Equitable Identification Can be Achieved: See How

With the

Naglieri General Ability Tests: Verbal, Nonverbal and Quantitative

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Naglieri Verbal Nonverbal Quantitative
General Ability Tests

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EQUITABLE ASSESSMENT OF GIFTED STUDENTS USING THE

Naglieri General Ability Tests

Now Available

WHY WE DO WHAT WE DO

Inequity in Gifted Testing

Recently researchers have estimated that more than 850,000 African-American, Hispanic, and Native American students in K-12 public school today could have been identified for gifted programs but were not. This problem could be addressed by using ability tests that were designed and validated to be equitable for all students.

Achieving Equity

The *Naglieri General Ability Tests* by Jack A. Naglieri, PhD, Dina M. Brulles, PhD and Kimberly Lansdowne, PhD were explicitly developed to address the need for equitable assessment of gifted students from diverse cultural, linguistic, and socioeconomic backgrounds so they can receive educational opportunities appropriate for their ability.

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TOOLS FOR PSYCHOLOGICAL AND EDUCATIONAL ASSESSMENT

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

NAGLIERI GENERAL ABILITY TESTS: VERBAL, NONVERBAL AND QUANTITATIVE

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

HANDOUTS

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

WEBINARS

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

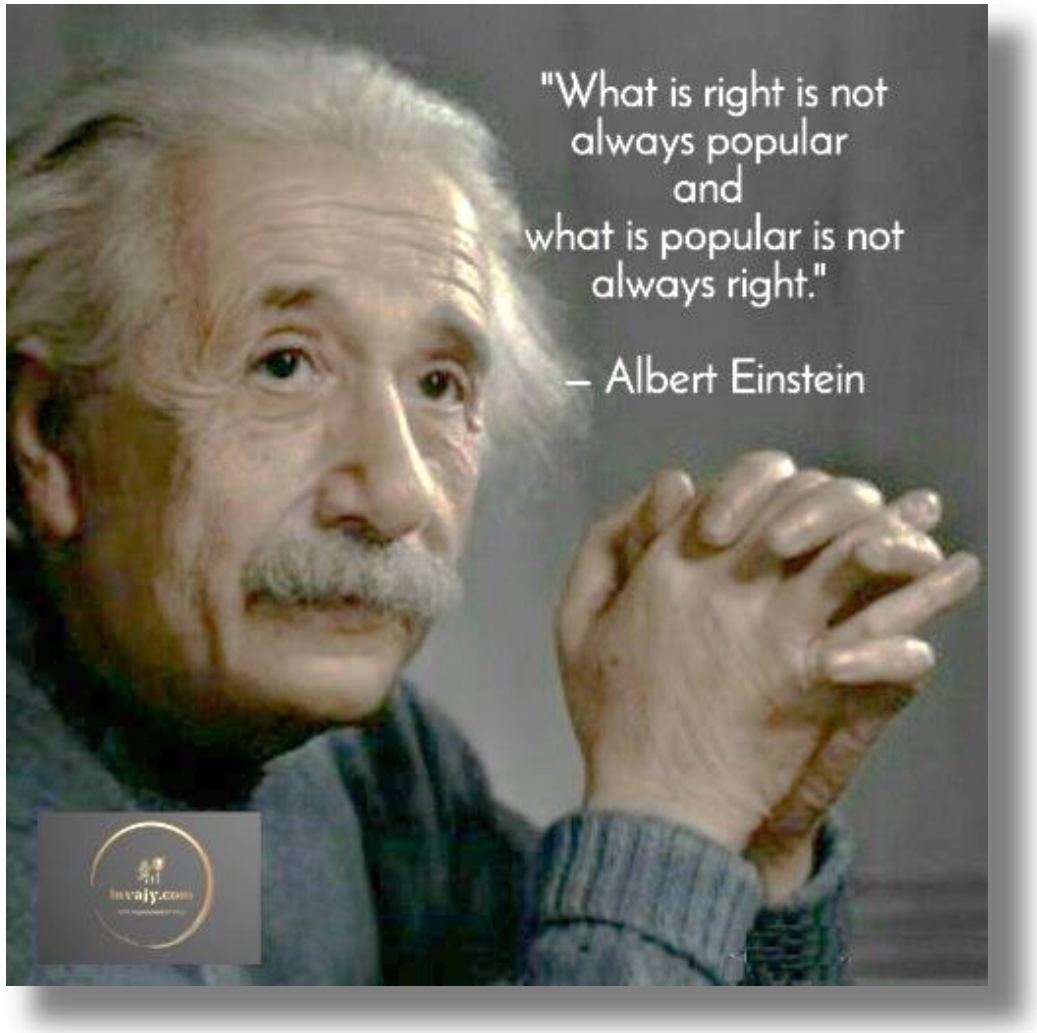
EQUITY

EXECUTIVE FUNCTION

HELPING CHILDREN LEARN

The BIG picture

- The tools we use to identify students for GIFTED PROGRAMS 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**



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 demand knowledge

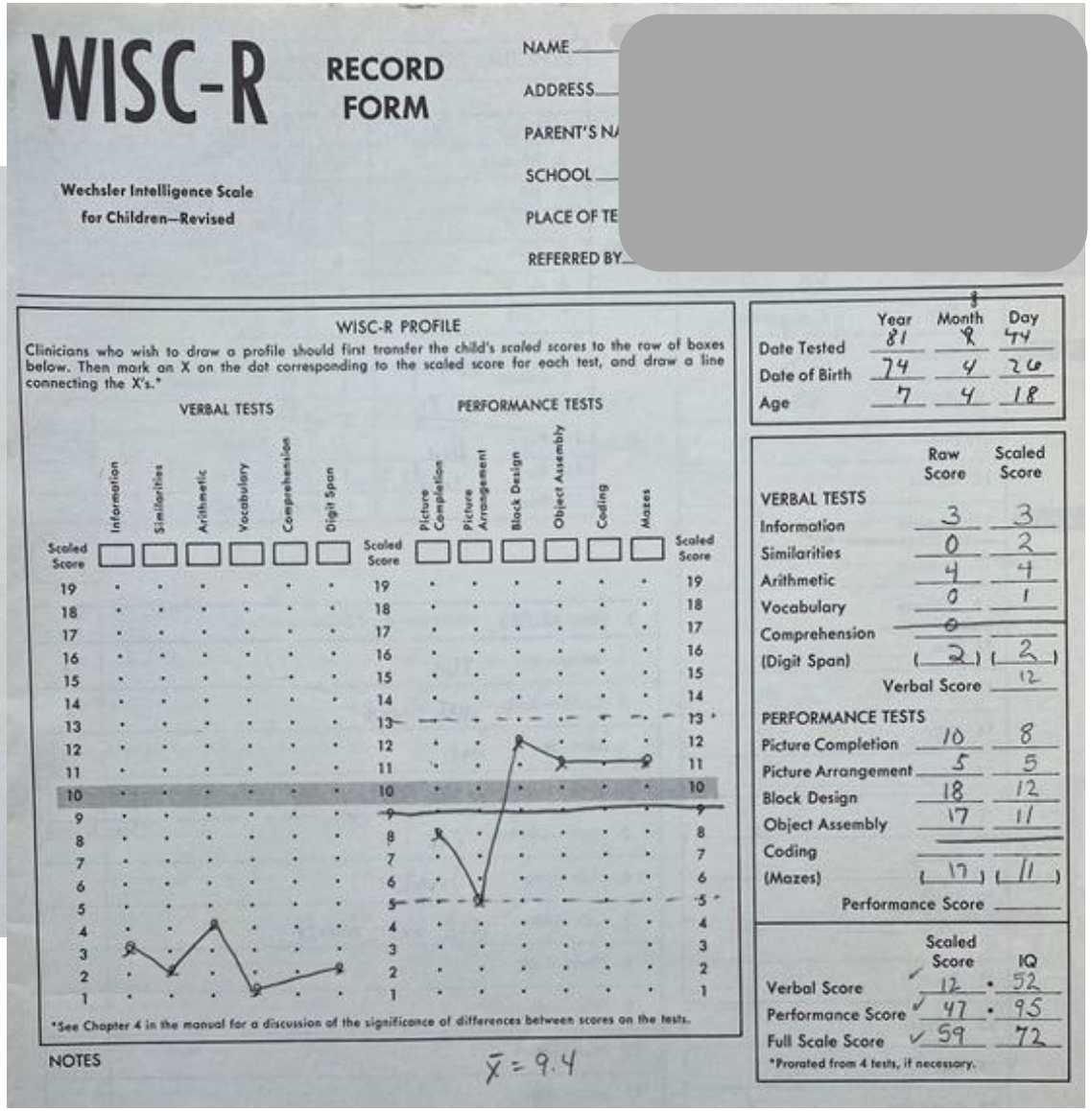
- Was it reasonable to measure ‘intelligence’ with questions that required knowledge?
- Testing in Havasupai answered that question

