A Personal Journey to Equitable Assessment of Intelligence: Measure Thinking not Knowing

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1

Disclosures of Tests & Books I have Published related to Equity (1985 – 2022)

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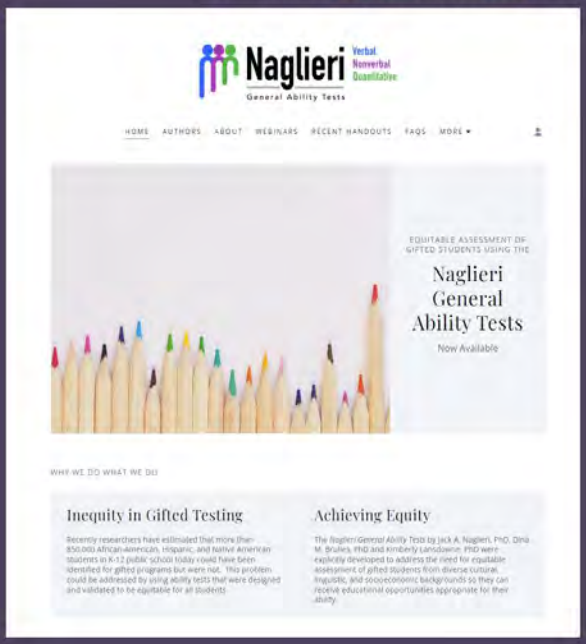
2

2

FOR MORE INFORMATION PLEASE GO TO MY WEB PAGES



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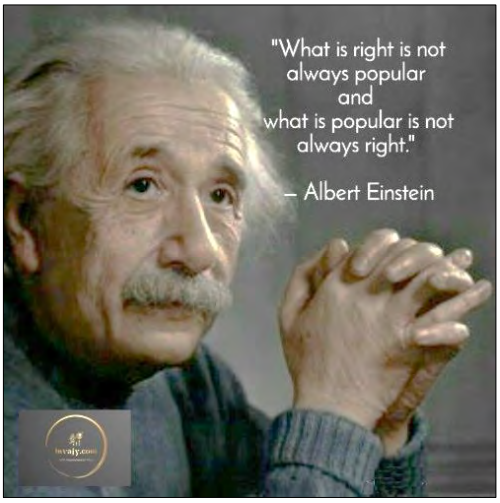
The BIG picture

- The comprehensive assessments we provide change the course of a student's life
- The intelligence test we choose has a profound influence on what we learn and say about the student
- Equitable assessment can be achieved if we choose tests that measure how well a student **THINKS** in a way that is not confounded by what a student **KNOWS**



4

4

Topics for Today

My Equity Journey

Historical Context

The American Psychological Association Apology

How to Improve Intelligence Tests

Closing remarks

5

Introduction

- My interest in how people learn began when I taught guitar.

1967

Undergrad (1968-1972)

- C. W. Post of Long Island Univ.
  - Behavior Modification
  - Neuropsych class
  - Psychoanalytic perspective
  - Tests & Measurement

School Psych Degree (1975)

Saint John's University

- John Carboy – Neuropsychology of Learning Disabilities & A. R. Luria
- Rita Dunn – Modality based conceptualization of learning

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7

Traditional IQ and Achievement Tests

- 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 clearly measured achievement

8

8

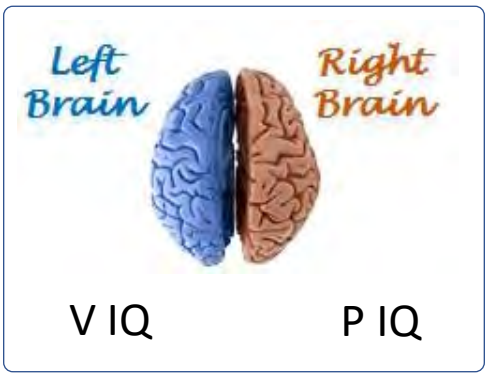
University of Georgia 1977-1979

- Alan and Nadeen Kaufman
- Opportunity to create
- My interest in intelligence test development

2022 UGA Lifetime Achievement Alumni Award

Assistant Professor at Northern Arizona Univ.

- Teaching intellectual assessments in the school psychology program at Northern Arizona University 1979
- Lecture about genetic attributes of Native Americans' intelligence
- An absurd position



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

11

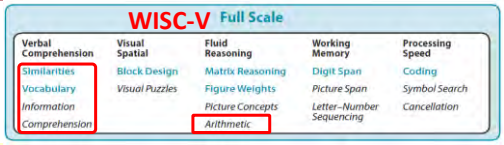
11

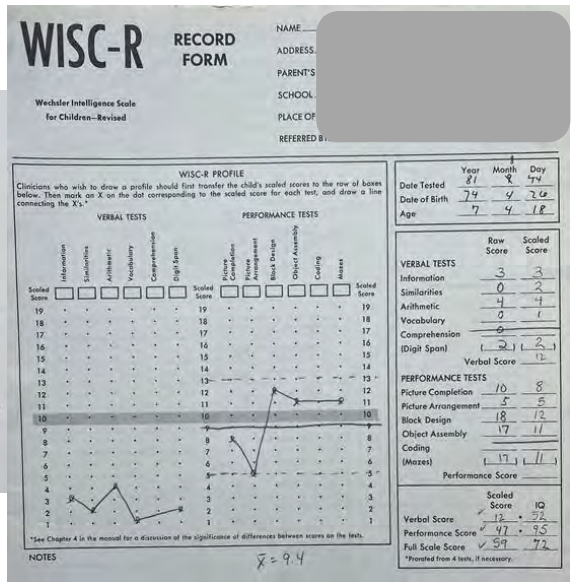
1981

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.



