15.2
N	49	49	49	49

34.0
n=49

Values associated with raw scores less than 30 are omitted


WE CAN DO
BETTER

Publisher Information: **MHS.COM**

The Naglieri General Ability Tests: Verbal, Nonverbal & Quantitative are published by MHS who also publish many measures used in the schools including the *Conners Rating Scales, Autism Spectrum Rating Scale* (ASRS; Goldstein & Naglieri) and the *Comprehensive Executive Function Inventory* (CEFI; Naglieri & Goldstein).

Change Demands Courage to Think Differently

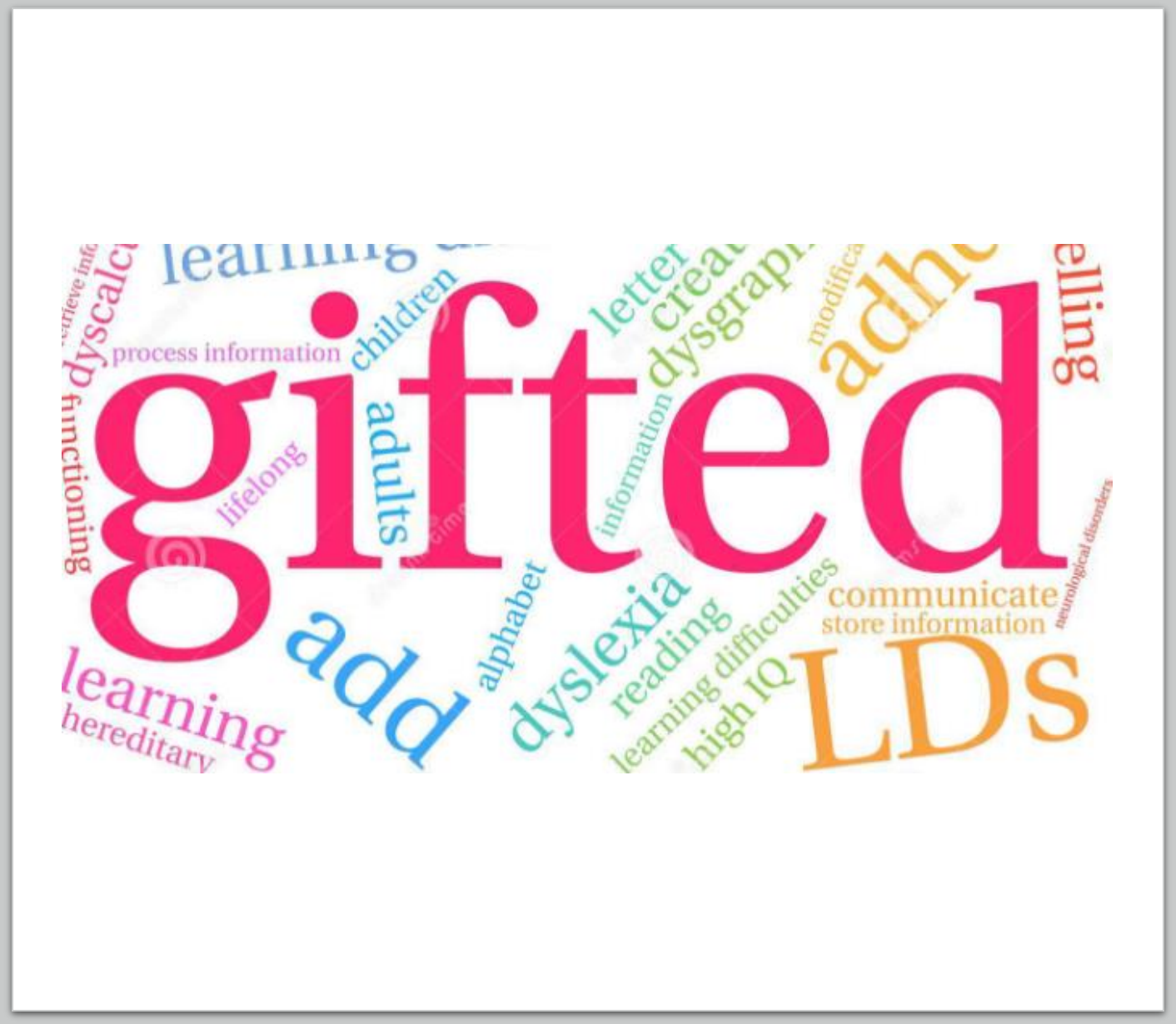
Ideas to Consider

- My equity journey
- New tests of General Ability
- What is General Ability
- Identification of gifted students
- Local and National Norms
- Twice Exceptional gifted students with
  - SLD
  - ADHD
  - ASD
- PASS validity, profiles and interpretation

Welcome

Twice exceptional gifted students..

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



Gifted with a Disability

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

Specific Learning Disability Assessment

Why measure ‘basic psychological processes’

Gifted Students with Disabilities

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

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

"(30) SPECIFIC LEARNING DISABILITY.—

"(A) IN GENERAL.—The term 'specific learning disability' means a disorder in 1 or more of the basic psychological processes involved in understanding or in using language, spoken or written, which disorder may manifest itself in the imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations.

"(B) DISORDERS INCLUDED.—Such term includes such conditions as perceptual disabilities, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia.

"(C) DISORDERS NOT INCLUDED.—Such term does not include a learning problem that is primarily the result of visual, hearing, or motor disabilities, of mental retardation, of emotional disturbance, or of environmental, cultural, or economic disadvantage.

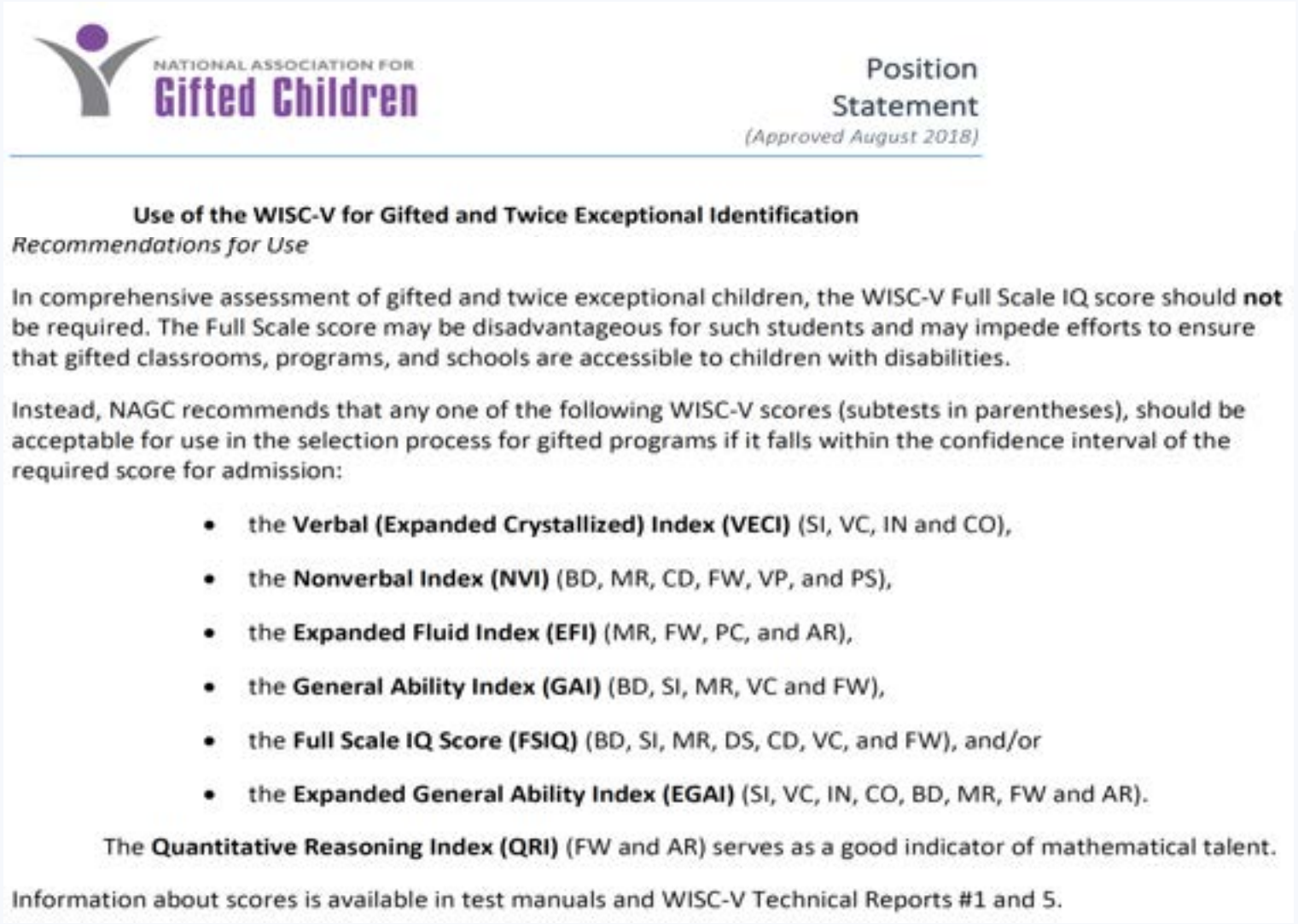
NIH-funded study finds dyslexia is not tied to IQ (2011)

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

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

Efforts to Identify Gifted Students (2018)

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



NATIONAL ASSOCIATION FOR Gifted Children

Position Statement

(Approved August 2018)

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

Recommendations for Use

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

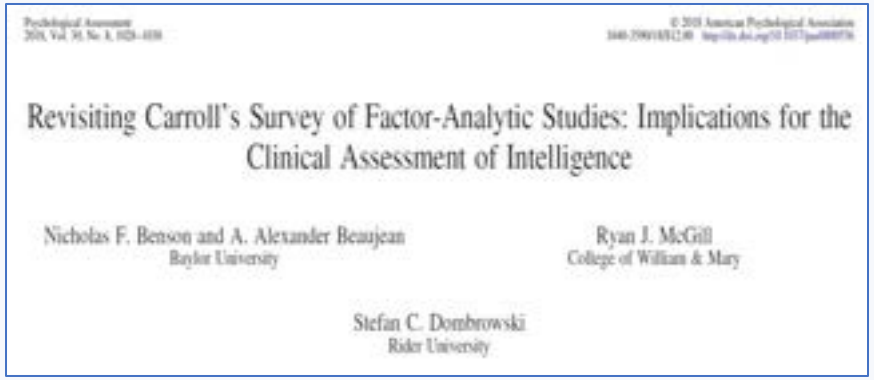
Instead, NAGC recommends that any one of the following WISC-V scores (subtests in parentheses), should be acceptable for use in the selection process for gifted programs if it falls within the confidence interval of the required score for admission:

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

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

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

Support for Scales, Subtests or ‘g’?


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

Nicholas F. Benson and A. Alexander Beaujean
Baylor University

Ryan J. McGill
College of William & Mary

Stefan C. Dombrowski
Rider University

- …The 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.**

Research Supports ‘g’ but little More

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

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

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

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

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

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

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

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

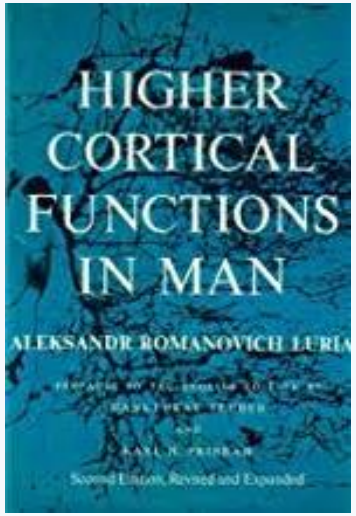
McGill, R. J., & **Canivez, G. L.** (2017, October). Confirmatory factor analyses of the **WISC–IV Spanish** core and supplemental Subtests: Validation evidence of the Wechsler and CHC models. *International Journal of School and Educational Psychology*. Advance online publication.

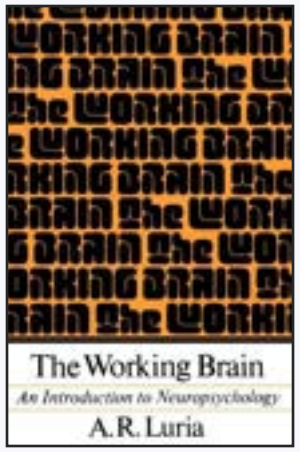
Watkins, M. W., Dombrowski, S. C., & **Canivez, G. L.** (2017, October). Reliability and factorial validity of the **Canadian Wechsler Intelligence Scale for Children–Fifth Edition**. *International Journal of School and Educational Psychology*.

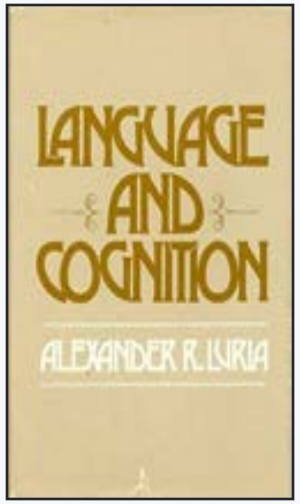
Alternatives to Traditional Intelligence Tests ?

Wechsler, Binet, CHC, OLSAT, CogAT

Luria's Explanation of Brain Function





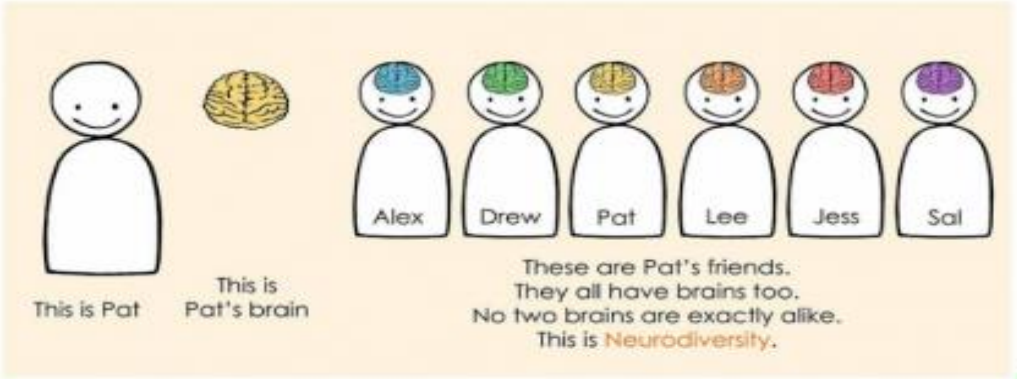


- **P**lanning = DECIDING HOW TO DO WHAT YOU DECIDE TO DO
- **A**ttention = BEING ALERT AND RESISTING DISTRACTIONS
- **S**imultaneous = GETTING THE BIG PICTURE
- **S**uccessive = FOLLOWING A SEQUENCE

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

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

Neurodiversity Defined



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

WebMD

What Is Neurodiversity?

By Keri Wiginton

Medically Reviewed by Smitha Bhandari, MD on April 07, 2021

There's a growing push to focus on our brain differences, not deficits. This wider view of "normal" is a big part of something called neurodiversity. Advocates hope the idea expands how we think of developmental disorders, including attention deficit hyperactivity disorder (ADHD).