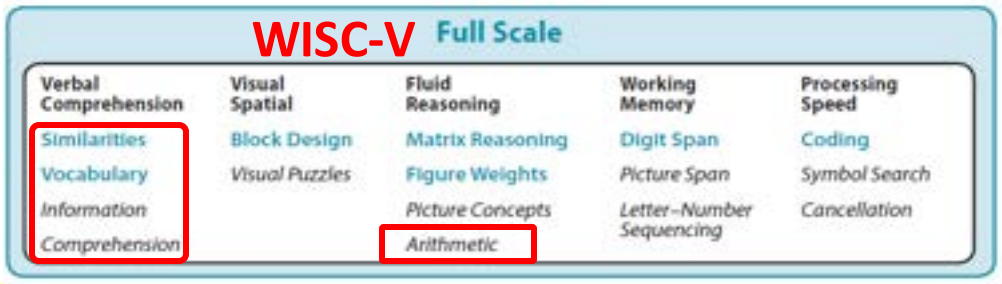
1981

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.





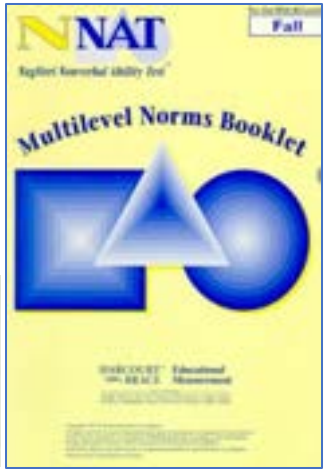
Naglieri, J. A. (1982). Does the WISC-R measure verbal intelligence for non-English speaking children? *Psychology in the Schools, 19*, 478-479.

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

Naglieri's Nonverbal Tests : 1985 to Present

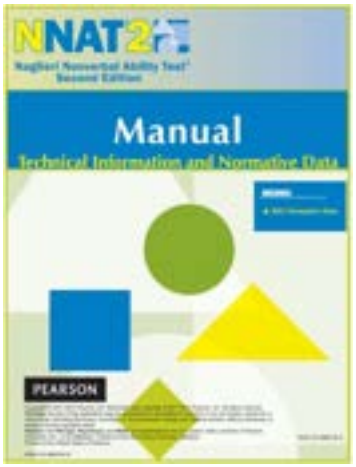
- **Six Versions of the Naglieri Nonverbal Tests**