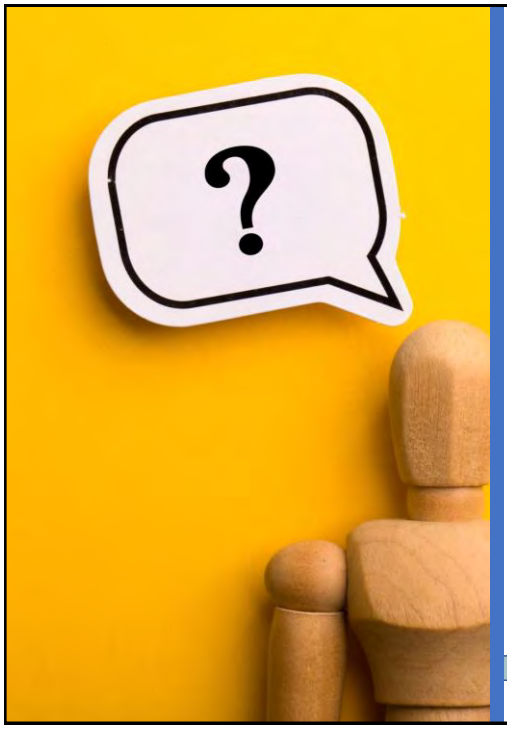


Naglieri, J. A. (1982). Does the WISC-R measure verbal intelligence for non-English speaking children? ***Psychology in the Schools, 19*****, 478-479.**

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

12

12



Equitable Assessment of Intelligence

- The questions I had about WISC subtests made me critical of the way intelligence is measured
- Solution?
- Measure how well a person solves problems by **THINKING** in a way that is not dependent upon **KNOWING**
- How can you measure THINKING?
- I started with a progressive matrices test

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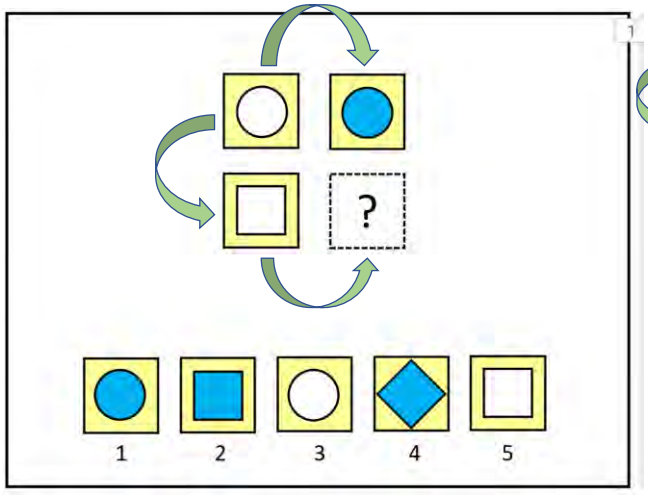
13

Tests that Measure Thinking or Knowing?



Girl is woman as boy is to ____?

3 is to 6 as 4 is to ____?

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

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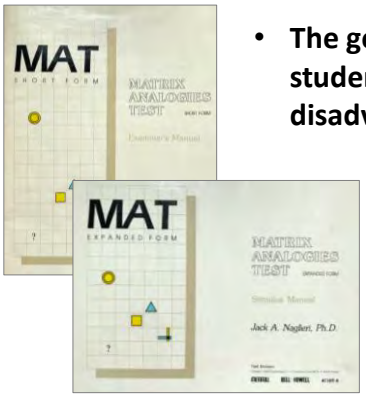
14

14

Naglieri's Nonverbal Tests: 1985 to Present

- **First and Second Versions**



MAT Short and Expanded Forms 1985

- **The goal: equitable measurement of *general ability* for ALL students, especially "intellectually gifted children from disadvantaged backgrounds** (Naglieri, 1985, p. 3)."

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

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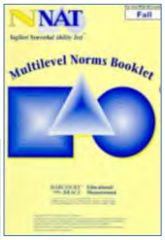
15

Naglieri's Nonverbal Tests : 1985 to Present

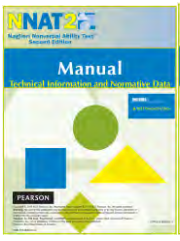
- **Sixth Version of the Naglieri Nonverbal Tests**

MAT Short and Expanded Forms 1985

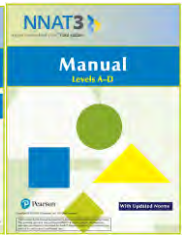


Naglieri Nonverbal Ability Test 1997

NNAT –Individual, 2003



NNAT -2 2008



NNAT3 2016

The NNAT3 Validity:
- No difference between online & paper
- The NAI scores correlated with the **OLSAT 8 suggesting that the two tests measure general ability**.