'Neurodiversity' is a concept that implies that neurological difference is best understood as an inherent and valuable part of the range of human variation, rather than a pathological form of difference.

Dyck E., Russell G. (2020) Challenging Psychiatric Classification: Healthy Autistic Diversity and the Neurodiversity Movement. In: Taylor S., Brumby A. (eds) Healthy Minds in the Twentieth Century. Mental Health in Historical Perspective. Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-030-27275-3_8

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

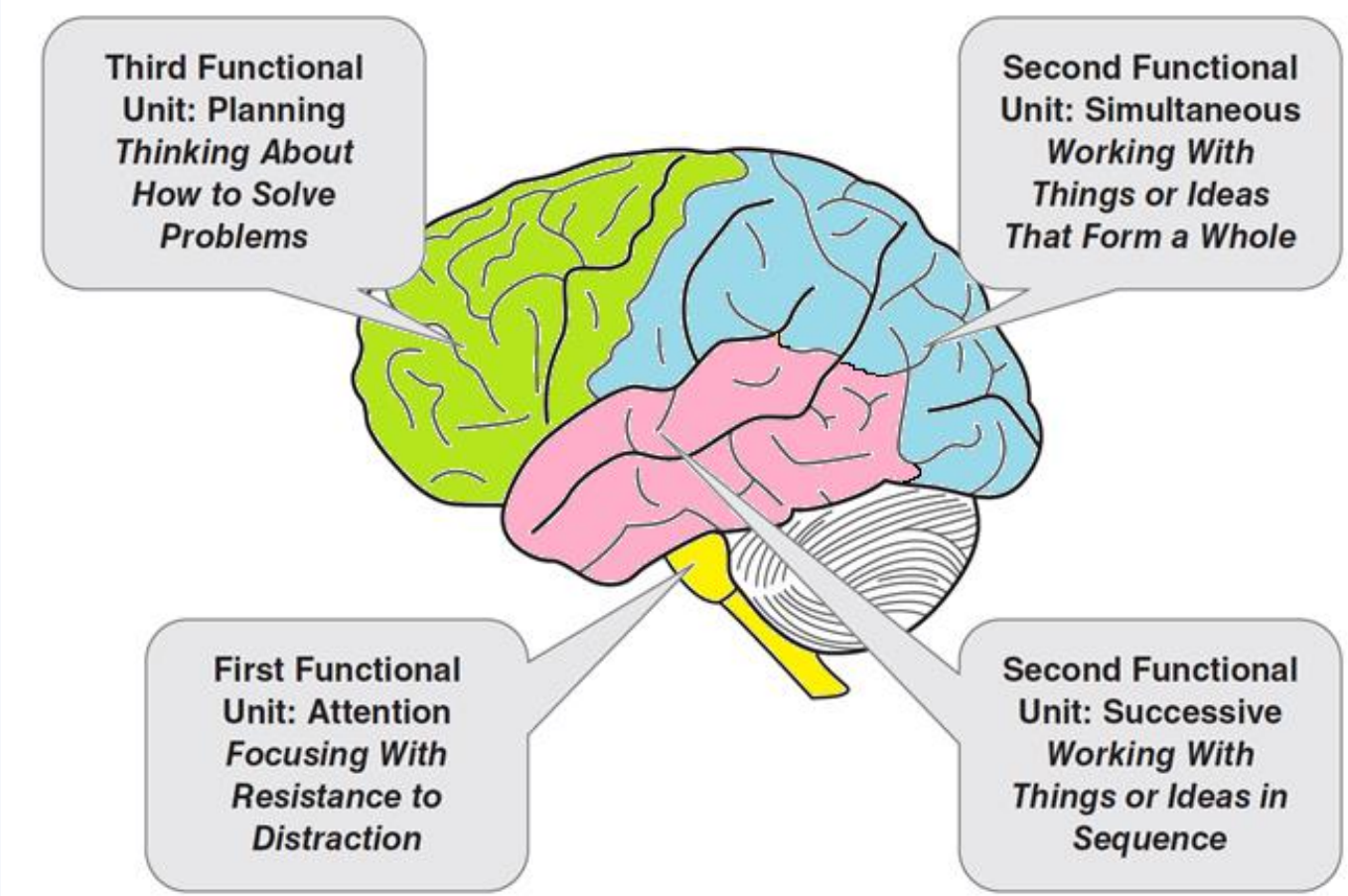


Figure 1.2 Three Functional Units and Associated Brain Structures

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

PASS Theory: Planning

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

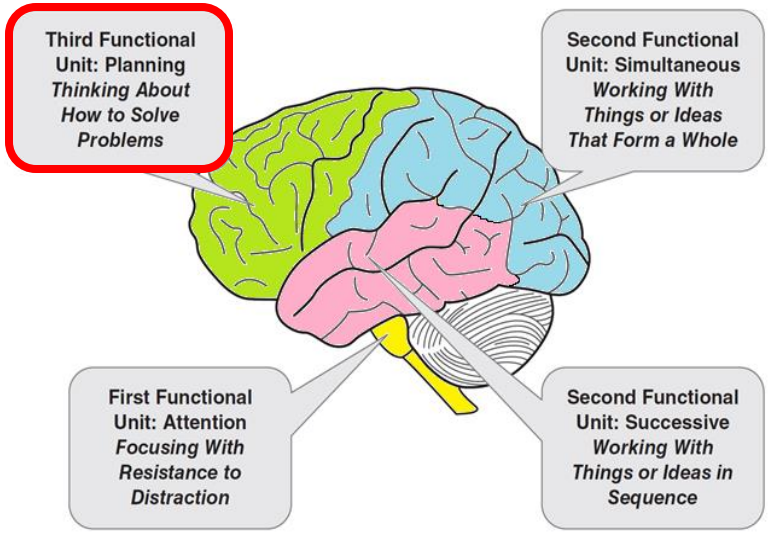
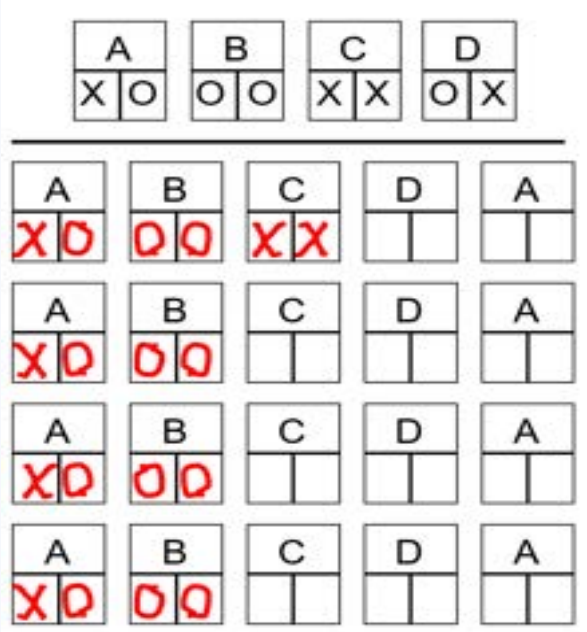


Figure 1.2 Three Functional Units and Associated Brain Structures

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



PASS Theory: Attention

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

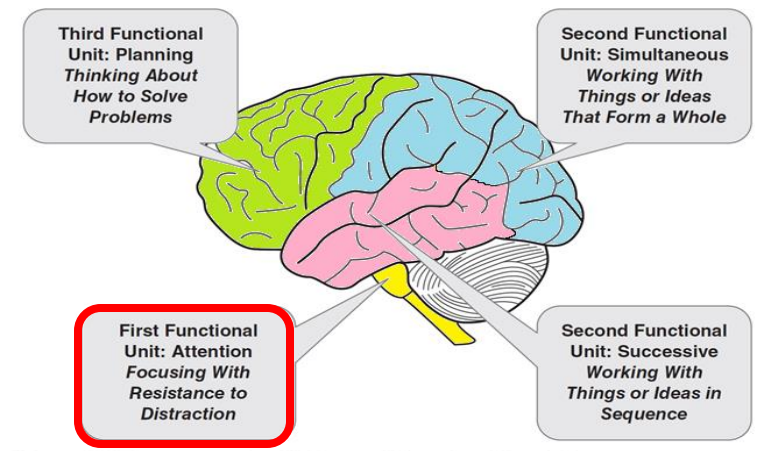


Figure 1.2 Three Functional Units and Associated Brain Structures

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

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

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

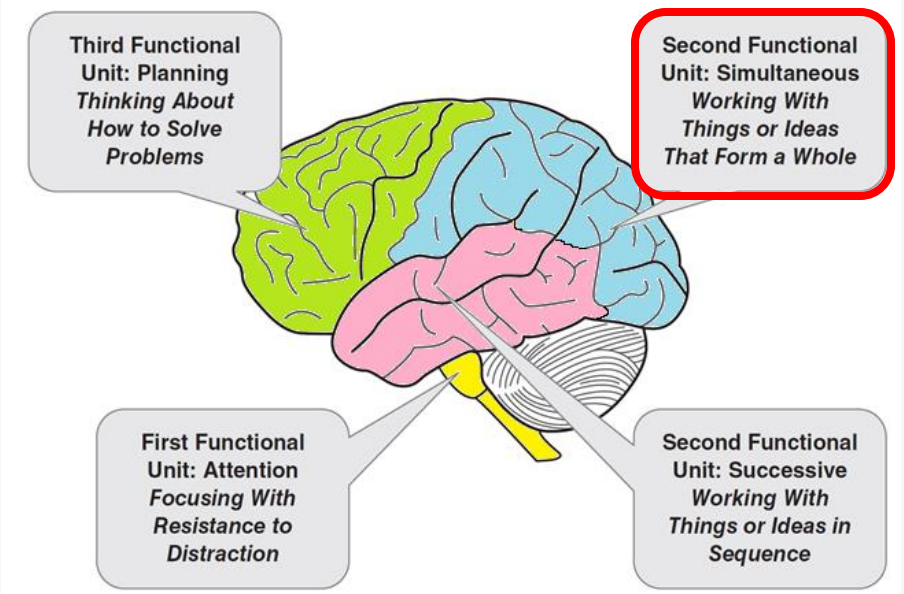
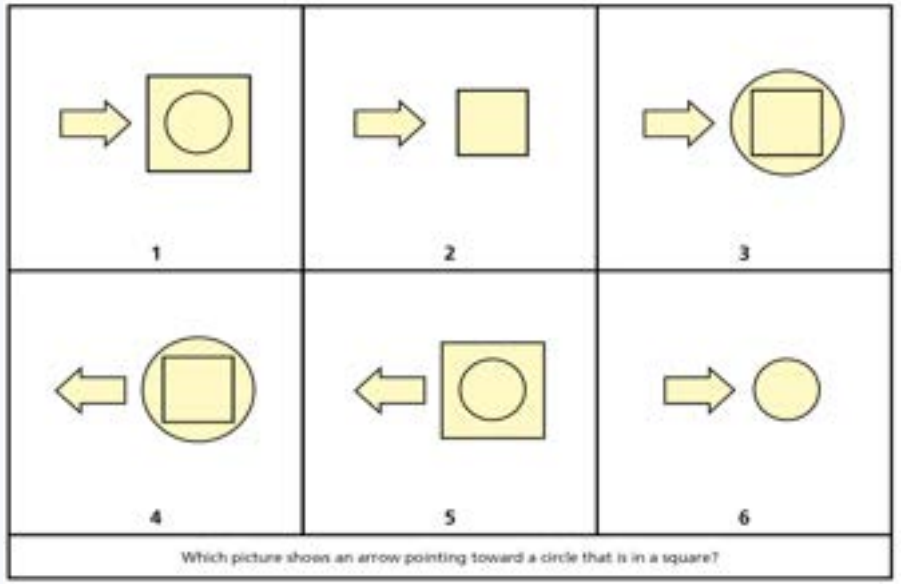


Figure 1.2 Three Functional Units and Associated Brain Structures

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

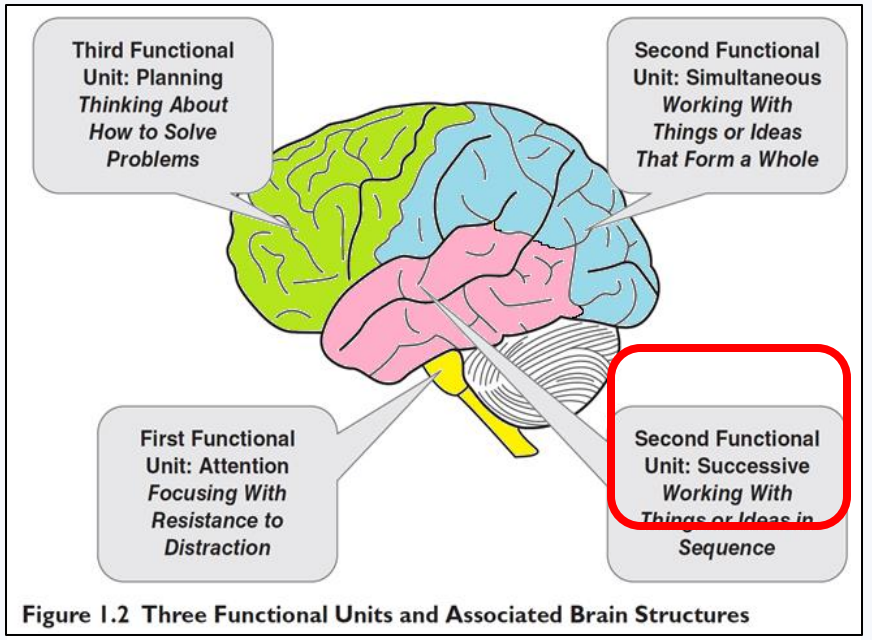
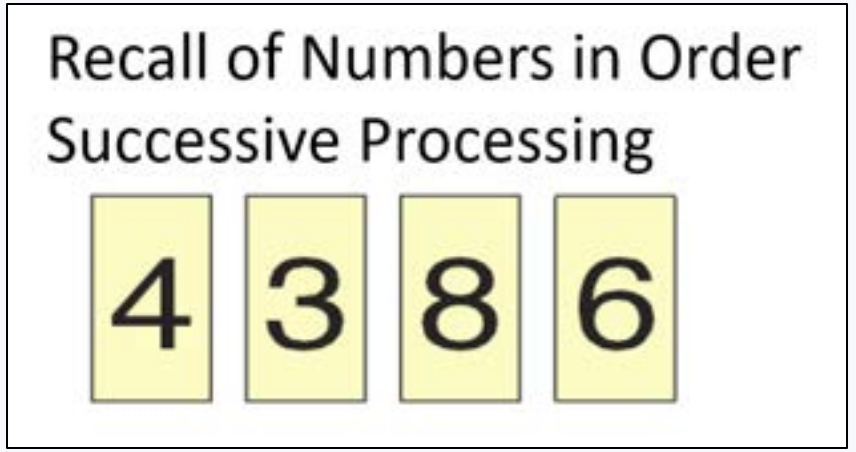