MAT Short and Expanded Forms 1985



Naglieri Nonverbal Ability Test 1997

NNAT –Individual, 2003



NNAT-2 2008

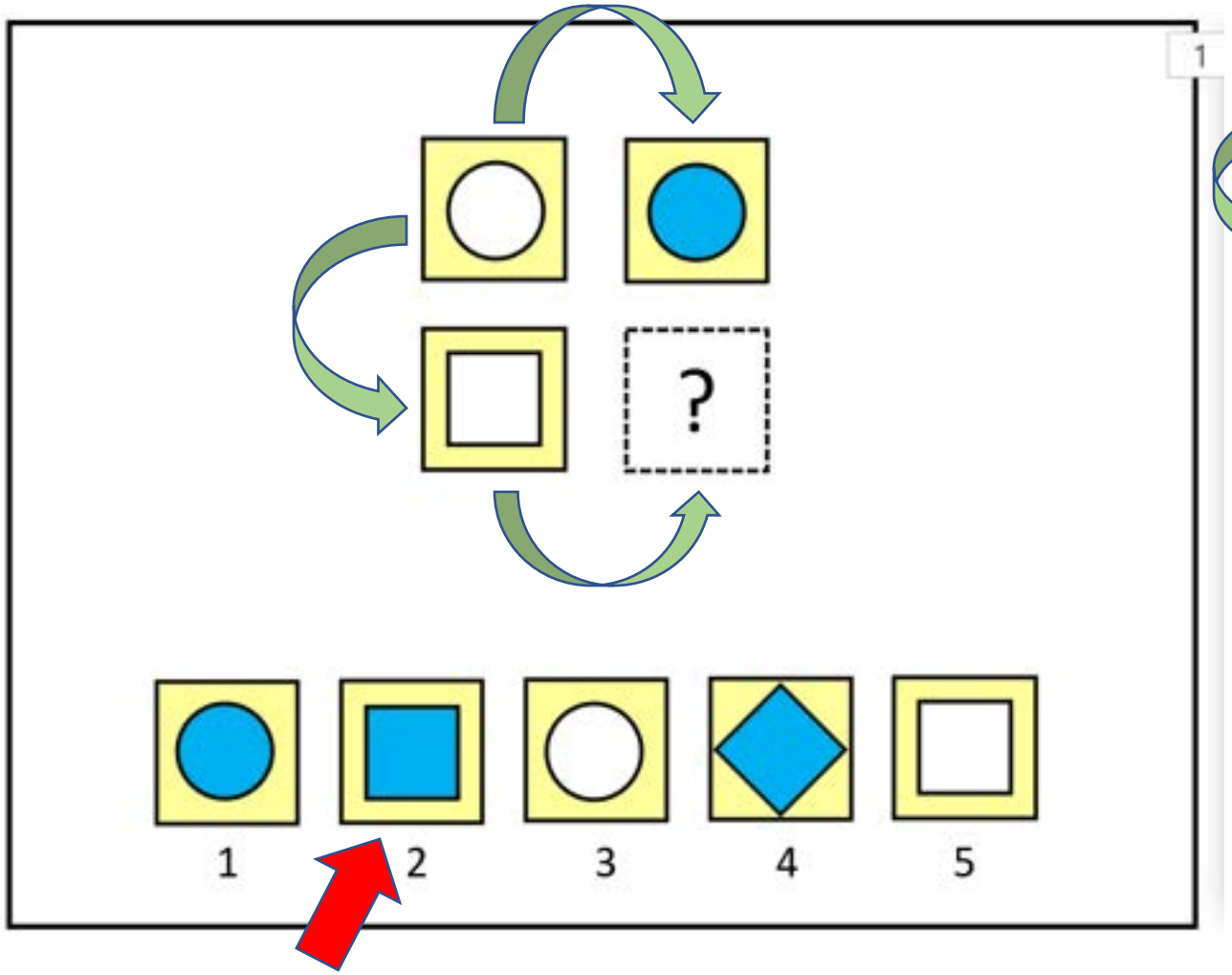
NNAT3 2016

NNAT Validity:

- **No difference by sex, race or Ethnicity (and Equal ID rates) on EVERY VERSION OF THE NNAT**
- The NAT scores **correlated significantly with Achievement & as well as the WISC!**

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'.**

Tests that Measure Thinking or Knowing?

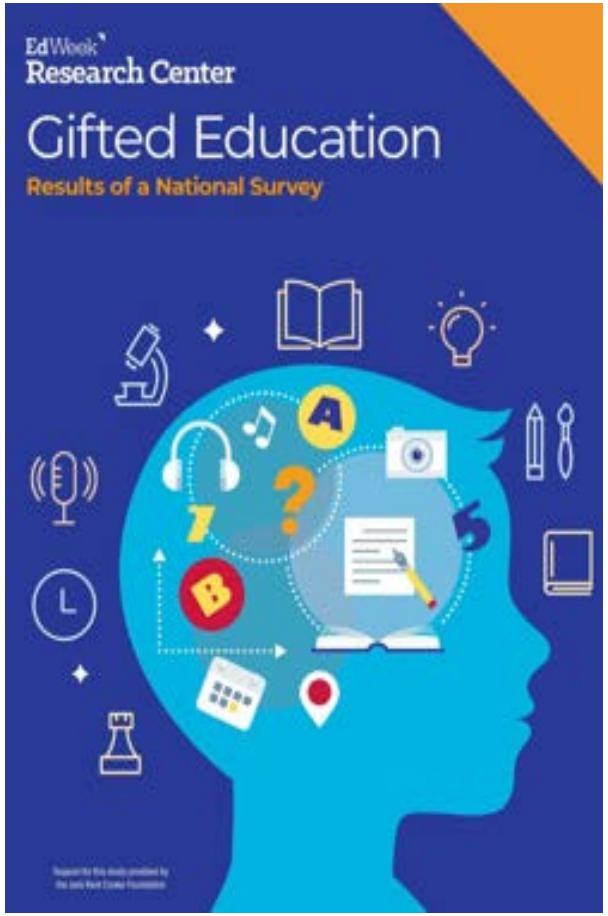


Girl is woman as
boy is to man ?

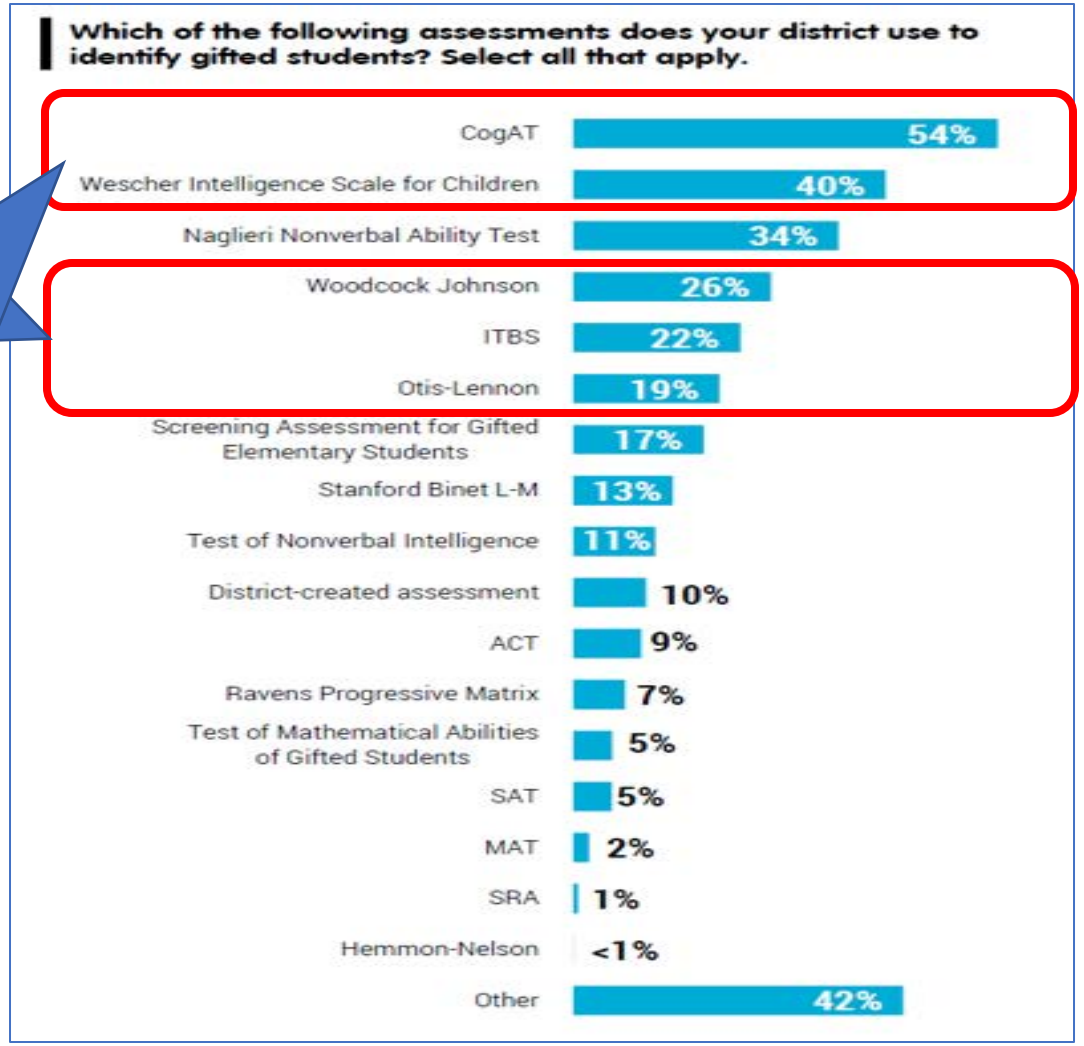
3 is to 9 as
5 is to 25 ?