The research on all these tests convinced me that measuring intelligence using items that measured how well students **think** in a way that is not influenced by what they **know** was an equitable way to measure general intelligence 'g'.

16

Tests with Equity as a Goal 1985-Present

Traditional Tests

1. Naglieri, J. A. (1985). Matrix *Analogies Test - Expanded Form*. San Antonio: The Psychological Corporation.
2. Naglieri, J. A. (1985). Matrix *Analogies Test - Short Form*. San Antonio: The Psychological Corporation.
3. Naglieri, J. A. (1997). Naglieri *Nonverbal Ability Test.* San Antonio, TX: The Psychological Corporation.
4. Naglieri, J. A., & Bardos, A. N. (1997). General *Ability Scale for Adults.* San Antonio, TX: Pearson.
5. Naglieri, J. A. (2003). Naglieri *Nonverbal Ability Test - Individual Form.* San Antonio, TX: Pearson.
6. Wechsler, D., & Naglieri, J. A. (2006). *Wechsler Nonverbal Scale of Ability*. San Antonio, TX: Pearson.
7. Naglieri, J. A. (2008). *Naglieri Nonverbal Ability Test – 2nd Edition.* San Antonio, TX: Pearson.
8. Naglieri, J. A. (2016). *Naglieri Nonverbal Ability Test – Third Edition*. San Antonio, TX: Pearson.

Second Generation

9. Naglieri, J. A., & Das, J. P. (1997). Cognitive *Assessment System. Austin: ProEd*
10. Naglieri, J. A., Das, J. P., Goldstein, S. (2014). *Cognitive Assessment System Second Edition*. Austin, ProEd.
11. Naglieri, J. A., Das, J. P., & Goldstein, S. (2014). *Cognitive Assessment System Second Edition - Brief*. Austin, ProEd.
12. Naglieri, J. A., Moreno, M. A., & Otero, T. M. (2017). *Cognitive Assessment System – Español*. Austin, ProEd.

13. Naglieri, J. A. (2022). *Naglieri General Ability Test: Nonverbal*. Markham, Canada: MHS.
14. Naglieri, J. A. & Brulles, D. (2022). *Naglieri Ability Test: Verbal*. Markham, Canada: MHS.
15. Naglieri, J. A. & Lansdowne, K. (2022). *Naglieri Ability Test: Quantitative*. Markham, Canada: MHS.

Keep in mind that nonverbal tests are fine to measure *general ability*; but school psychologists typically need to measure MORE than 'g'. I recommend a multi-dimensional theory of intelligence based on brain function (PASS).

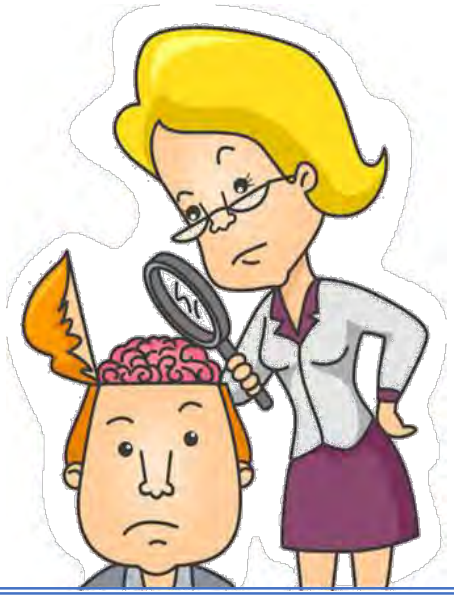
17

Two Questions:

1. Why do we measure ability the way we do?

2. Do the tests measure thinking or knowing?

The early history of IQ tests



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18

18

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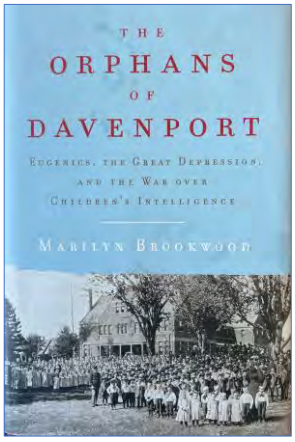
19

The Origin of IQ tests & Eugenics

- In the early 1900s (until the 1960s) low IQ scores were described as Morons (50-79), Imbeciles (20-49) and Idiots (below 20).
- During this time the "science" of eugenics was widely accepted, and the consequences of low IQ scores severe
  - institutionalized
  - forced sterilization of women



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20

Lewis Terman 1916 Stanford-Binet

- 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)

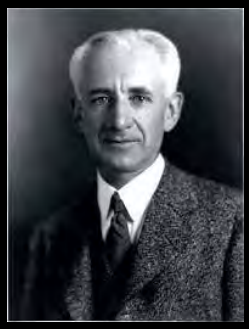
- His aim was identification of low intelligence children and adults who would be involuntarily institutionalized and sterilized for the improvement of society