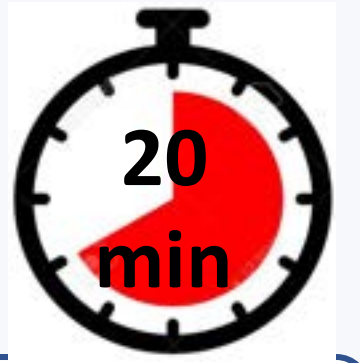
Figure 1.2 Three Functional Units and Associated Brain Structures

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



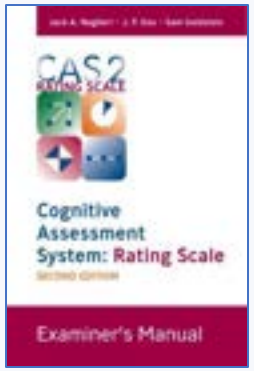
How to Measure PASS with CAS2

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



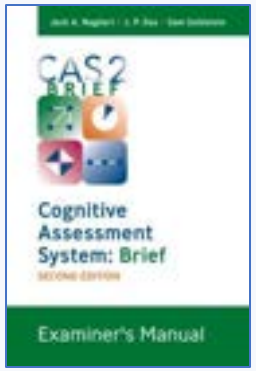
CAS2 Rating Scale
(4 subtests)

Total Score
Planning
Simultaneous
Attention
Successive



CAS2 Brief
(4 subtests
20 minutes)

Total Score
Planning
Simultaneous
Attention
Successive



CAS2 Core
(8 subtests
40 minutes)

Full Scale
Planning
Simultaneous
Attention
Successive

CAS2 Extended
(12 subtests
60 minutes)

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

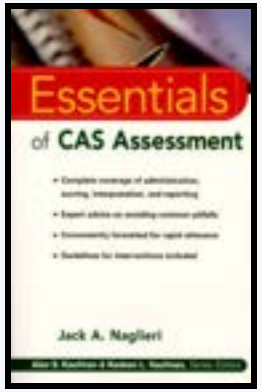
CAS2 Digital (English & Spanish) coming in 2022

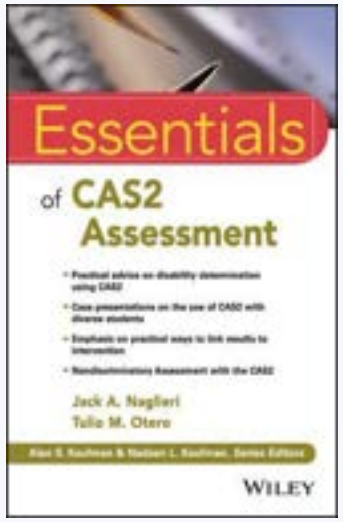
How to use PASS Neurocognitive Theory to Identify a Student with a Specific Learning Disability

SLD Identification should MATCH IDEA definition

Discrepancy Consistency Method (DCM)

- …first introduced in 1999 and most recently in 2017





jnaglieri@gmail.cc

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

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

DON'T FORGET 3.5

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

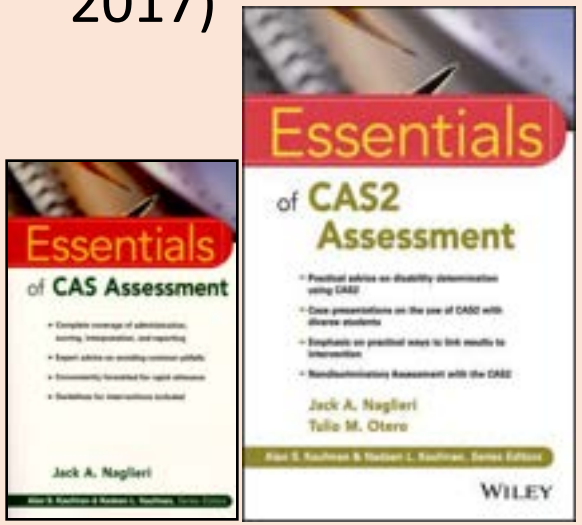
Discrepancy 1:
Significant variability among the PASS scores indicating a weakness in one or more of the basic psychological processes

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

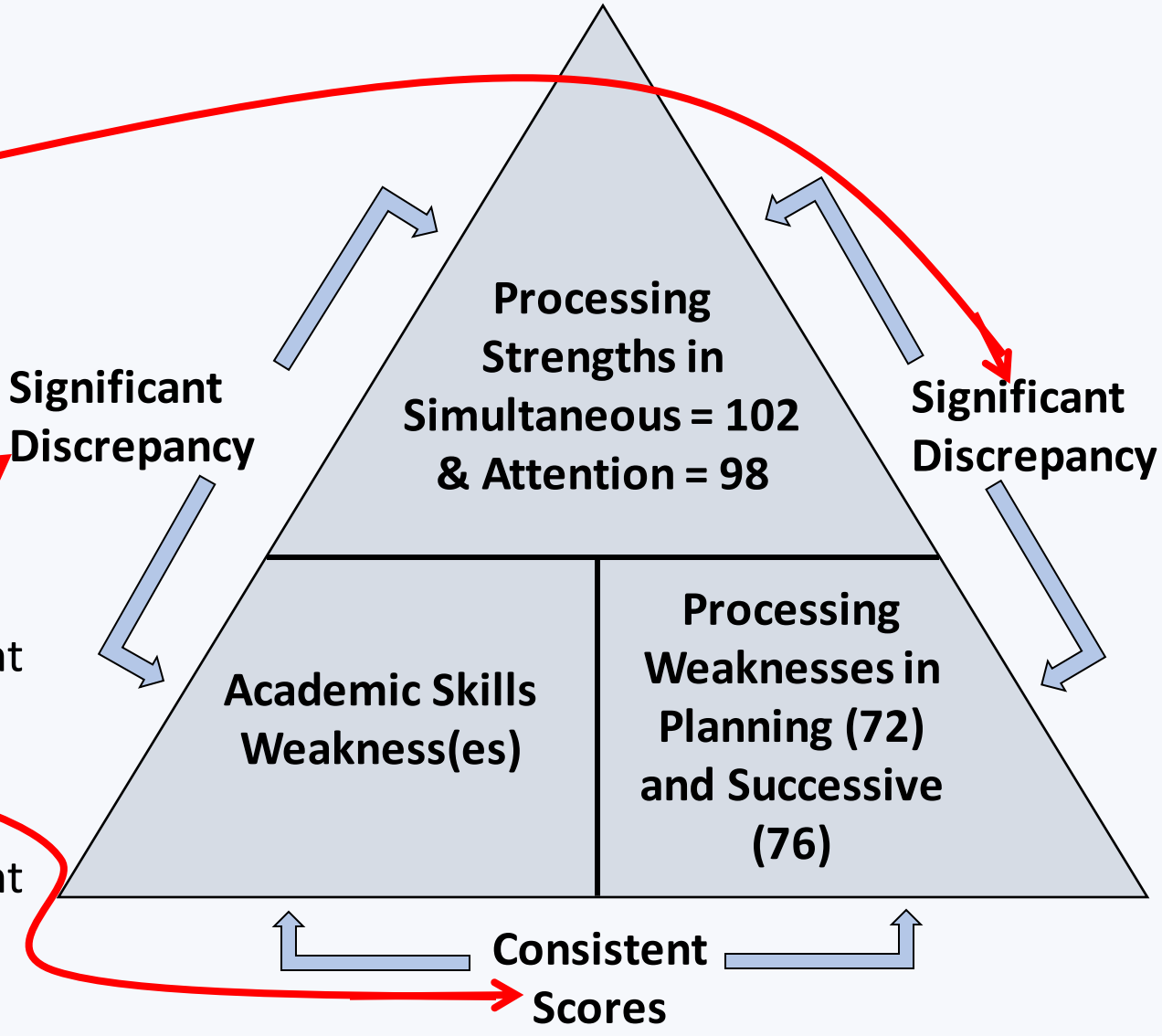
Consistency:
No significant difference between low PASS scores and low achievement

Answering the Question: Why students succeed & struggle

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



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



Discrepancy Consistency Method (Naglieri & Otero, 2017)

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

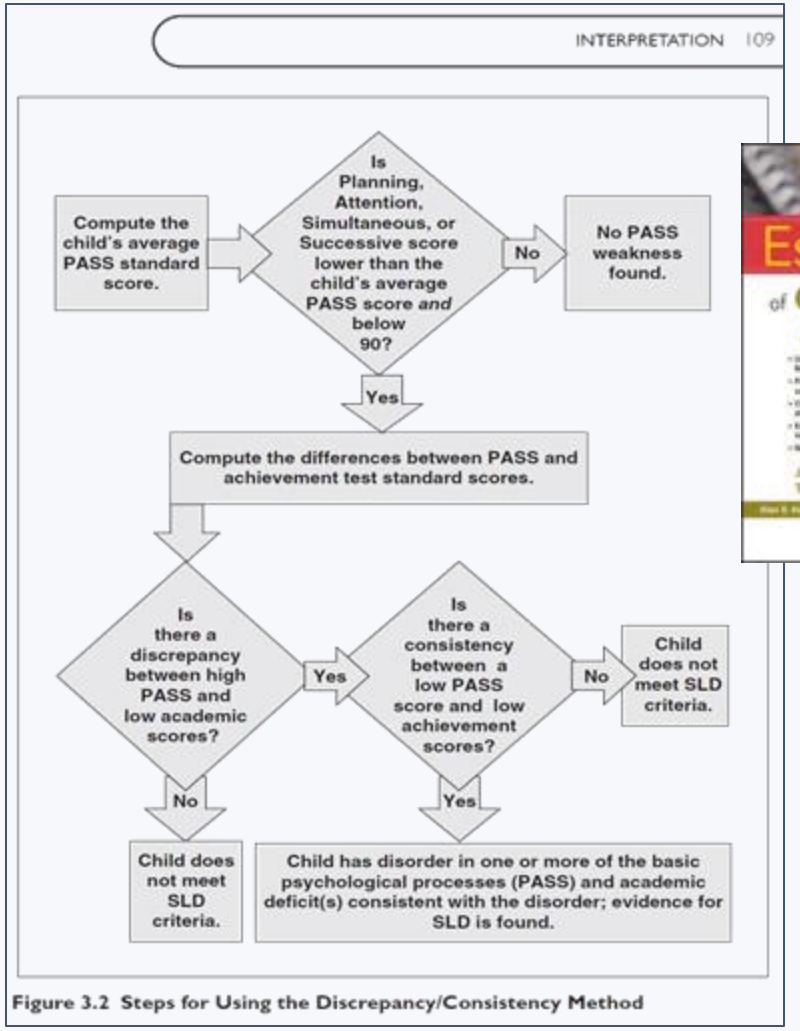
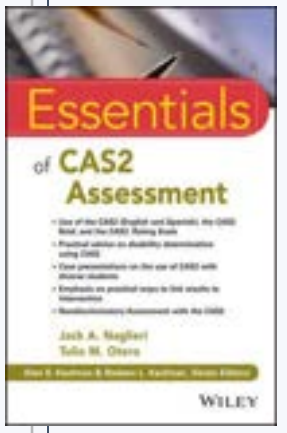
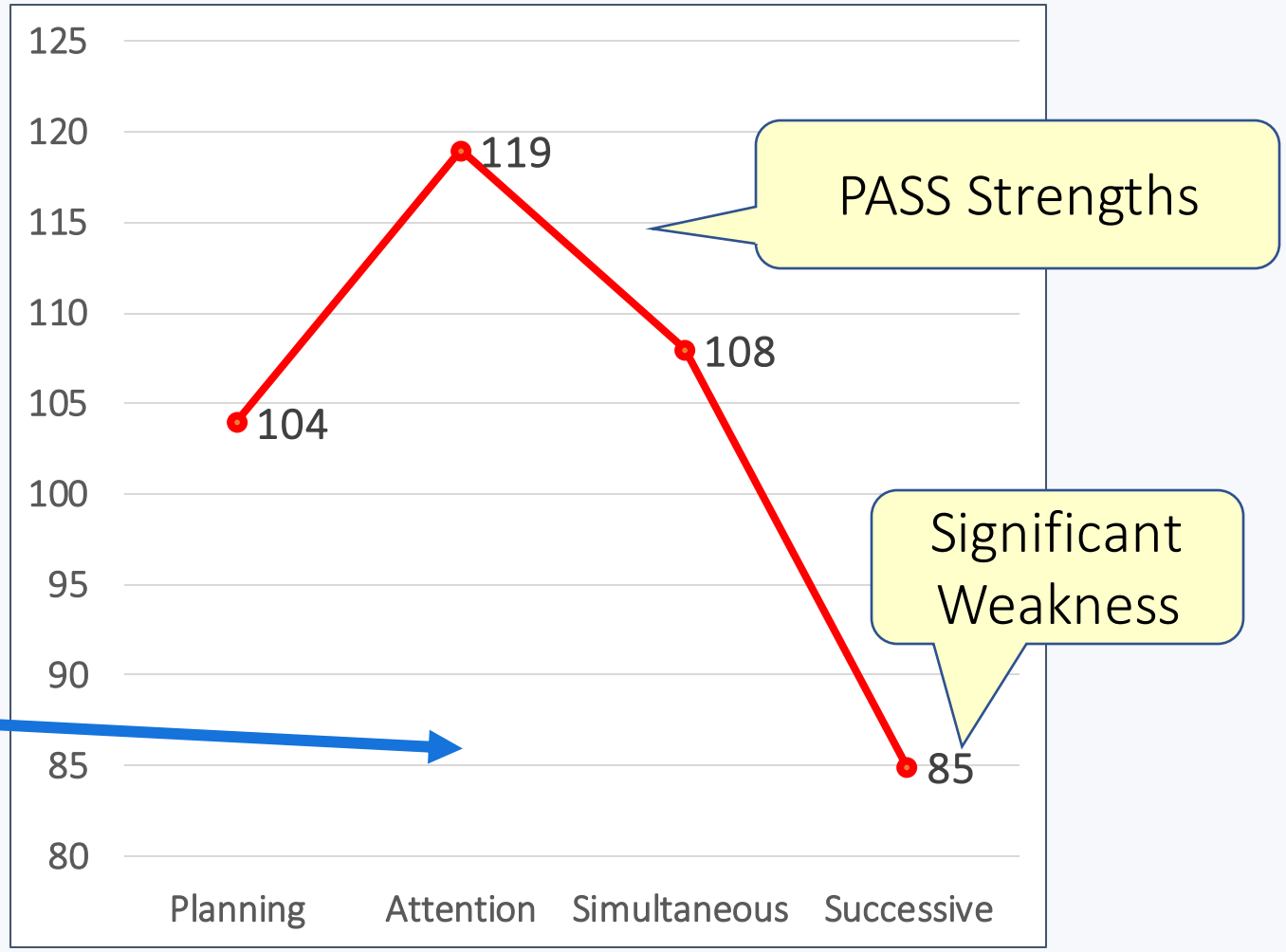