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

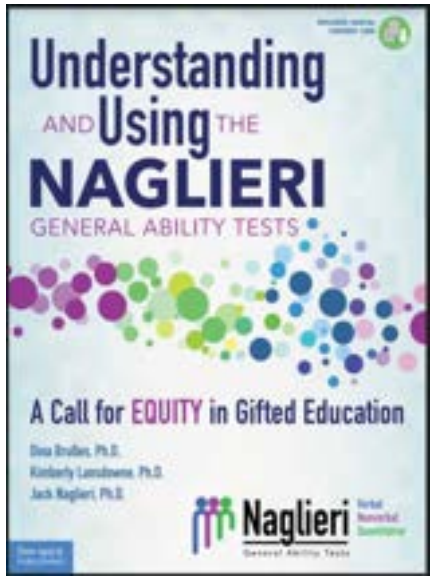
National Survey of Gifted Education



These tests have verbal and quantitative questions and lengthy verbal directions



Race and Ethnic Average Score Differences by Ability Test



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

	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
	2.2	1.6
	1.0	1.1
	3.2	1.3

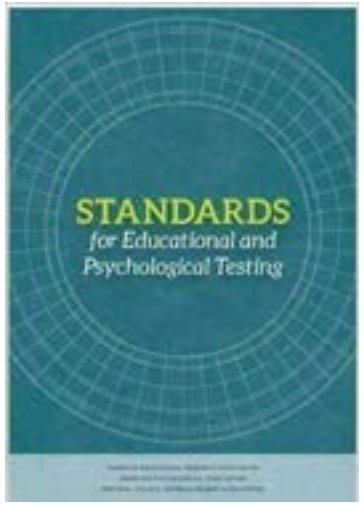
Note: The results summarized here were reported for the Otis-Lennon School Ability Test by Avant and O'Neal (1986); Stanford-Binet IV by Wasserman (2000); Woodcock-Johnson III race differences by Edwards and Oakland (2006) and ethnic differences by Sotelo-Dynega, Ortiz, Flanagan, and Chaplin (2013);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

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.

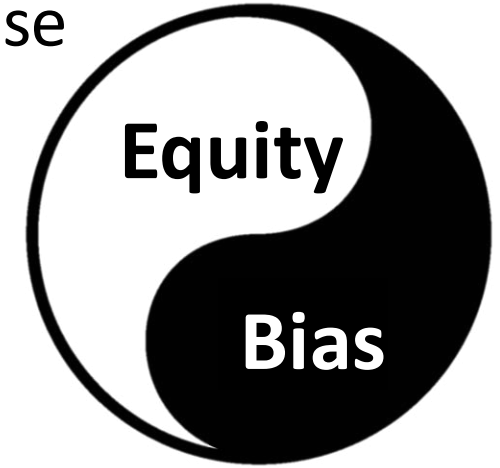
Note: Even though a test may not show psychometric bias those tests with academic content that show large mean score differences are not equitable and are unfair.

Test Content, Test Bias and Test Equity

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

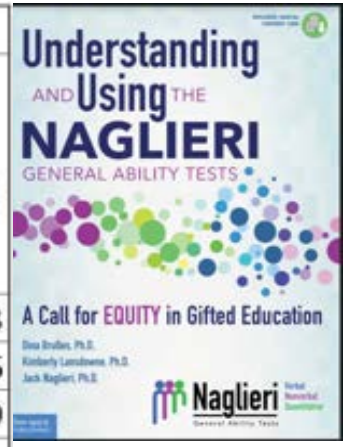


- … **if a person has had limited opportunities to learn the content in a test of intelligence, *that test may be considered unfair*** (because it penalizes students for not knowing the answers) **even if the norming data do not demonstrate test bias.**
- Evidence of EQUITY is examined by test content and mean score differences

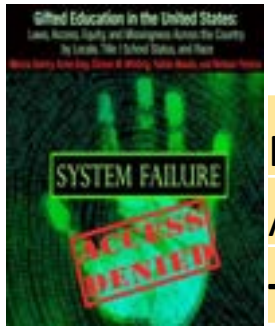


Numbers of Gifted Students Missed = 1,235,434

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

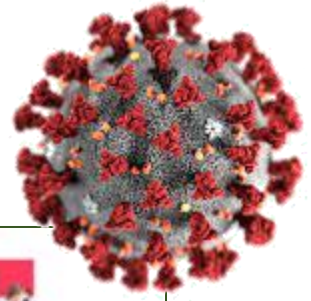


873,129 +

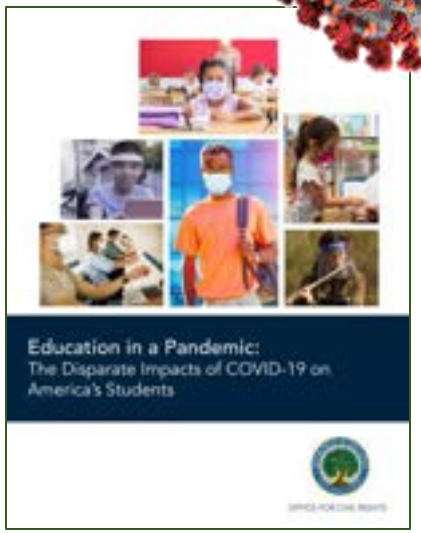


Percent of Schools that do not Identify	41.5%
Additional non-white gifted students = 41.5% of 873,129	N = 362,305
Total non-white gifted students missed	**N = 1,235,434**