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

21

21

Robert Yerkes – Army Mental Tests 1920



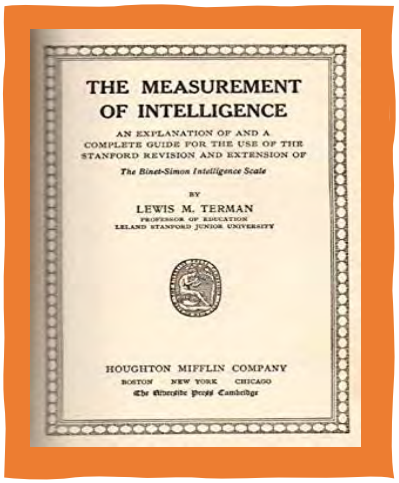
- Robert Yerkes, of Harvard University was president of the *American Psychological Association*
- and leader of the *Eugenics Section of the American Breeders' Association's Committee on the Inheritance of Mental Traits*
- which advocated institutional segregation and sterilization for persons with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

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

22

22

The intelligence test being used at that time was…the Stanford-Binet (Terman, 1916)


THE MEASUREMENT OF INTELLIGENCE

AN EXPLANATION OF AND A COMPLETE GUIDE FOR THE USE OF THE STANFORD REVISION AND EXTENSION OF *The Binet-Simon Intelligence Scale*

BY

LEWIS M. TERMAN

PROFESSOR OF EDUCATION
LELAND STANFORD JUNIOR UNIVERSITY

HOUGHTON MIFFLIN COMPANY

BOSTON NEW YORK CHICAGO

The Riverside Press Cambridge

23

Florence Goodenough 1926

Stanford-Binet "IQ by Racial Stock"

RACIAL DIFFERENCES IN THE INTELLIGENCE OF SCHOOL CHILDREN

BY FLORENCE L. GOODENOUGH

Institute of Child Welfare, University of Minnesota

94

TABLE II

DISTRIBUTION OF INTELLIGENCE QUOTIENTS BY RACIAL STOCK

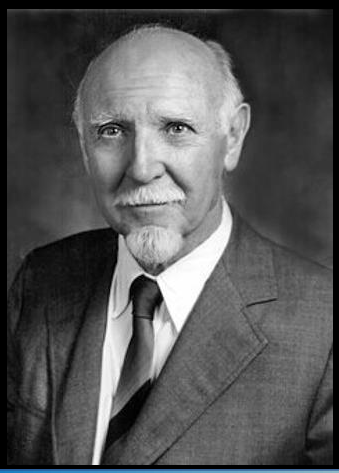
IQ	American	Armenian	Italian	Spanish-Mexican	California Negroes	Southern Negroes	Hoopa Valley Indians	Jewish	Chinese	Japanese	Germans	Portuguese	English and Scotch	French and Swiss	Danish, Swedish and Norwegian	Assyrian, Slavonian and Serbian
Total cases	500	123	456	367	69	613	79	55	25	42	29	11	14	14	31	29
Mdn.....	100.3	91.8	87.5	87.2	82.7	76.5	85.6	06.3	103.1	99.5	98.8	93.3	99.5	92.8	104.5	94.5
Mean.....	101.5	92.3	89.1	88.5	85.8	78.7	85.6	06.1	104.1	101.9	101.1	94.5	100.2	94.5	103.5	92.8
S.D.....	18.3	15.6	16.0	17.5	18.7	17.5	14.1	16.2	18.0	18.0	19.3	16.5	16.8	19.6	17.8	18.8
Coeff. of var.....	18.0	16.9	18.0	19.8	21.8	22.2	16.5	15.3	17.2	17.7	19.1	17.5	16.8	20.7	17.2	20.3

FIA

24

24

Raymond Cattell - 1933



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

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

25

25

IQ Tests Defined Intelligence

Edwin Boring: The Stanford-Binet became the *operational definition of intelligence*

Edith Spaulding & William Healy

INHERITANCE AS A FACTOR IN CRIMINALITY.

A STUDY OF A THOUSAND CASES OF YOUNG REPEATED OFFENDERS.[1]

EDITH R. SPAULDING[2] AND WILLIAM HEALY.[3]

Inheritance as a factor in criminality may be considered under two heads: (a) the direct inheritance of criminalistic traits in otherwise normal individuals; (b) the indirect inheritance of criminalistic tendencies through such heritable factors as epilepsy, insanity, feeble-mindedness, etc. The first should include only those cases in which the traits themselves are primarily criminalistic, while the second comprises those in which certain inherited qualities of body or mind, not anti-social in themselves, produce criminals when ill proportioned to other characteristics in the same individual, or ill adjusted to environment. Thus a feeble-minded individual may show no delinquent tendencies if sufficiently protected, but placed on his own resources in society, he soon finds his way to the police court.

In the thousand cases which have been reviewed, we have carefully sought for evidence of direct inheritance of criminalistic traits, as such. However, in no one case of the thousand have we been able to discover evidence of anti-social tendencies in succeeding generations without also finding underlying trouble of a physical or mental nature, or such striking environmental faults or mal-adjustments as often develop delinquency in the absence of defective inheritance. In order to prove the existence of the first class, we feel it absolutely essential to rule out other well-known causative factors in each case.[1]

Family charts alone, without detailed environmental and developmental history, are not sufficient proof of inherited criminalism, no matter how many criminal histories they may contain. Studying the history of criminalistic tendencies, which themselves may arise through any of a large number of possible biologic, mental or social factors, is

[1]Read before the American Academy of Medicine at its thirty-eighth annual meeting, Minneapolis, June 14, 1913. Published here and in the Bulletin of the American Academy of Medicine simultaneously, by courtesy of the Bulletin.