Figure 3.2 Steps for Using the Discrepancy/Consistency Method

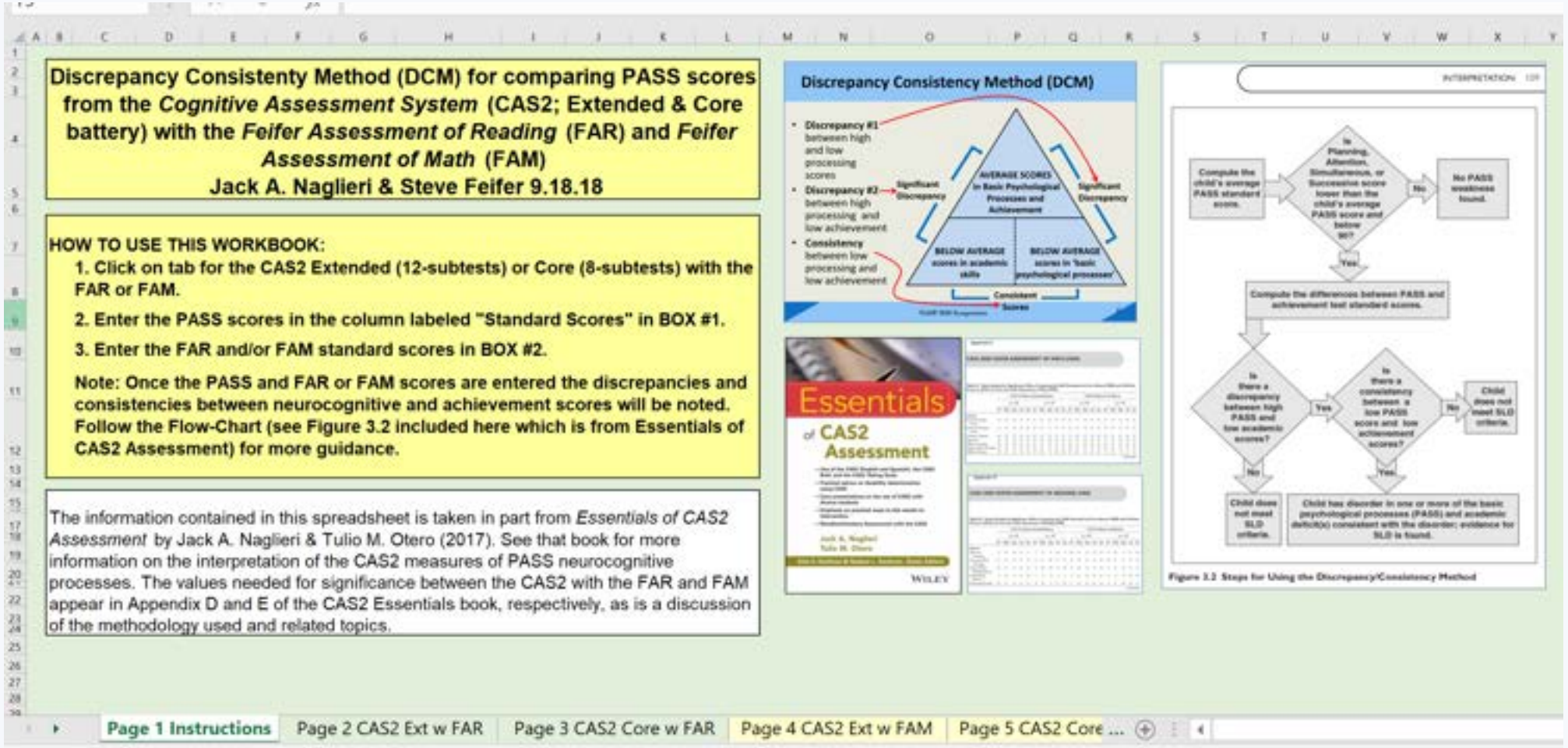


Evidence of a Disorder in Basic Psychological Processes

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

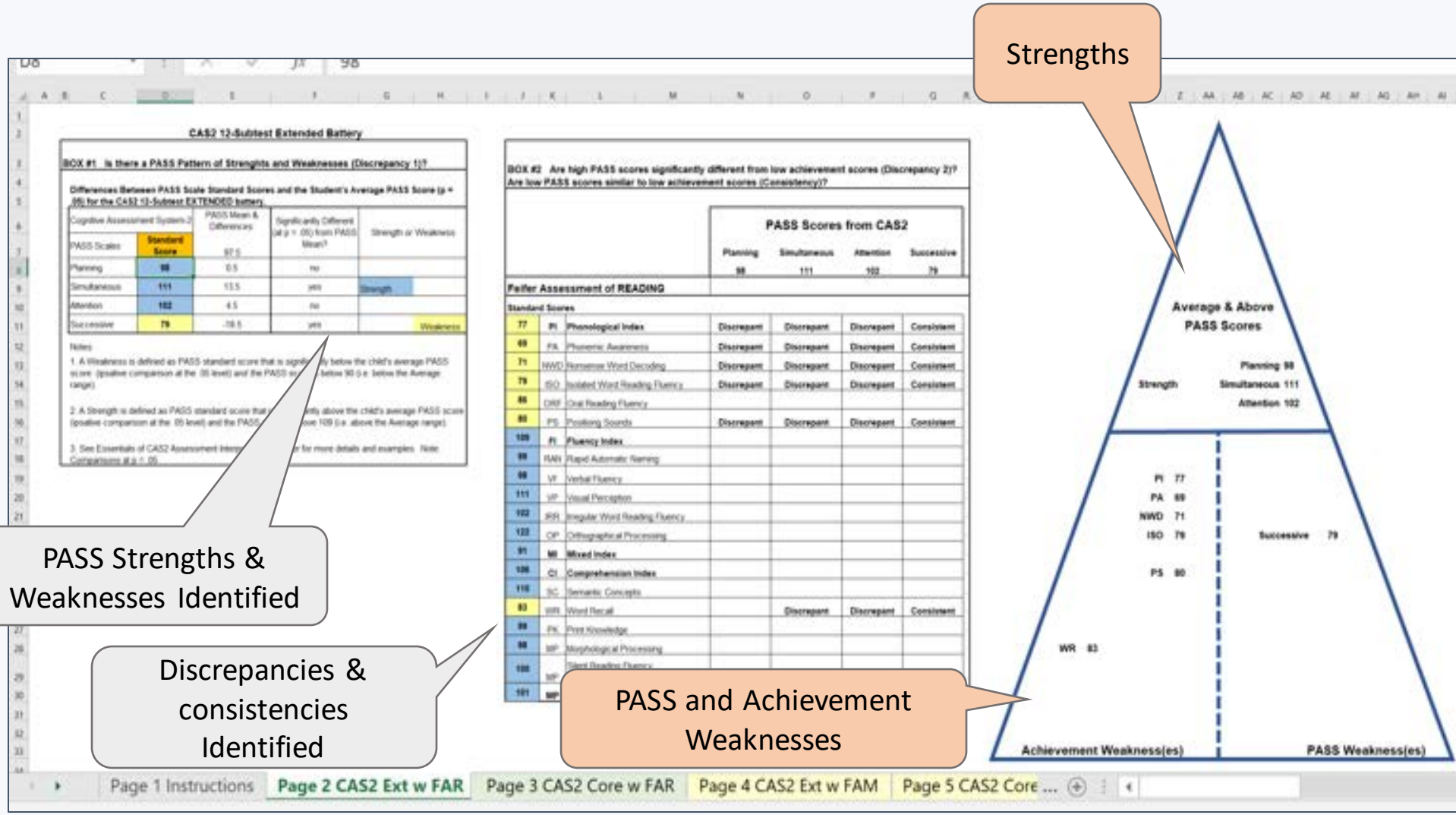


FREE CAS2 PSW Analyzer for FAR, FAM, & FAW, WJ4, KTEA3, WIAT4



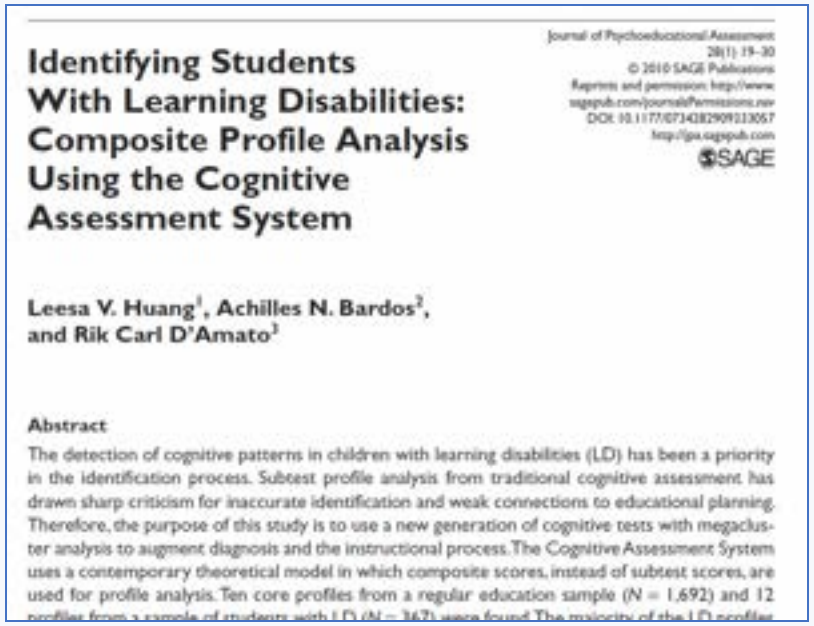
CAS2 PSW Analyzer for WJ4, KTEA3, FAR, FAM

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



Research on PASS Profiles

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

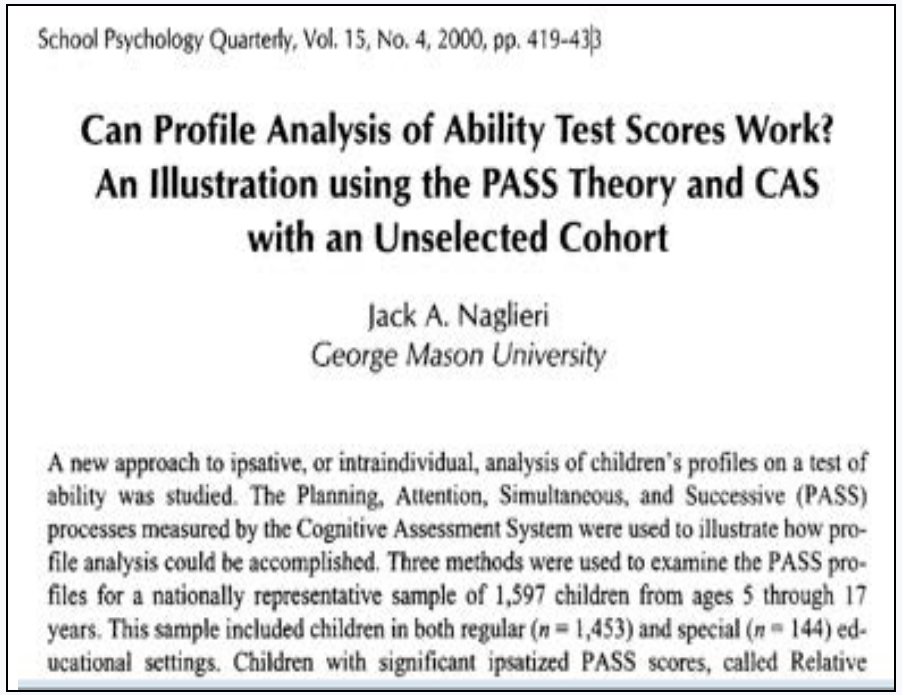


Identifying Students With Learning Disabilities: Composite Profile Analysis Using the Cognitive Assessment System

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

Abstract

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



School Psychology Quarterly, Vol. 15, No. 4, 2000, pp. 419-43[illegible]

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

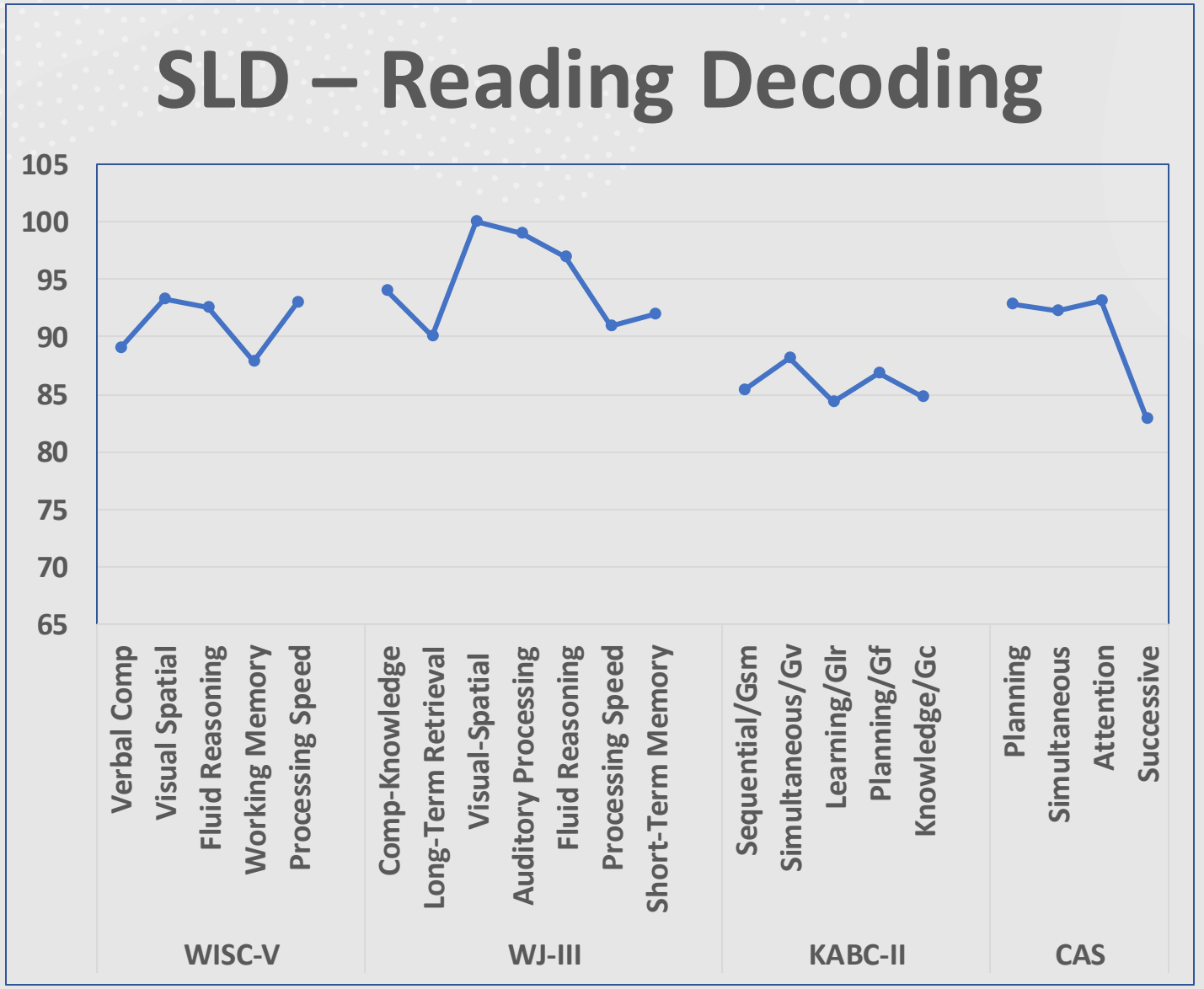
Jack A. Naglieri
George Mason University

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

"Ten core profiles from a regular education sample (N = 1,692) and 12 profiles from a sample of students with LD (N = 367) were found.