Academic Learning Loss & COVID



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

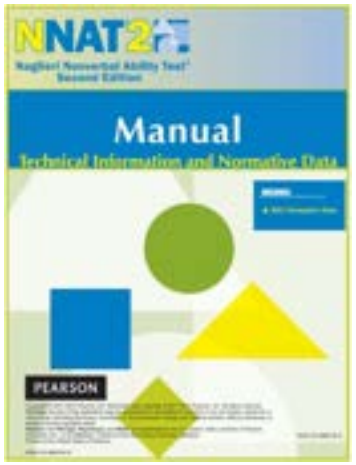


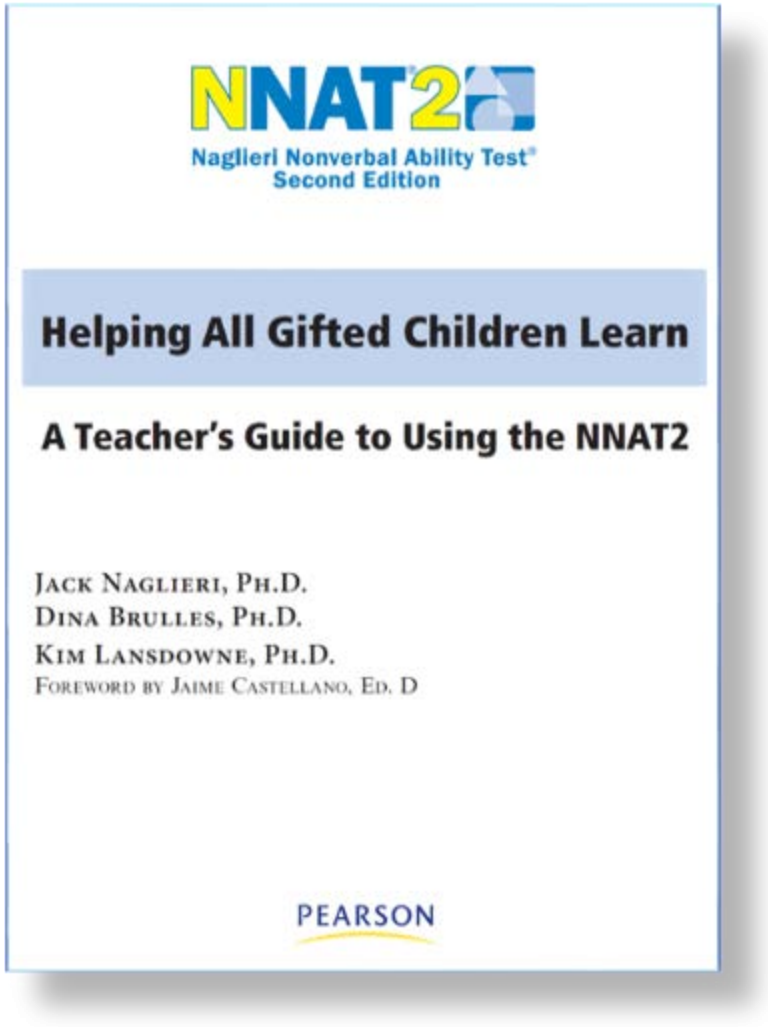
Education in a Pandemic: The Disparate Impacts of COVID-19 on America's Students. US Dept. of Ed- Office of Civil Rights. June, 21, 2021. https://www2.ed.gov/about/offices/list/ocr/docs/20210608-impacts-of-covid19.p

A Chance Meeting

- Naglieri, J. A. (2004). Reducing Under-representation of Minority Children in Gifted Education. SENG Conference, July 9-11, Arlington, VA.
- By 2008 we published our first book on Gifted Identification

2008





2008

2016 – 2022 Developmental Process

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** 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

The Naglieri General Ability Tests: Verbal, Nonverbal and Quantitative

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General Ability Tests

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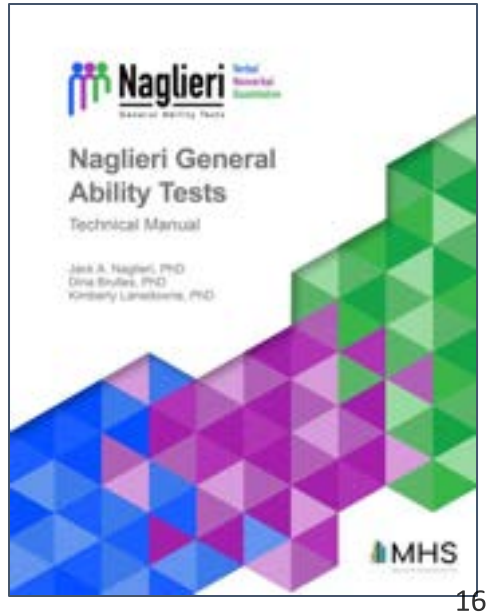

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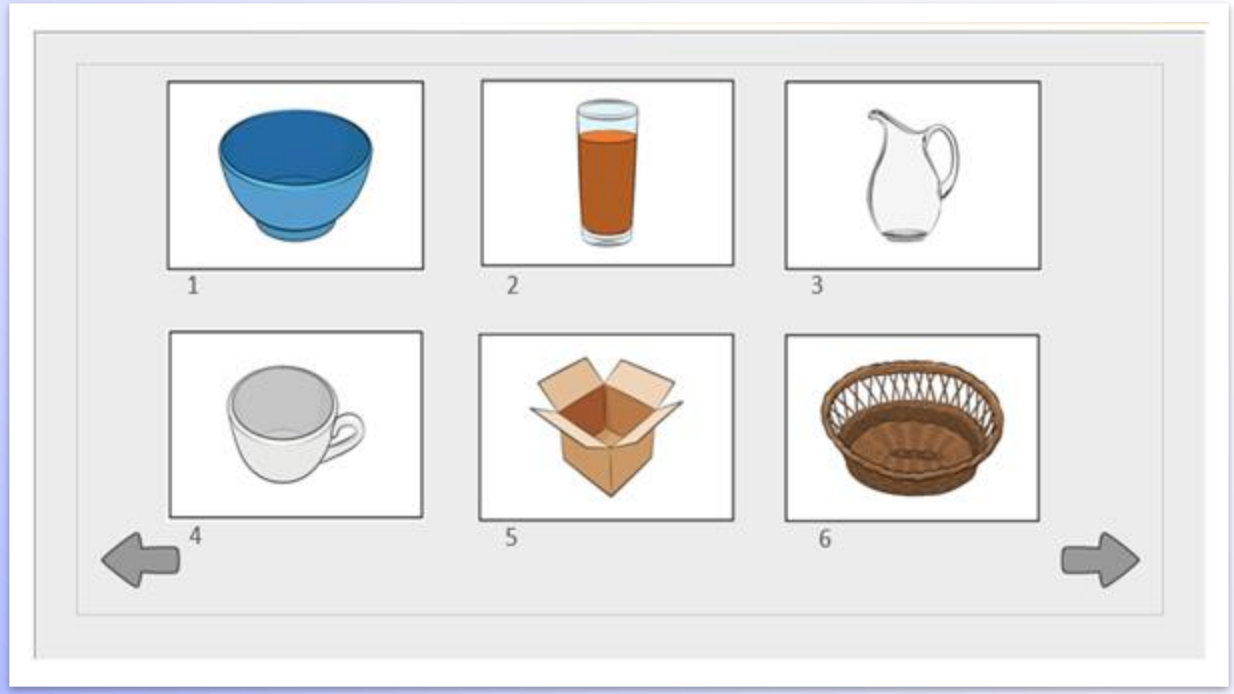
  - A multiple-choice response removes the need for verbal expression.
  - Online (and paper) administration for group or individual assessment
  - Universal assessment using local and national norms

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.