The claim that we have measured hereditary intelligence has no scientific foundation

We cannot measure intelligence *when we have never defined it.*

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26

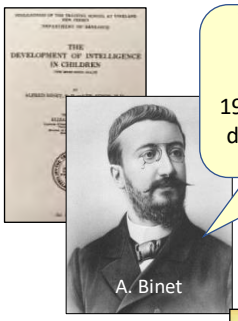
26

Was the 1916 Stanford-Binet different from the test Binet presented in 1911?

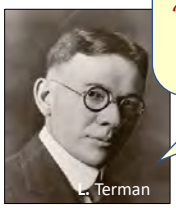
YES…and that created an equity problem

27

Stanford-Binet → Army Mental Tests → Today

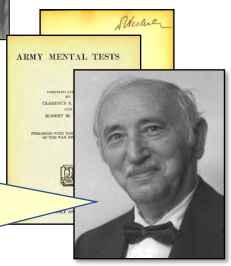


When working on the 1911 scale, Binet removed items from 1908 scale because 'they depended too much on school learning'



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'.

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



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

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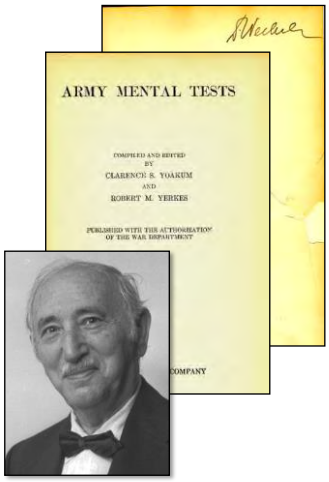
28

28

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, WJ CogAT & Otis-Lennon

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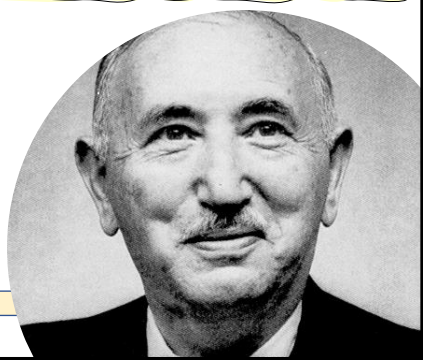
29

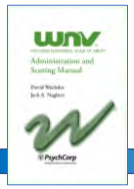
29

Wechsler's View of General ability

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

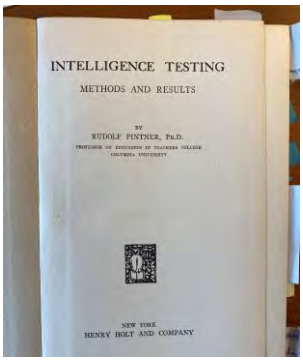
"The aggregate or global capacity of the individual to act purposefully, to think rationally, and to deal effectively with his environment (1939)"





30

General Ability Definition


INTELLIGENCE TESTING

METHODS AND RESULTS

BY

RUDOLF PINTNER, Ph.D.

NEW YORK
HENRY HOLT AND COMPANY

- "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)".

31

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

Pintner

(Intelligence Testing, 1923)

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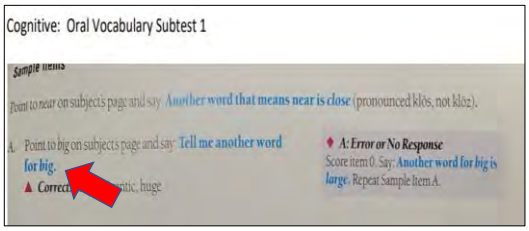
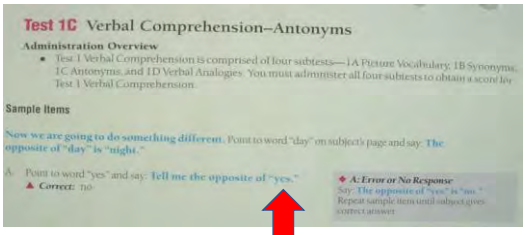
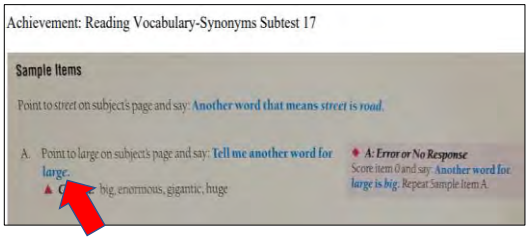
32

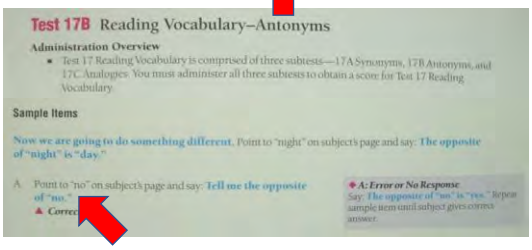
32

Very Similar Items on "Different" WJ Tests









33

Including *Knowledge* in "Ability" Tests & Equity

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**

34

Is my observation consistent with yours?