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

PASS Profile reveals Successive processing weakness



ADHD Assessment

‘basic psychological processes associated with ADHD’

Gifted & ADHD

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

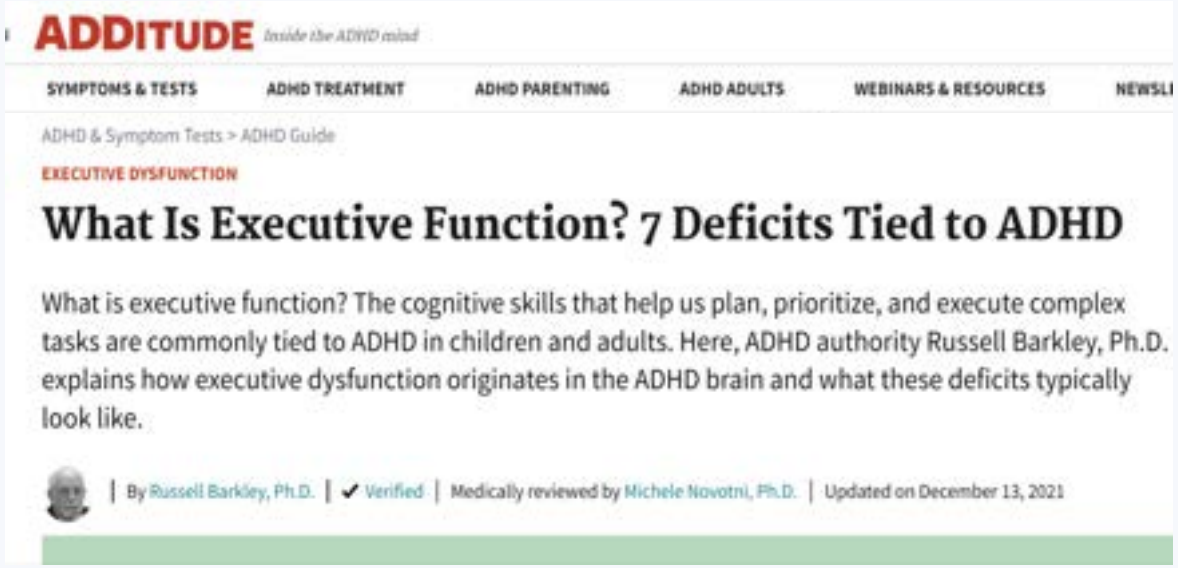
DSM-5 Diagnostic Criteria for ADHD

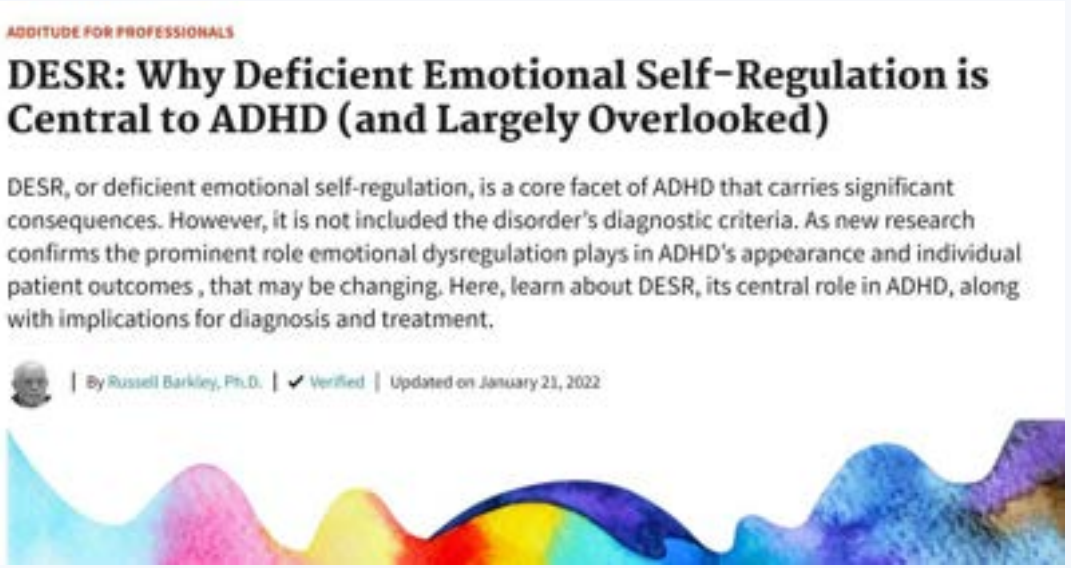
Symptoms and/or behaviors that have persisted ≥ 6 months in ≥ 2 settings (e.g., school, home, church). Symptoms have negatively impacted academic, social, and/or occupational functioning. In patients aged < 17 years, ≥ 6 symptoms are necessary; in those aged ≥ 17 years, ≥ 5 symptoms are necessary.	
Inattentive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

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

ADHD & Executive Function – Russell Barkley

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





Executive Function Rating Scales

Some published rating scales

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

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

If Executive Function Underlies ADHD

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

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

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

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

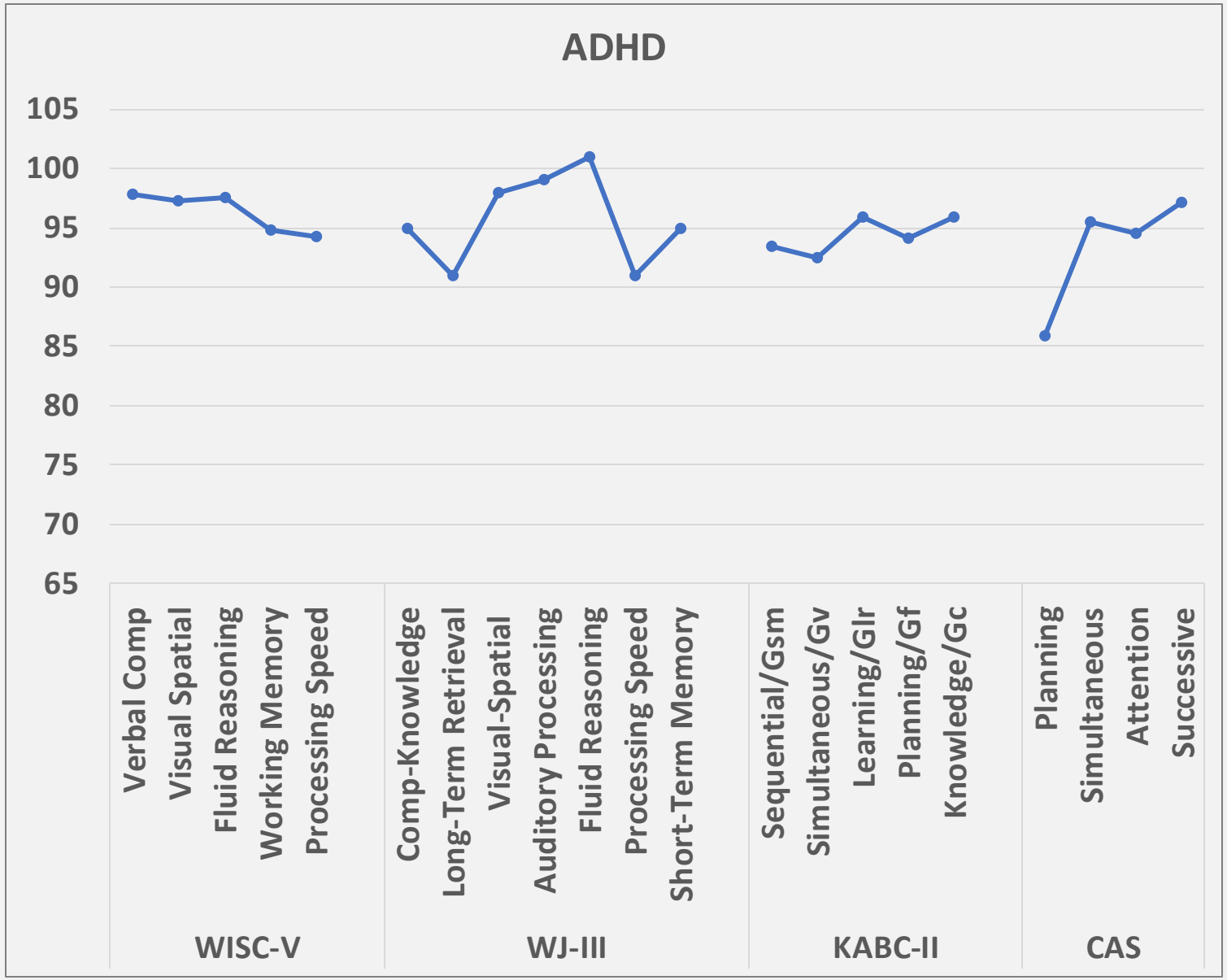
If EF may be the Issue…

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

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

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

PASS Profile reveals Planning processing weakness



Assessment of ADHD

- **Is there impairment?**

Specify if:

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

Specify current severity:

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

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

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

Rating Scale of Impairment (RSI; Goldstein & Naglieri)

Rating Scale of Impairment (RSI) Forms & Scores

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

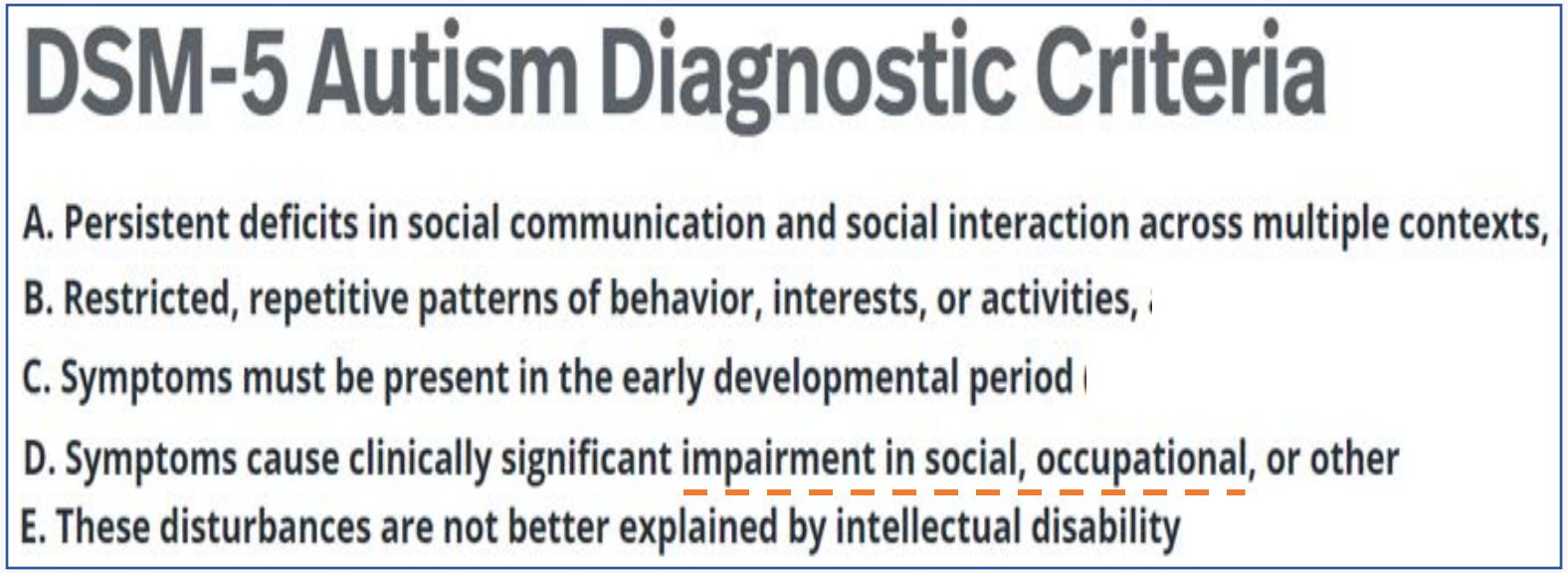
Assessment of Individuals with Autism Spectrum Disorder

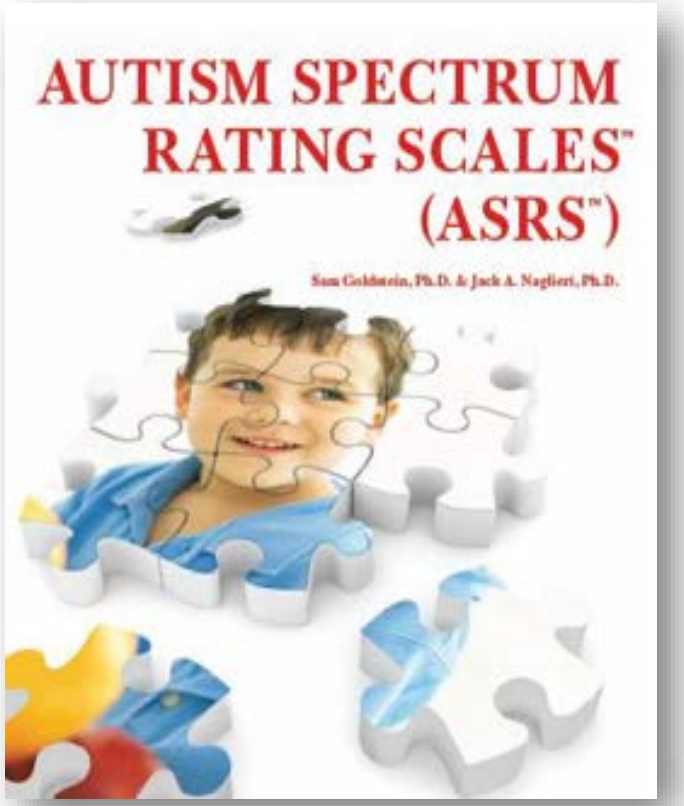
Why measure ‘basic psychological processes’

Gifted Students with Disabilities

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

  - ASD is identified using the DSM based on observable behaviors
  - Rating scales such as ASRS