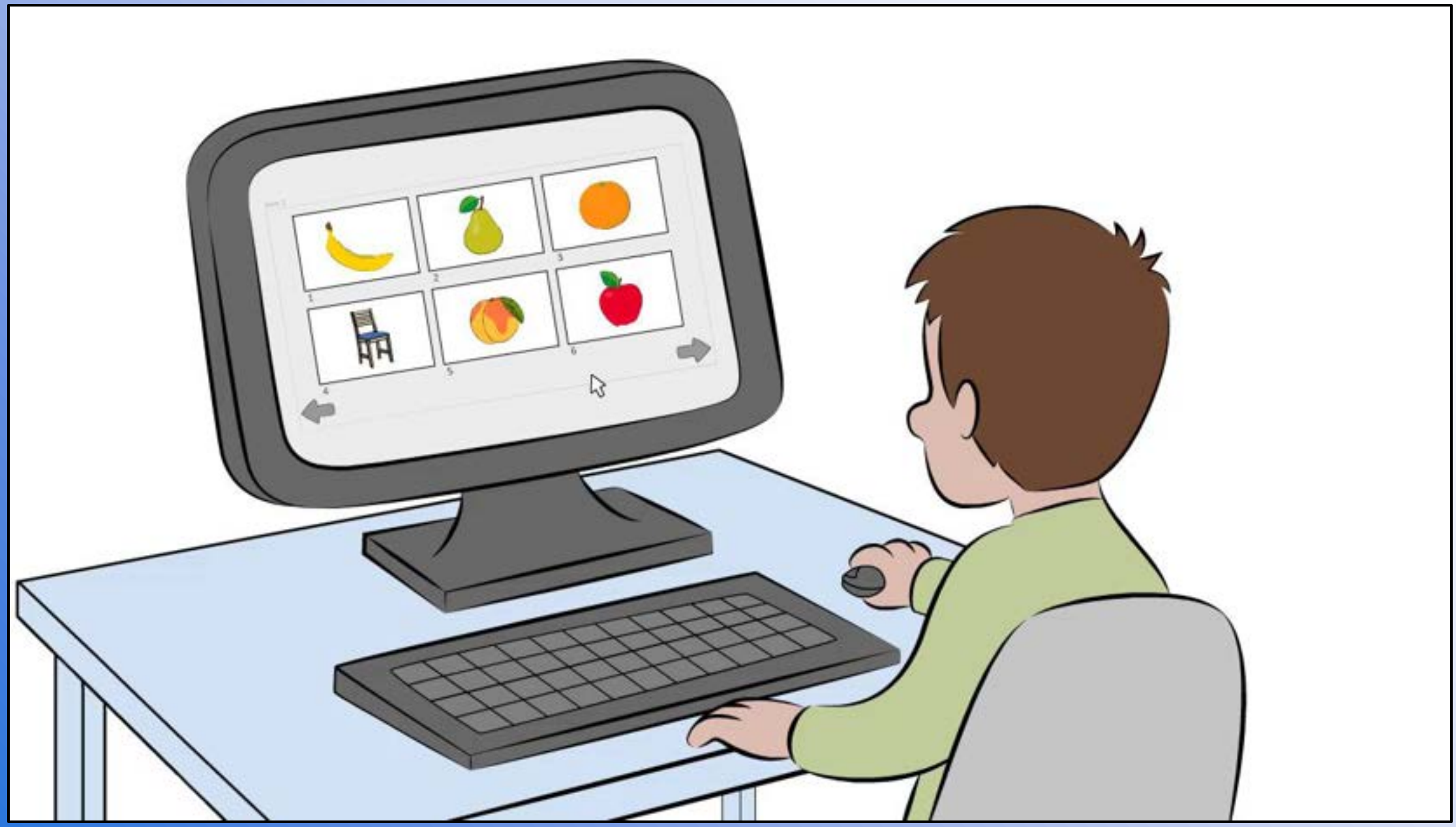
The student's task is to identify which of the six pictures does *not* represent the verbal concept shared by the other five.

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



Naglieri General Ability Tests | Verbal

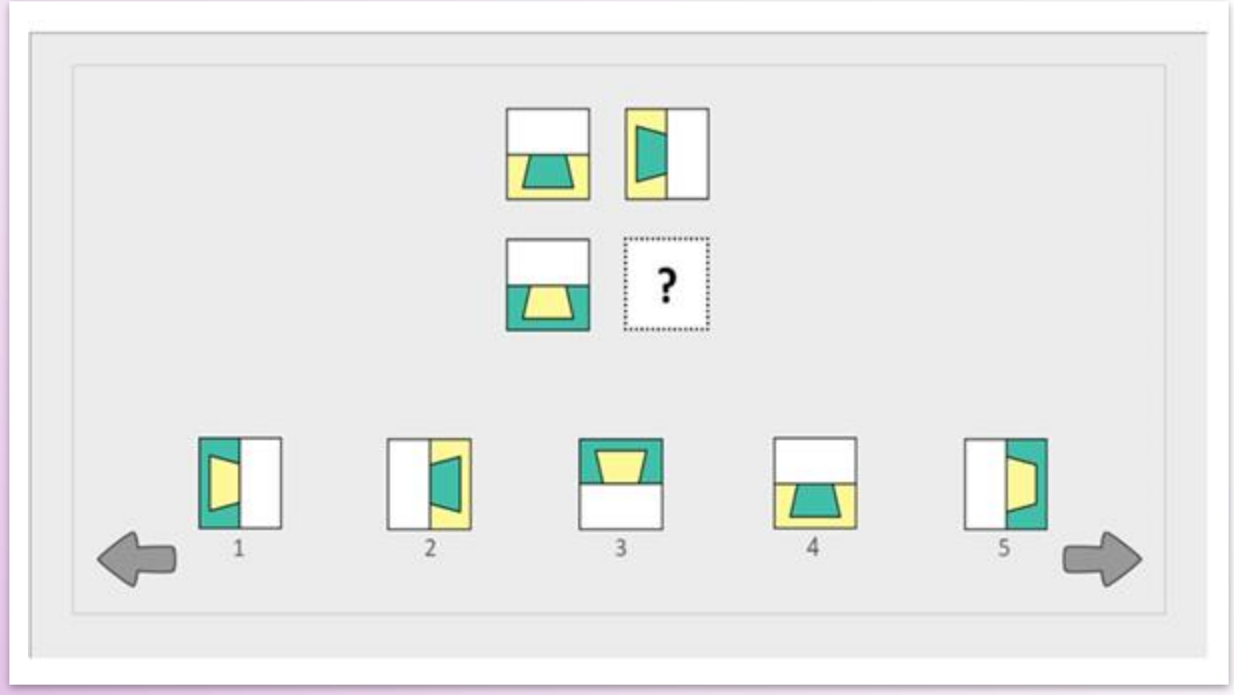
Naglieri General Ability Test – Verbal (Naglieri & Brulles)