Does Thinking vs Knowing make sense?

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35

35

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

— Maya Angelou —

36

36

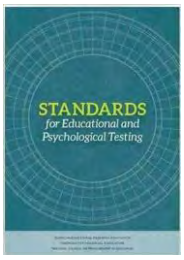
What information do we need?

Research on test bias and test equity to determine test fairness

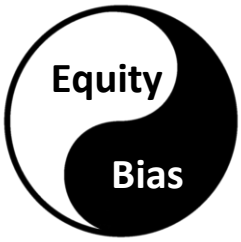
37

Test Bias, Test Equity and Test Content

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



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



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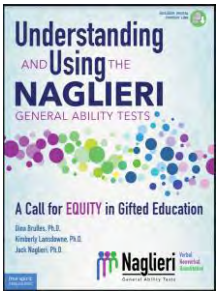
38

38

Race and Ethnic Average Score Differences by Ability Test



Traditional tests that include knowledge and *2nd-Generation* Ability Tests that minimize knowing

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.

	By Race	By Ethnicity
Tests that require knowledge	**Mn = 9.5**	**Mn = 5.2**
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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**
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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).

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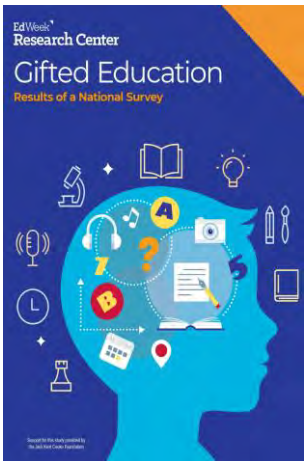
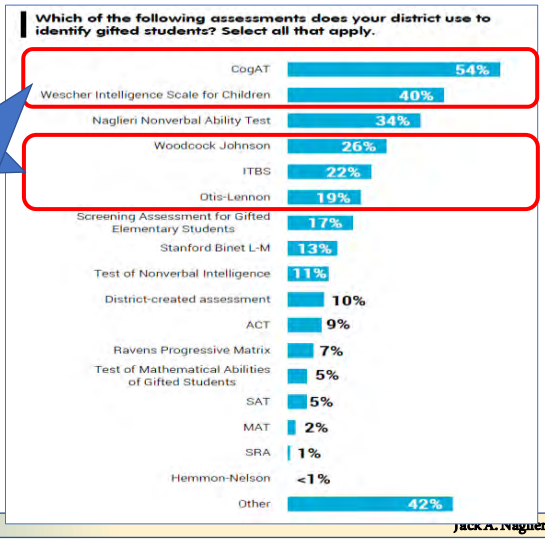
39

National Survey of Gifted Education



These tests have verbal and quantitative questions and lengthy verbal directions



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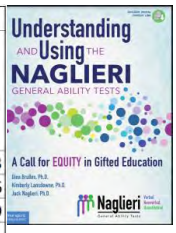
40

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 +

https://nces.ed.gov/programs/digest/d17/tables/dt17_203.60.asp
https://nces.ed.gov/programs/digest/d17/tables/dt17_204.80.asp

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**

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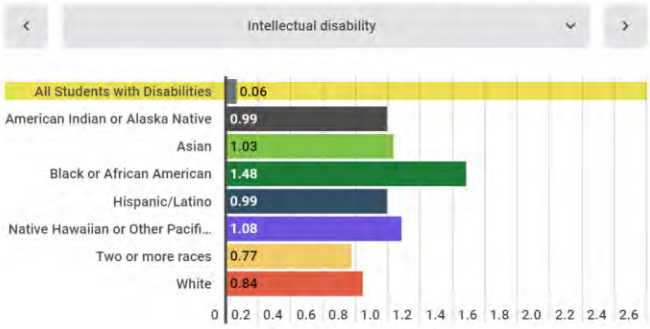
41

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

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

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

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



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

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

42

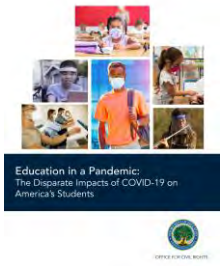
42

Learning Loss During Covid and Intelligence Test Scores

- The *average* public-school student in grades 3-8 lost a half year of learning in math and a quarter in reading.
- Schools with highest percentage of students receiving federal lunch subsides missed two thirds (66%) of a year of math learning,
- Schools with the fewest low-income students lost *10%* of a year.
- Intelligence tests that demand knowledge are IMPACTED BY the academic learning loss
- **All traditional intelligence tests with pre-covid norms are impacted!**

educationrecoveryscorecard.org/2022/10/28/

EDUCATION RECOVERY SCORECARD



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

43

Topics for Today

My Equity Journey

Historical Context

The American Psychological Association Apology

How to Improve Intelligence Tests

Closing remarks

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44

American Psychological Association Apology

- 'APA recognizes the roles of psychology in promoting:
- racism
- and the harms that have been inflicted on communities of color
- And the ways measurement of intelligence has been systemically used to create the ideology of White supremacy (p. 2)'

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45

What is the Practical Impact?