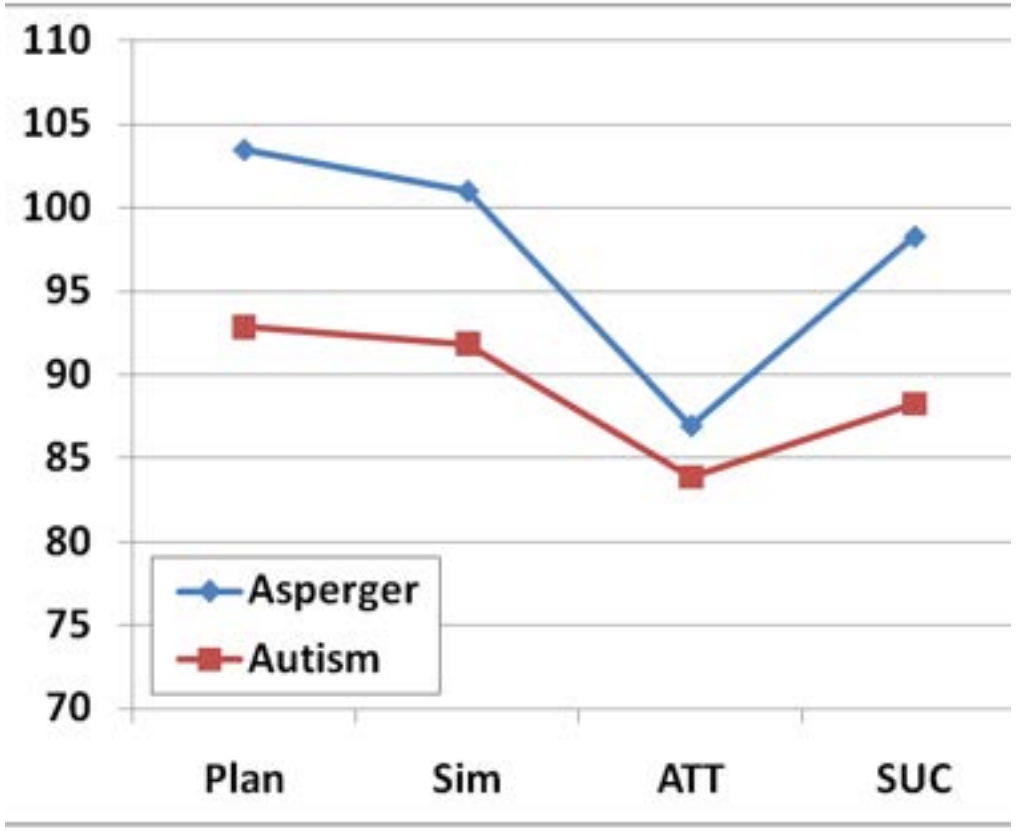




Behavioral Evaluation of ASD

Parents and teacher Rating Scales for ages 2 – 18 years

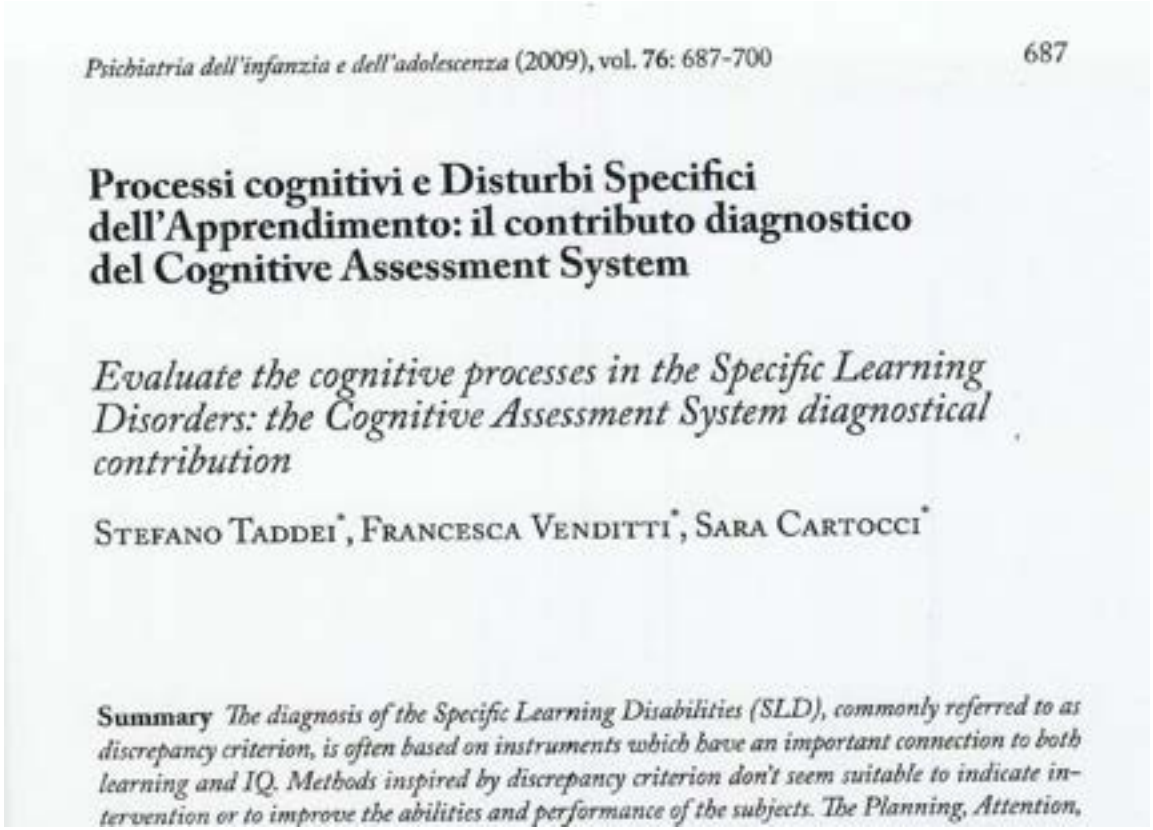
PASS Scores, Autism and Asperger



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

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

ASD - Italy



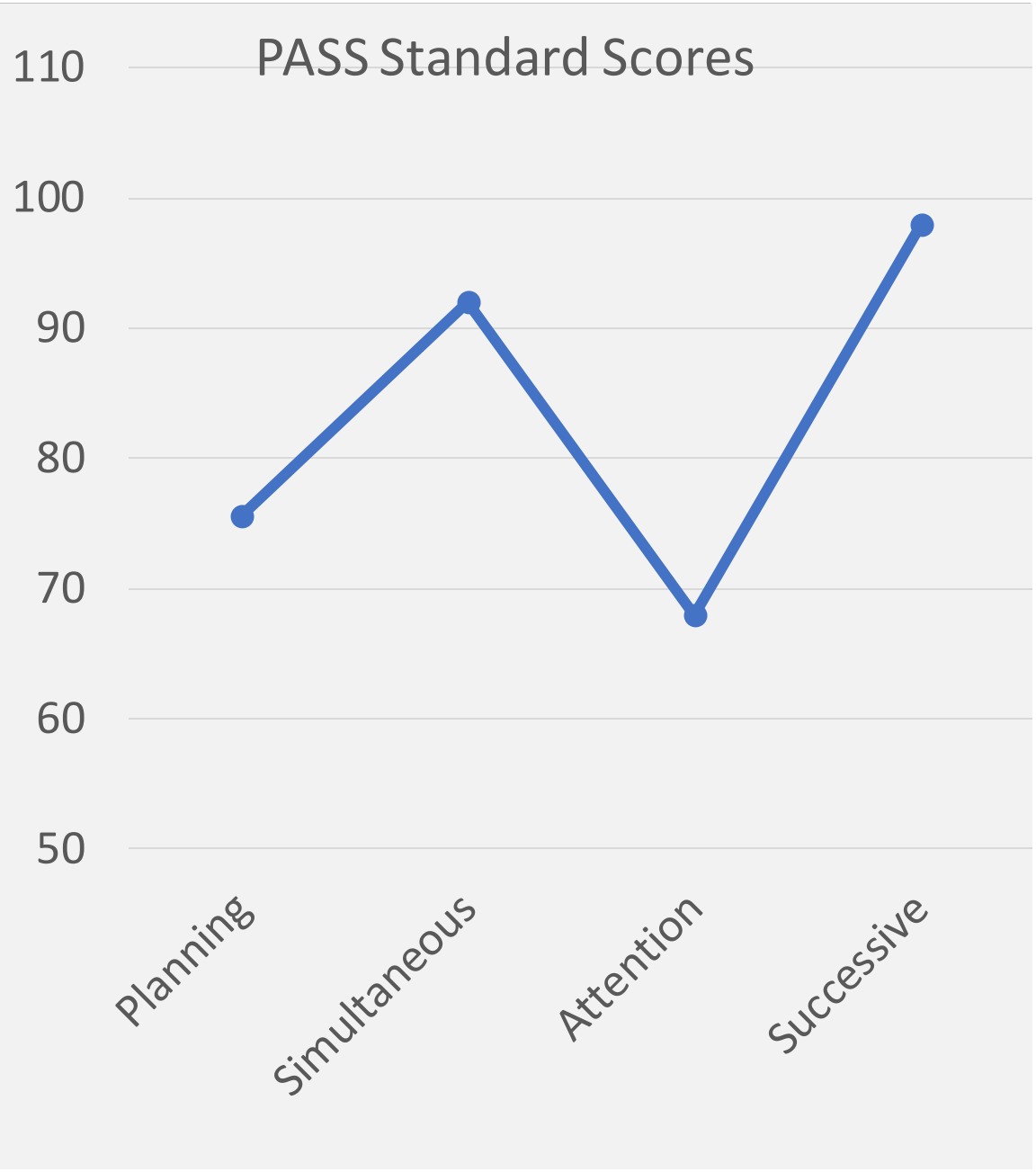
Psichiatria dell'infanzia e dell'adolescenza (2009), vol. 76: 687-700 687

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

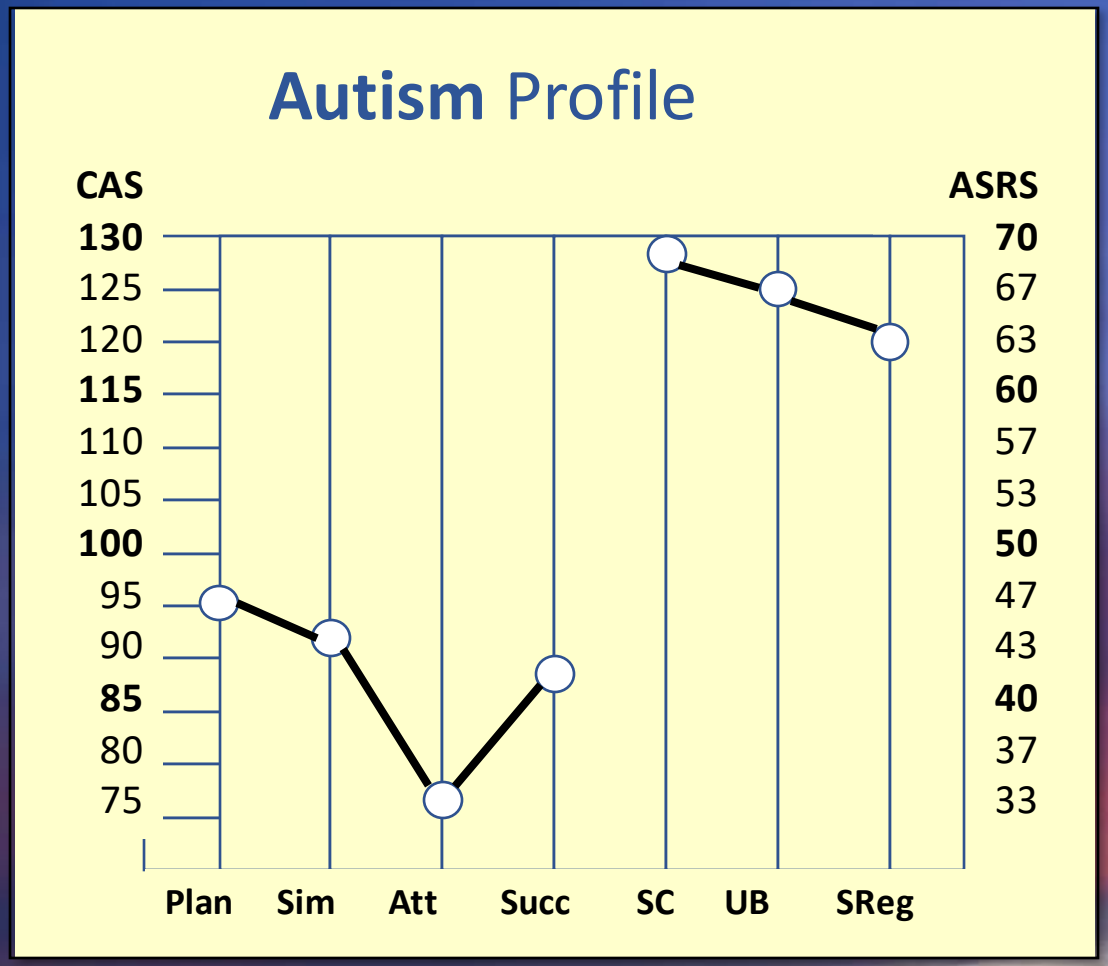
Evaluate the cognitive processes in the Specific Learning Disorders: the Cognitive Assessment System diagnostical contribution

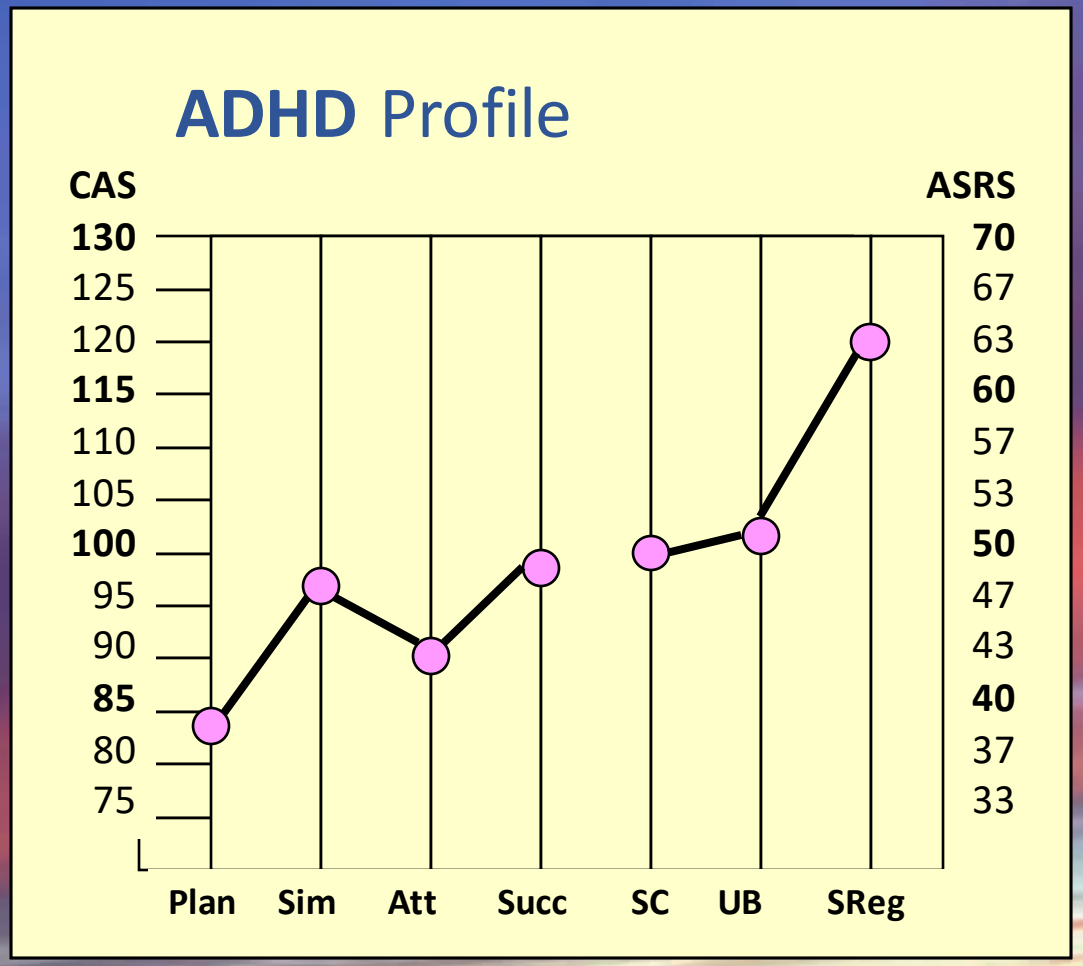
STEFANO TADDEI*, FRANCESCA VENDITTI*, SARA CARTOCCI*