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

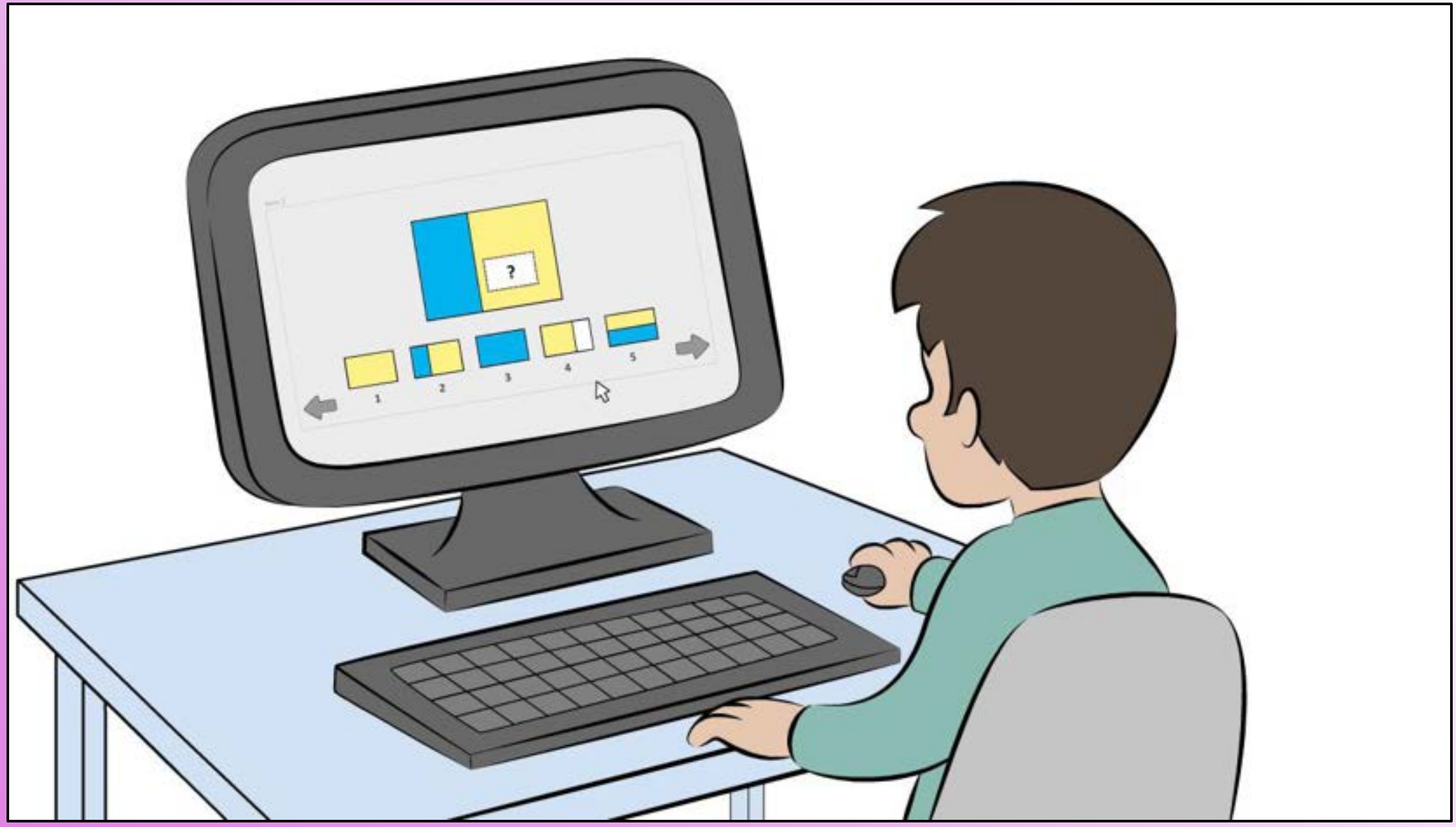
The structure of the items varies, but all items require that the student decipher the logic behind *the relationships among the shapes*, sequences, spatial orientations, patterns, and other distinguishing characteristics.

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

Naglieri General Ability Test – Nonverbal (Naglieri)

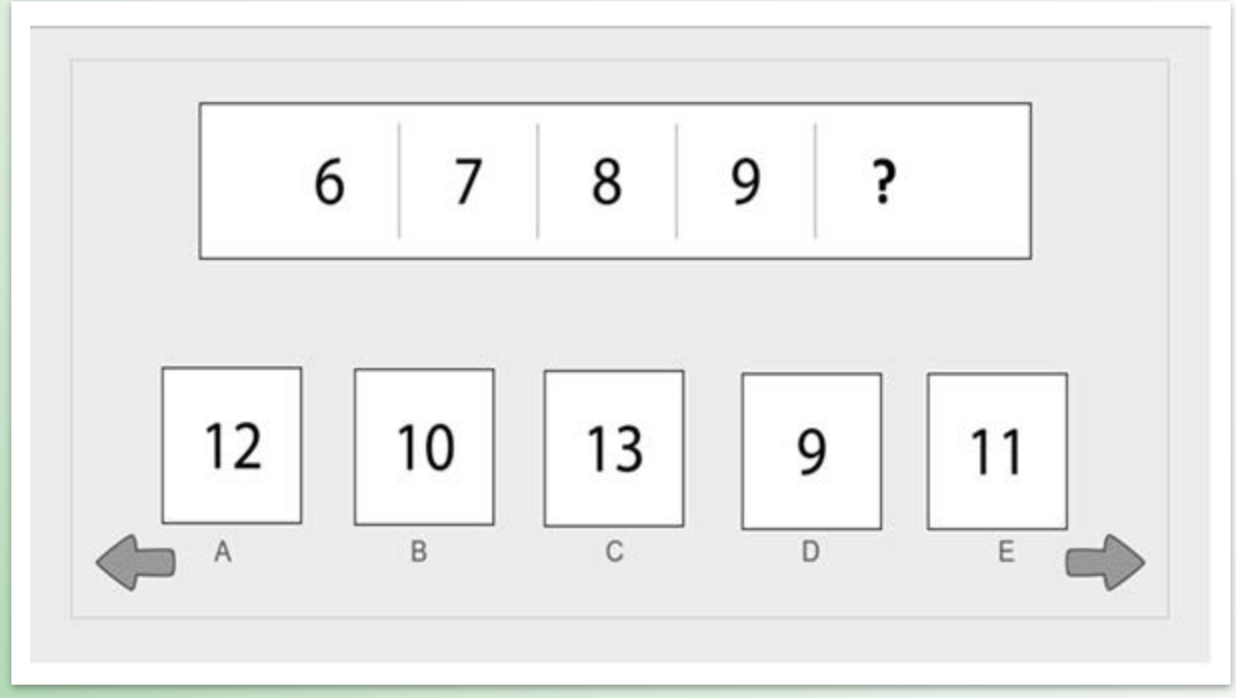

?
1
2
3
4
5

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

Naglieri General Ability Test – Quantitative (Naglieri & Lansdowne)

How do *different* tests use the *same* ability?