Psychologists attributed IQ test differences to the people instead of the tests

46

Change Demands Courage to Think Differently

47

47

Topics for Today

- My Equity Journey
- Historical Context
- The American Psychological Association Apology
- **How to Improve Intelligence Tests**
- Closing remarks

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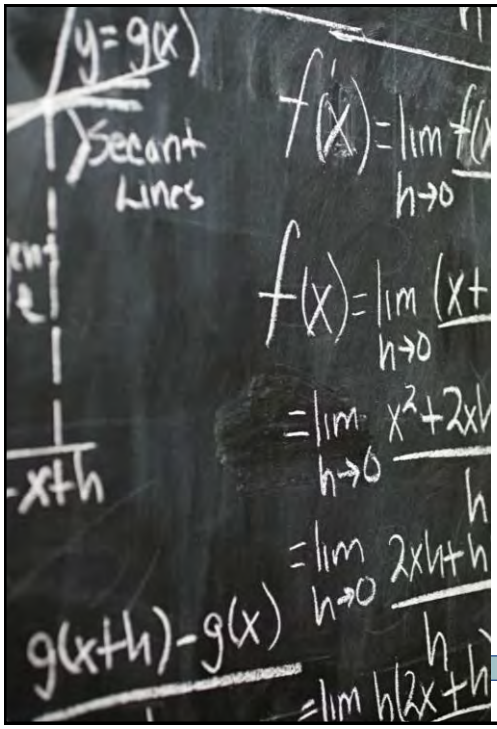
48

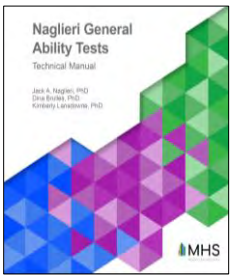


How Can we Test the Hypothesis that Knowledge Confounds the Measurement of General Intelligence?

Create Verbal, Nonverbal and Quantitative tests that measure general intelligence that do not rely on knowledge and DO THE EQUITY RESEARCH!

The Naglieri General Ability Tests: Verbal, Nonverbal and Quantitative

Jack A. Naglieri, Ph.D. jnaglieri@gmail.com
Dina Brulles, Ph.D. dbrulles@gmail.com
Kim Lansdowne, Ph.D. kimberly.Lansdowne@asu.edu

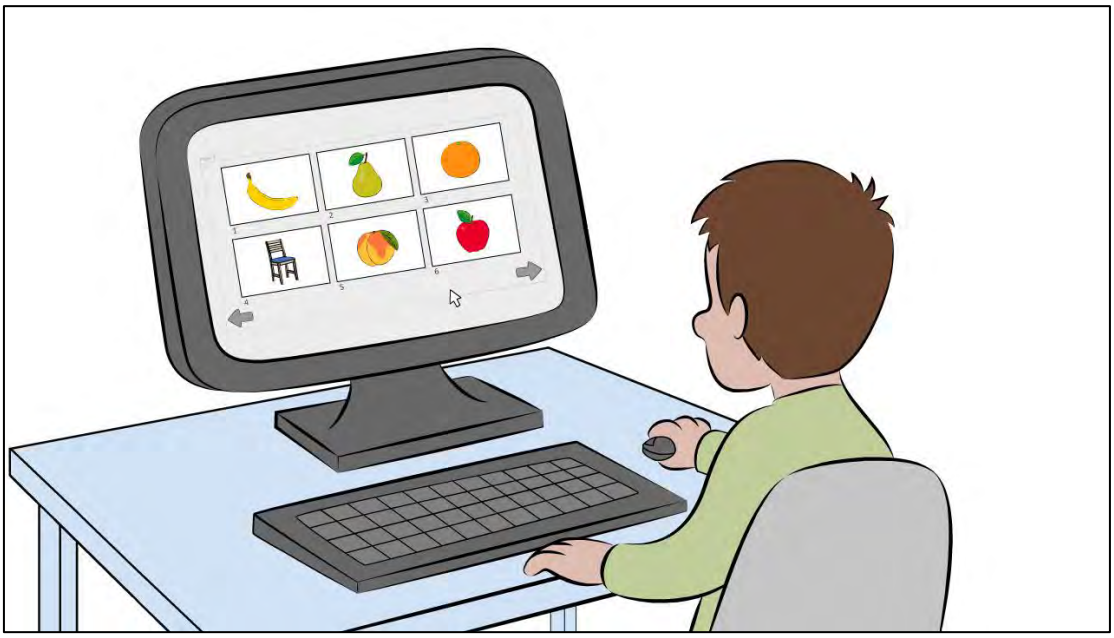


Naglieri General Ability Tests

Naglieri Verbal Nonverbal Quantitative
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** using:
  - 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 and national norms

51



52

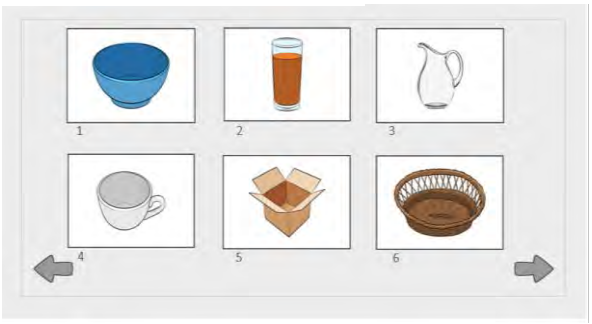
Naglieri General Ability Test – Verbal
(Naglieri & Brulles)