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



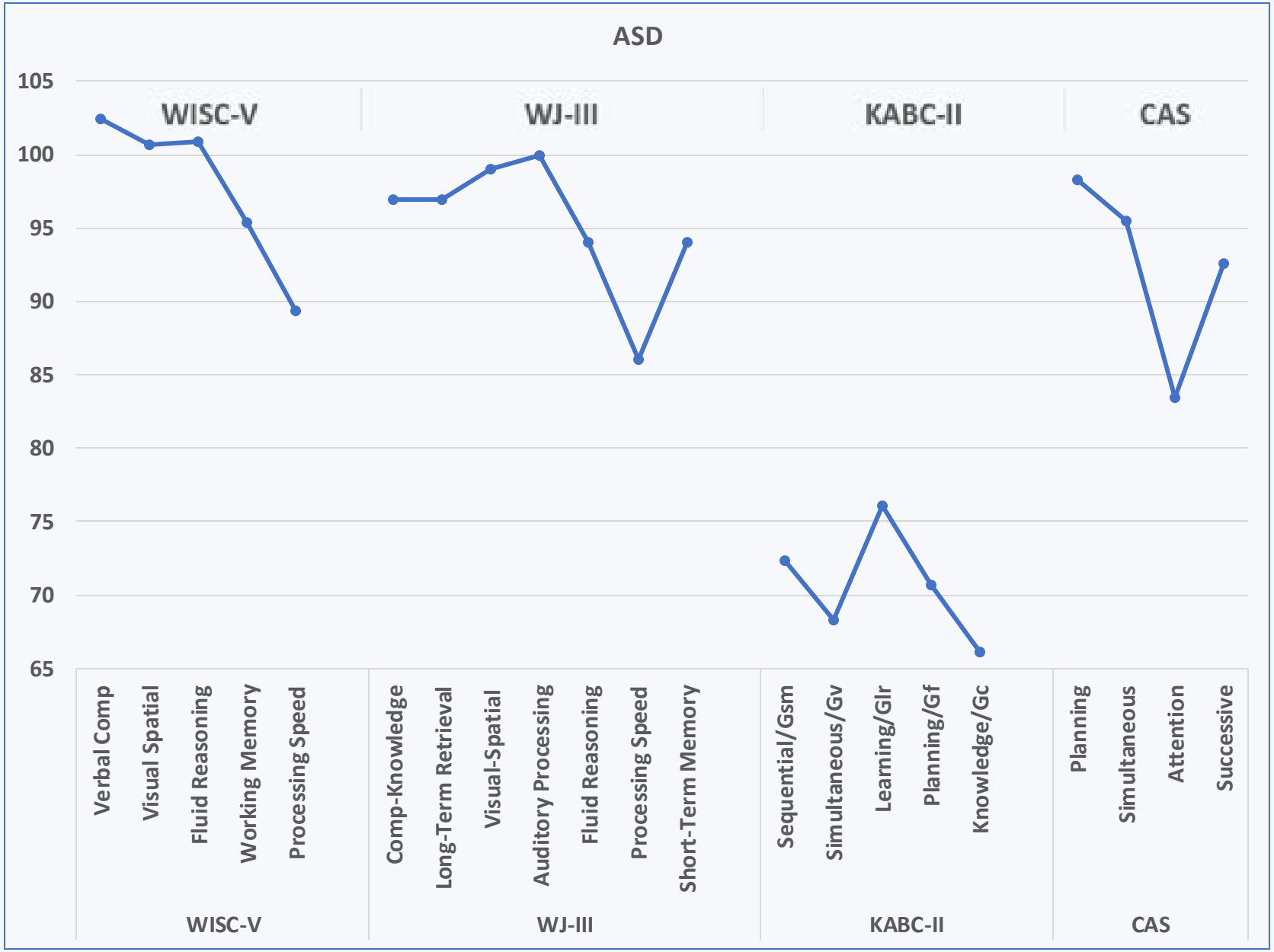
Differential Diagnosis: ADHD vs ASD





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

PASS Profile reveals Attention processing weakness



Ideas to Consider

- My equity journey
- New tests of General Ability
- What is General Ability
- Identification of gifted students
- Local and National Norms
- Twice Exceptional gifted students with
  - SLD
  - ADHD
  - ASD
- PASS validity, profiles and interpretation

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

Hierarchical Factor Structure of the Cognitive Assessment Systen 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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PASS theory of intelligence and academic achievement: A meta-analytic review

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

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ABSTRACT

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

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

PASS Meta-Analysis

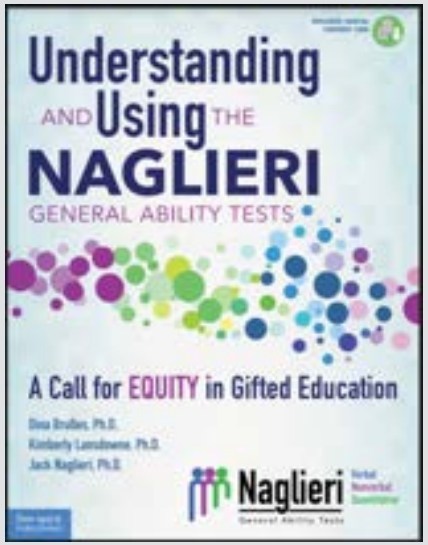
- "The CAS Full Scale correlates **.60 with reading** and **.61 with mathematics**."
- "**These correlations are significantly stronger … than the correlations reported in previous meta-analysis for other measures of intelligence** (e.g., Peng et al., 2019; Roth et al., 2015)…(e.g., WISC) that include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

Race and Ethnic Differences by Ability Test

Intelligence Test Mean Standard Score Differences by Race and Ethnicity.		
	Race	Ethnicity
Tests that require knowledge	**11.5**	**9.2**
Otis-Lennon School Ability Test (school system)	13.6	
Stanford-Binet IV (normative sample)	12.6	
WISC-V (normative sample)	11.6	
WJ- III (normative sample)	10.9	10.7
CogAT7 (Nonverbal scale)	11.8	7.6
WISC-V (statistical controls normative sample)	8.7	
Tests that require minimal knowledge	**3.5**	**2.6**
CAS-2 (normative sample)	6.3	4.5
CAS (statistical controls normative sample)	4.8	4.8
CAS-2 (statistical controls normative sample)	4.3	1.8
CAS-2 Brief (normative samples)	2.0	2.8
[illegible]	[illegible]	[illegible]
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

Tests that demand academic knowledge

Tests that do NOT demand academic knowledge



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

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).

Notes: 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 & Oakland (2006) and ethnic differences by Sotelo-Dynega, Ortiz, Flanagan & Chaplin (2013); CogAT7 by Carman, Walther and Bartsch (2018); WISC-V by Kaufman, Raiford & Coalson (2016); Kaufman Assessment Battery for Children-II by Lichenberger, Sotelo-Dynega and Kaufman (2009); CAS by Naglieri, Rojahn, Matto & Aquilino (2005); CAS-2 and CAS2:Brief by Naglieri, Das & Goldstein, 2014; Naglieri Nonverbal Ability Test by Naglieri and Ronning (2000), and Naglieri General Ability Tests by Naglieri, Brulles and Lansdowne (2021).

PASS Profiles for Individuals with SLD, ADHD, & ASD

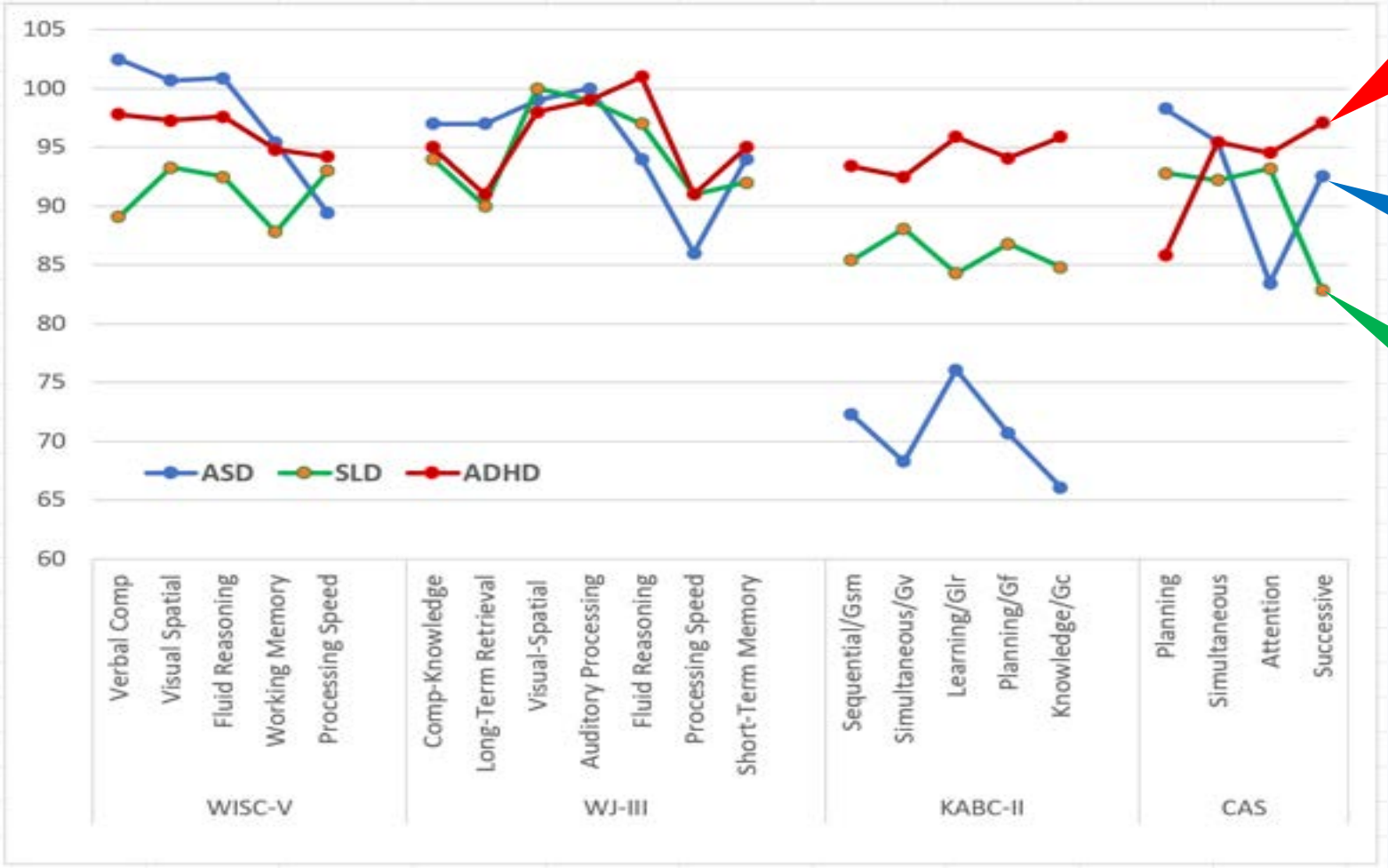
Getting the BIG PICTURE

Patterns of Strengths & Weaknesses

These profiles across tests is very revealing

-

PASS works



ADHD (Low Planning)

ASD – Low Attention

Dyslexia – Low Successive

PASS Profiles for Gifted Students

Application of the Discrepancy Consistency Method

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

- N = 142
  - Similar numbers of girls and boys in Grade 4, 5 and 6.
  - all native speakers of English
  - from middle to upper-middle socioeconomic families
- Gifted definition:
  - "Giftedness is exceptional potential and/or performance across a wide range of abilities in one or more of the following areas: general intellectual, specific academic, creative thinking, social, musical, artistic and kinesthetic" (Alberta Education, 2012, p. 6).

- Tests given
  - WASI –II (Vocabulary and Matrix Reasoning)
  - Woodcock-Johnson III Broad Reading score from: Letter-Word Identification, Reading Fluency, and Passage Comprehension
  - Cognitive Assessment System (CAS; Naglieri & Das, 1997) to measure PASS neurocognitive processes