- Even though the tests have different content (shapes, words, numbers) they all rely on general ability (‘g’)
- They all require understanding relationships among things or ideas

Research Evidence of Equity

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

NONVERBAL TEST

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

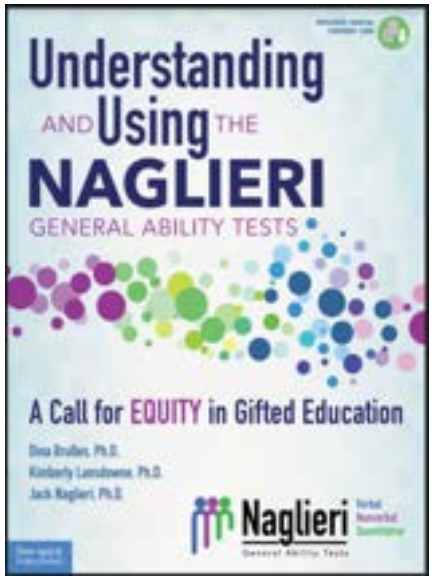
VERBAL TEST

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

QUANTITATIVE TEST

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

Race and Ethnic Differences by Ability Test



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

	By Race	By Ethnicity
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Otis-Lennon School Ability Test (distric wide)	13.6	
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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**
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).

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.

The test you choose determines the results you receive, the decisions you make, and the future of your students

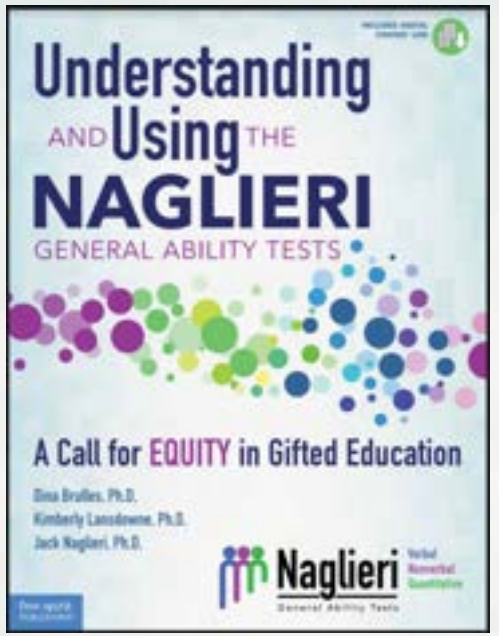
That is the *Practical Impact* of test selection

Change Demands Courage to Think Differently


QUESTIONS
ANSWERS

Programming and Instruction

- Following identification, how can we create more equitable and inclusive gifted programs and services?
- See Brulles, Lansdowne & Naglieri (2022) which covers these and other topics:
  - Logistical Considerations
  - Understanding and Using Test Scores
  - Achieving Equity in Gifted Programming
  - Culturally Responsive Approaches for Reaching and Teaching All Gifted Learners
  - Local and National Norms



Gifted & Talented

Clarification: We CAN find gifted students regardless of their academic skills

Gifted ✣ Very Smart

Talented ✣ Very Accomplished

Naglieri General Ability Tests: V, NV, Q

- CAUTION: All tests that require knowledge which were normed before COVID are likely impacted by the learning loss that has occurred
- These three tests are the ONLY measures of general ability that were normed on a post covid population
- It is best to do universal *testing of all students*
- LOCAL NORMS and NATIONAL NORMS (coming in the fall of 2023)

"For purposes of universal testing, _____ (school/school district) is using local norms to determine the top ____ percent of ***students who need specialized advanced academic services in this community***. This is important because the need for special services depends not so much on a student's standing relative to age-or grades mates nationally, but on the student's standing relative to the other students in the class, school, or district.

Since these are local scores, they may not apply in other districts. If you move to another district, your child's scores may not qualify them for specialized services, or they may need to be tested again."

Here are your child's Naglieri General Ability Tests results:

Verbal _____ percentile
Nonverbal _____ percentile
Quantitative _____ percentile

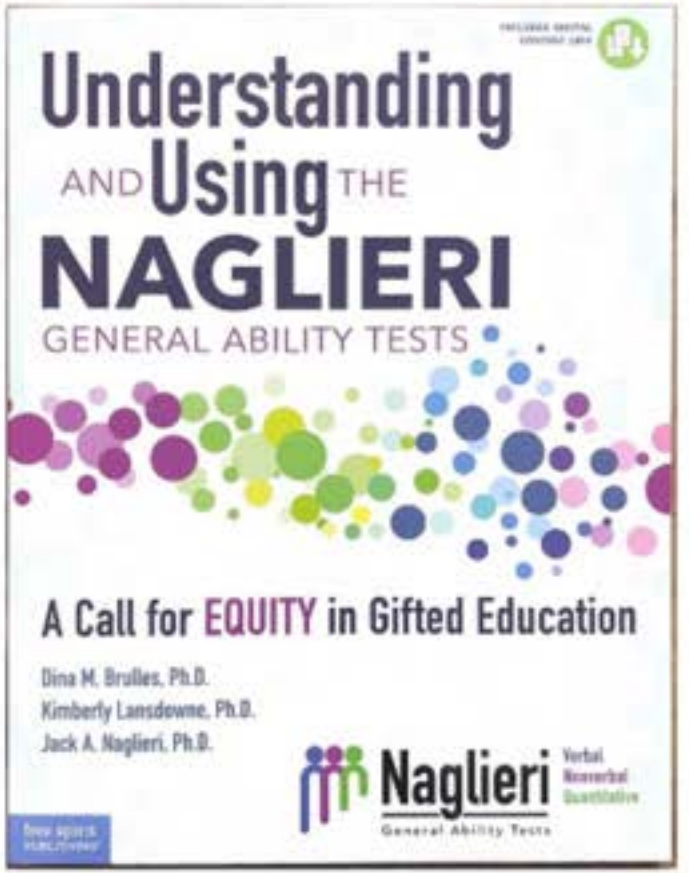
For purposes of universal testing, _____ [school/school district] is using local norms to determine the top _____ percent of students who need specialized advanced academic services in this community. This is important because the need for special services depends not so much on a student's standing relative to age- or grade-mates nationally, but on the student's standing relative to the other students in the class, school, or district.

Since these are *local* scores, they may not apply in other districts. If you move to another district, your child's scores may not qualify them for specialized services or they may have to be tested again. For more information on the Naglieri General Ability Tests, please visit the website nnba.com/info/gtOnb.

For information about advanced academic services, test scores, and what you can expect for your child, please join us for a meeting at _____ on _____ [location and date] at _____ [time] or online on _____ [date] at _____ [time]. You can also visit our website at _____ [school/school district website].

Sincerely,

[your name and title]



Using Local Norms is 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)

Things to consider when using local norms

Students who move to other schools/districts

Local norms is a local comparison

Identification for what?

Program to fit student's needs

Obtain scores for **ALL** students

What is the Practical Impact?

Services can be provided for those who otherwise would not have been identified

Summary: Equitable Assessment of Intelligence

- **Equitable evaluation of intelligence** demands test questions that can be solved regardless of the amount of academic knowledge and facility with language a student has
- We have shown that
  - General ability (*g*) **can be measured equitably** across Verbal, Quantitative and Nonverbal content if the tests do not require academic knowledge
- Verbal, Quantitative and Nonverbal are **a description of the content of the tests**' questions **NOT** different types of intelligence
- Equitable tests measure THINKING in a manner that is minimally influenced by KNOWING

Change Demands Courage to Think Differently

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


FINAL
THOUGHTS!
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