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 Tests | Verbal



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53

53

Naglieri General Ability Test – Quantitative
(Naglieri & Lansdowne)

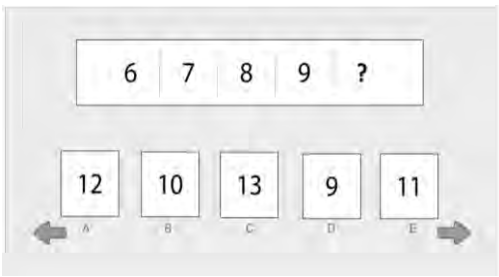
The Naglieri–Q **measures general ability** using numbers and/or symbols. Students must decipher the logic behind *the relationships among the numbers and symbols* to identify the answer.

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.

Naglieri General Ability Tests | Quantitative



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54

54

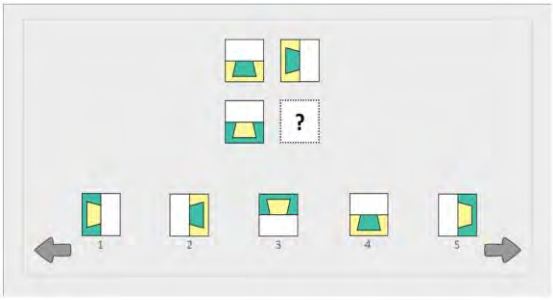
Naglieri General Ability Test - Nonverbal

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



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55

55

Research Evidence of Equity

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

NONVERBAL TEST

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

VERBAL TEST

- N= 2,482 Sample closely matches the US population on key demographics
- **No GENDER differences** found between **males** and **females** for raw score across all forms
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QUANTITATIVE TEST

- N= 2,841 Sample closely matches the US population on key demographics
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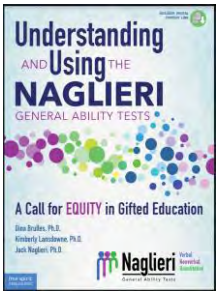
56

56

Race and Ethnic Differences by Ability Tes



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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).

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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.

To understand learning differences, we need to measure MORE than 'g'. PASS theory as measured by the CAS2 provides a way to measure four distinct neurocognitive abilities to measure 'Thinking' with minimal demands of 'Knowing".

57

57

What is the Practical Impact?

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

58

Change Demands Courage to Think Differently

Socially just identification of all students requires self-reflection and self-correction in response to current research

59

59

Topics for Today

- My Equity Journey
- Historical Context
- The American Psychological Association Apology
- **How to Improve Intelligence Tests**
- Closing remarks

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60

Tests of 'g' and Modern Tests of Intelligence

Tests of General Ability 'g'

- Naglieri General Ability Tests: Verbal, Nonverbal and Quantitative
- Naglieri Nonverbal Ability Test
- Unit (Bracken & McCallum)
- Wechsler nonverbal
- Stanford-Binet
- WISC-V
- WJ

- **Tests of Multiple Abilities**
- Kaufman-Assessment Battery for Children 1st and 2nd Editions based on multiple concepts of intelligence
- Cognitive Assessment System 1st and 2nd Editions based on PASS neurocognitive theory of intelligence

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61

Five Key Attributes of a Second-Generation Intelligence Test

1. Start with a THEORY of intelligence based on the BRAIN
2. Ensure that the test questions measure THINKING
3. Ensure that KNOWING is minimized
4. Test the TEST – Do not advocate in advance of the science
5. Provide research to demonstrate that the test is equitable, interpretable beyond the total score, yields profiles for strengths and weaknesses, and leads to intervention

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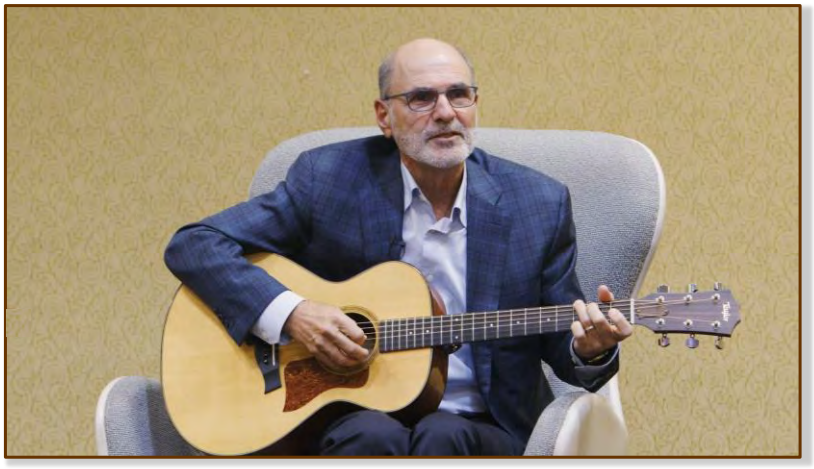
62

Maybe It's Time to Let the Old Ways Die



NYASP 2022
Legends in School
Psychology Award
Interview

63

WE CAN DO BETTER

We Must do Better

64

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65