A Study of Gifted Students

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

Table 2

Pearson Correlations of WASI-II FSIQ, Cognitive As

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

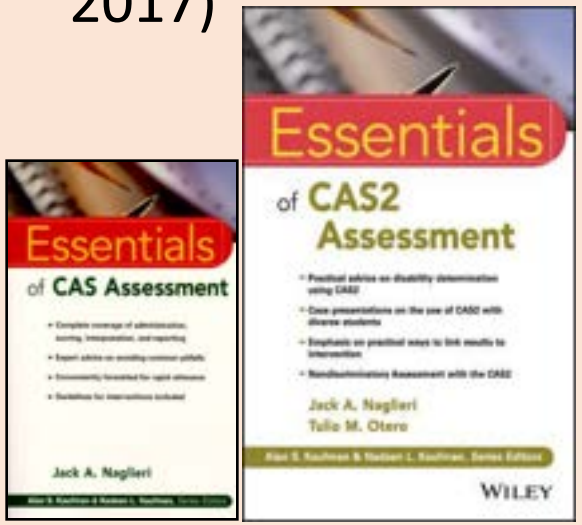
Table 1

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

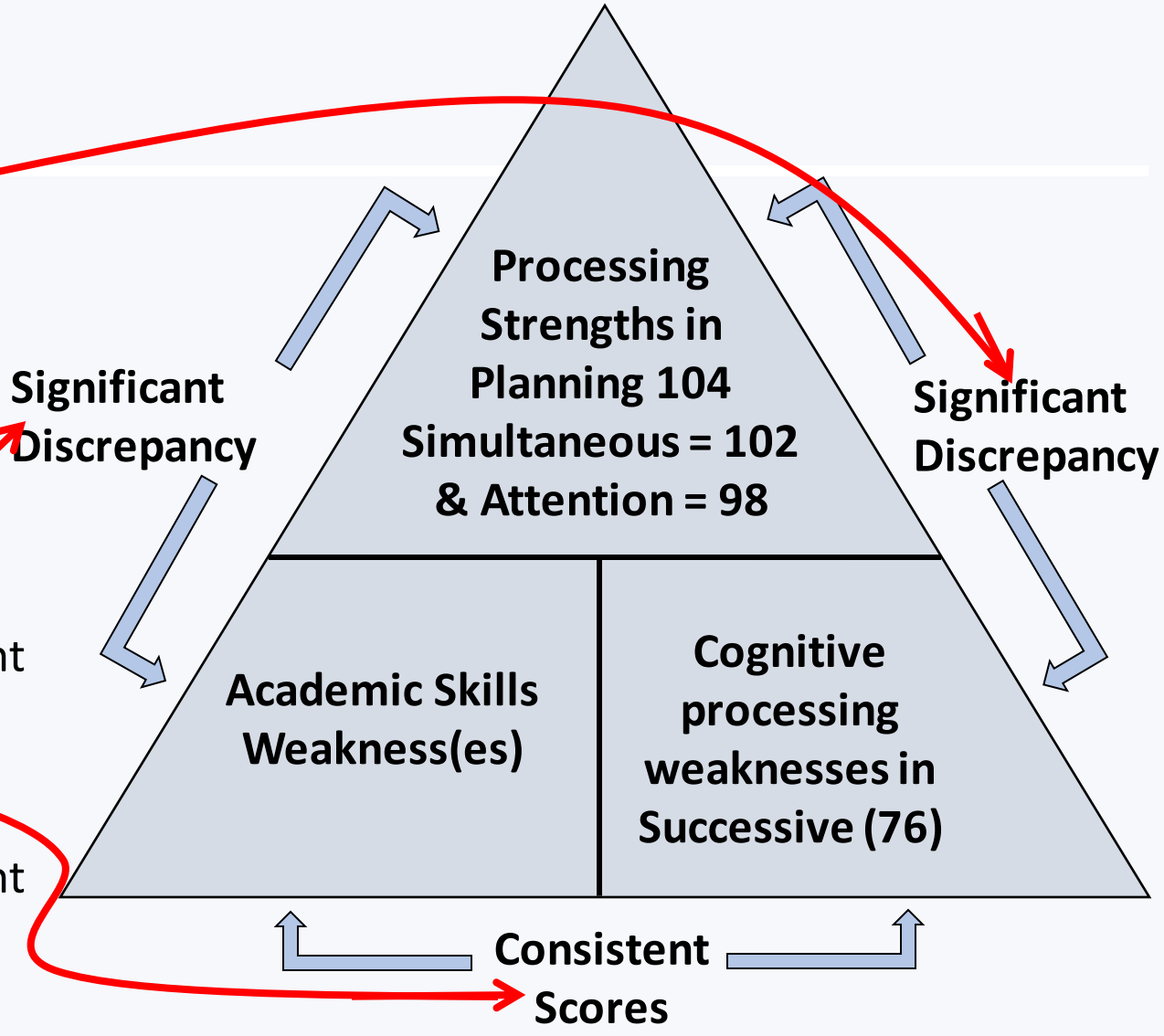
Variable	*Mean*	*SD*	*Min*	*Max*
WJ-III Achievement				
Broad Reading	**125**	14	97	166
Broad Math	**116**	13	91	162
Mean WJ	**117**	10	94	152
WASI-II FSIQ	**123**	8	105	145
CAS Full Scale	**118**	12	91	148
Planning	**110**	12	77	146
Simultaneous	**121**	16	88	152
Attention	**113**	13	79	141
Successive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

Answering the Question: Why the student fails?

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

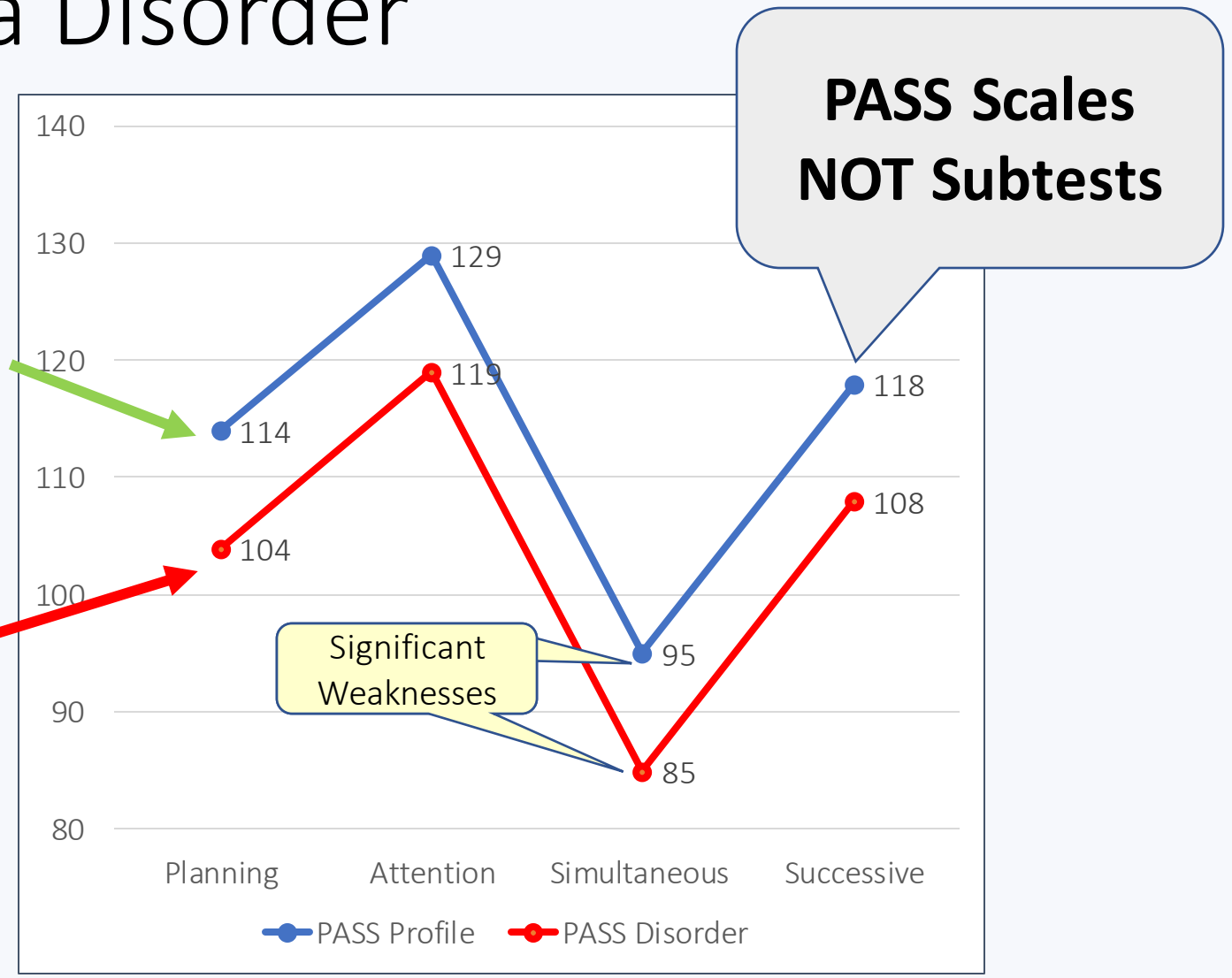


- Discrepancy between high and low processing scores
- Discrepancy between high processing and low achievement
- Consistency between low processing and low achievement



How to Determine a Disorder

- Two types of PASS profile of Strengths & Weaknesses
  - Significant variation in relation to student's average has ***instructional relevance***
  - Significant variation in relation to student's average AND a standard score less than 90 (< 25th %tile) ***supports designation as SLD***



A Study of Gifted Students

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

Table 3.

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

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

A Study of Gifted Students

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

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

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

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

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

Gifted SLD Student Profile

CAS2 8-Subtest CORE Battery

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

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

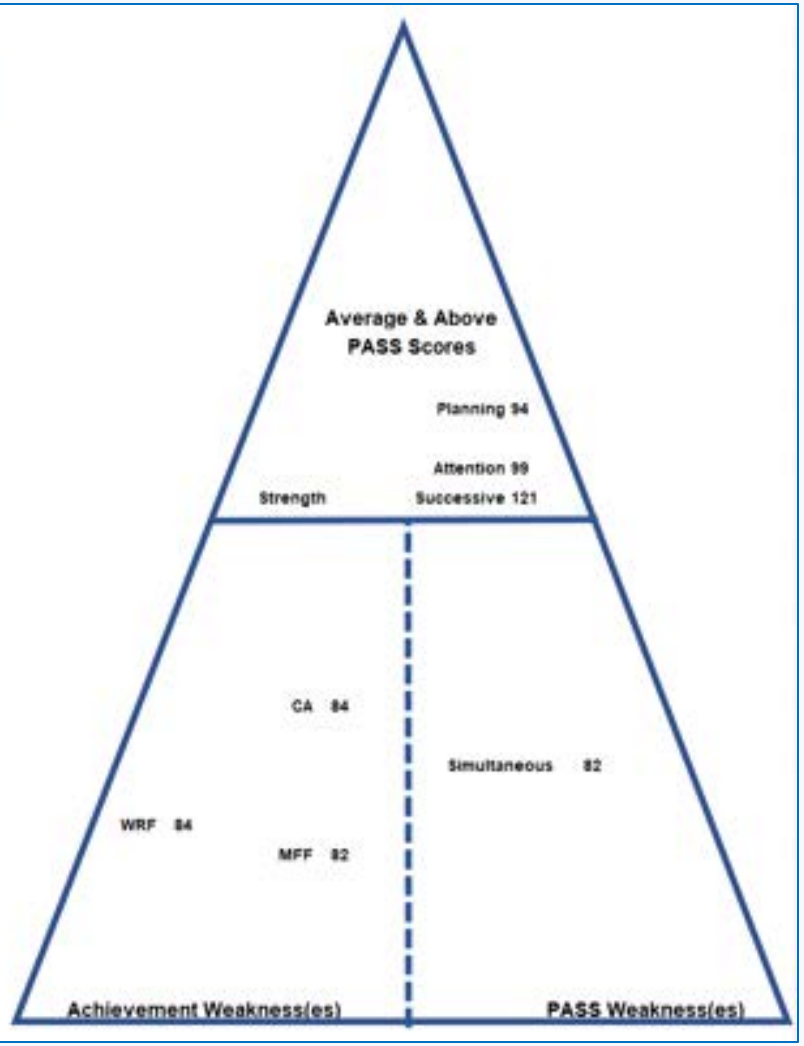
Cognitive Assessment System 2		PASS Mean & Differences	Significantly Different (at p = .05) from PASS Mean?	Strength or Weakness
PASS Scales	Standard Score	99.0		
Planning	94	-5.0	no	
Simultaneous	82	-17.0	yes	Weakness
Attention	99	0.0	no	
Successive	121	22.0	yes	Strength

Notes

1. A Weakness is defined as PASS standard score that is significantly below the child's average PASS score (ipsative comparison at the .05 level) and the PASS score is below 90 (i.e. below the Average range).
2. A Strength is defined as PASS standard score that is significantly above the child's average PASS score (ipsative comparison at the .05 level) and the PASS score is above 109 (i.e. above the Average range).
3. See Essentials of CAS2 Assessment Interpretation Chapter for more details and examples. Note Comparisons made at p = .05

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

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



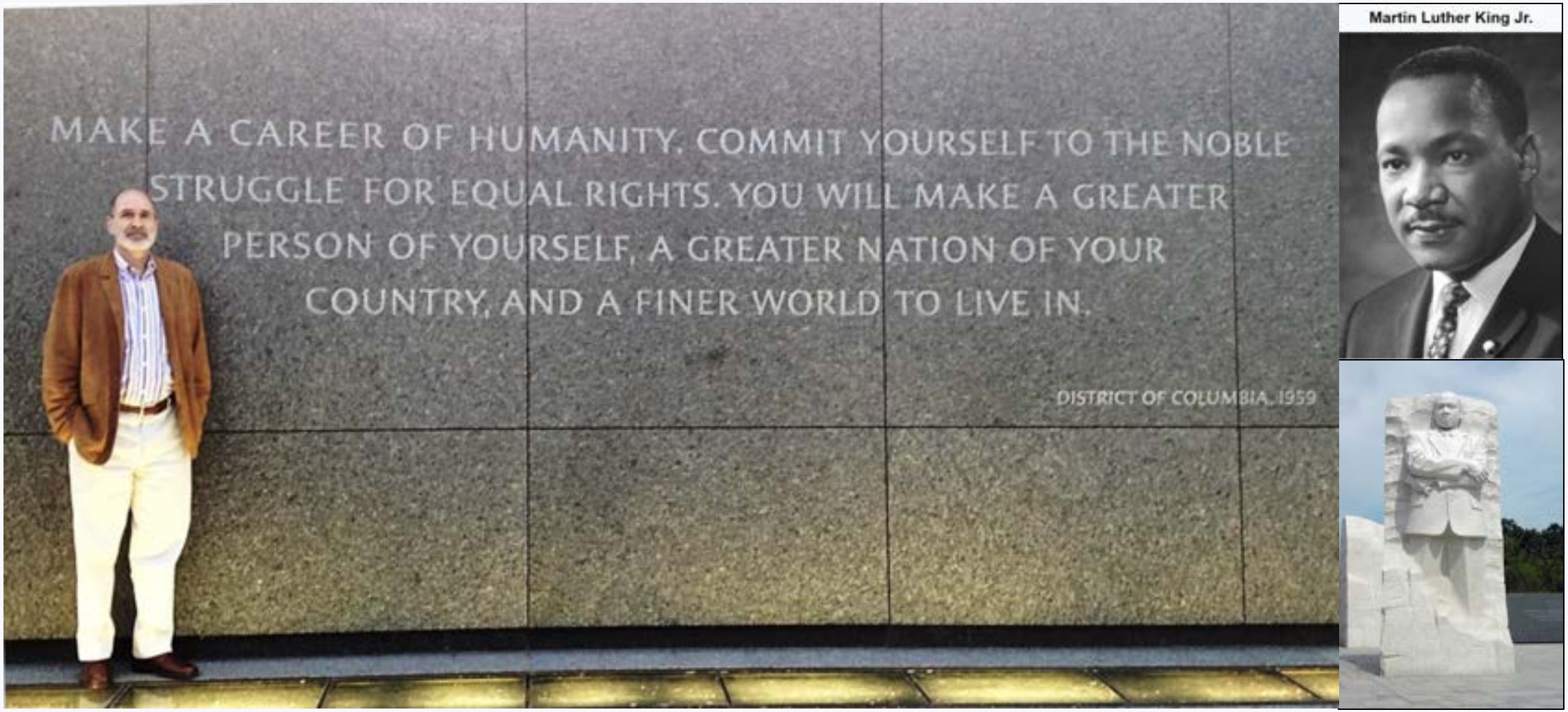
Twice Exceptional **Conclusions**

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

Change Demands Courage to Think Differently

Socially just assessment requires self-reflection (What am I doing?) and self-correction (I will choose something new) in response to current research (There is a better way!).

Equitable Identification of Gifted Students



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