The Elephant in the Room: Identifying Underrepresented Populations

Jack A. Naglieri – Research Professor, Univ. of Virginia

Dina Brulles – Director of Gifted Education, Paradise Valley USD

Kimberly Lansdowne – Executive Director, Arizona State University

Sometimes, even if I stand in the middle of the room, no one acknowledges me.

Mystery Number is 848,400

THE ELEPHANT IN THE ROOM
let's talk about it

FOR MORE INFORMATION PLEASE GO TO OUR WEB PAGES

Conclusions

➢ Gifted identification based on verbal, nonverbal and quantitative tests requires too much knowledge of English in the directions as well as the content of questions
  - Students who come from low income families, are culturally different, or limited English skills are not assessed accurately
  - Many Hispanic and Black students are denied entry to gifted education and therefore they don't reach their potential
  - BUT…WE CAN DO BETTER !

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Today's Topics

Introduction

What Traditional Tests Measure

Three New Tests

How to Identify Gifted Students

Wall Street Journal - December 2003

➢ In kindergarten, he scored **141** on the *Naglieri Nonverbal Ability Test*

➢ He was the only African-American at his school to qualify for gifted services

➢ But Devion was NOT getting good grades in school and was not considered GT

➢ He was bored and resistant to do silly work

➢ He appeared in the *Wall Street Journal* article, and was invited to Iles magnet school

➢ He started there January 5th, 2004

➢ **WHAT HAPPENED SINCE THEN?**

THE WALL STREET JOURNAL.

MONDAY, DECEMBER 29, 2003

Brain Drain
Initiative to Leave No Child Behind Leaves Out Gifted

Educators Divert Resources From Classes for Smartest To Focus on Basic Literacy

Blow to Bright Minority Kids

By Daniel Golden

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Devion Graduated High School and...

Gifted Identification

➤ This presentation is about children who may not have good grades, or the academic skills or command of English, yet they are very smart – **gifted**

➤ These children can become very **talented** given the opportunity to learn

➤ How many children like this are in our country?

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Number of Students Missed = 848,402

848,400 non-White
247,500 ELL gifted
in grades K-12 not
served

Table 1. Number of Students in US Public Schools Grades K-12 in 2018

	US Population	Potentially Gifted (8%) of US Population	Actual Numbers of Students in Gifted & Talented Programs	Numbers of students Not Identified
White	26,822,930	2,145,834	2,065,366	80,468
Black	8,530,756	682,460	366,823	315,637
Hispanic	15,888,681	1,271,094	778,545	492,549
Native American	572,330	45,786	25,183	20,603
Two or More Races	1,782,991	142,639	123,026	19,613
Total non-White	26,774,758	2,141,979	1,293,577	848,402

From: Naglieri, J. A. (in preparation). *Manual for the Naglieri Ability Test: Nonverbal.*

Obstacle to Gifted Identification

➤ Clarification of terms…
  ▪ Gifted = very smart
  ▪ Talented = very accomplished

➤ Identification procedures
  ▪ Gifted/Talented students are often identified with traditional IQ tests comprised of verbal and quantitative tests that demand knowledge of English

➤ Using a test of ability that demands knowledge of English is not reasonable for those with limited education

> Does a verbal test that demands English really make sense? Let's try one!

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Take this IQ Test

1. Bull Durham is the name of
2. The Mackintosh Red is a kind of
3. The Oliver is a
4. A passenger locomotive type is the
5. Stone & Webster are well know
6. The Brooklyn Nationals are called
7. Pongee is a
8. Country Gentleman is a kind of
9. The President during the Spanish War was
10. Fatima is a make of

1. **tobacco**
2. **fruit**
3. **typewriter**
4. **Mogul**
5. **engineers**
6. **Superbas**
7. **fabric**
8. **corn**
9. **Mckinley**
10. **cigarette**

From: Psychological Examining the United States Army (Yerkes, 1921, p. 213)

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The Problem with Verbal and Quantitative tests

➢ When English is required in a vocabulary test of general ability this disadvantages ELL students and those with limited educational opportunity.
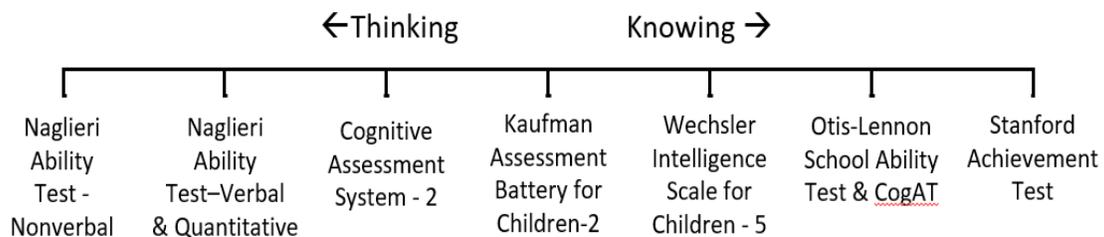
➢ Matarazzo (1972) wrote about he Wechsler Scales
  ▪ "…Vocabulary is necessarily influenced by … education and cultural opportunities (p. 218)"
  ▪ when referring to the Arithmetic subtest, "…its merits are lessened by the fact that it is influenced by education (p. 203)."

➢ The tests we use vary based on the amount of English language skills, and general verbal knowledge, required
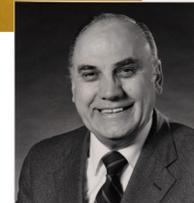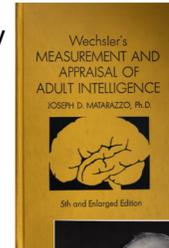
Thinking and Knowing Continuum

←Thinking   Knowing →

| Naglieri Ability Test - Nonverbal | Naglieri Ability Test–Verbal & Quantitative | Cognitive Assessment System - 2 | Kaufman Assessment Battery for Children-2 | Wechsler Intelligence Scale for Children - 5 | Otis-Lennon School Ability Test & CogAT | Stanford Achievement Test |

Tests that have reduced

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Opportunity to learn and Test Bias

➢ *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 having learned the content

➢ **Equitable assessment** can be achieved if all examinees have equal opportunity to perform

➢ The Standards also remind us that **even if the norming data do not demonstrate psychometric bias tests can still be considered unfair.**
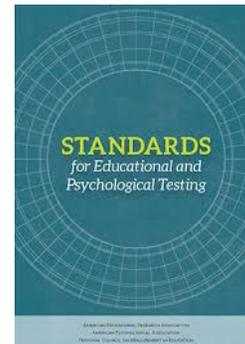
Testing Gifted Students

	Quantitative tests are often contaminated with English	Math word problems require reading and understanding the language used as well as comprehension
	Verbal tests are contaminated with knowledge of English	Vocabulary, Similarities, Word Analogies, etc.
	Measure ability using tests that do not demand English and have minimal requirement of formal learning	
	Nonverbal tests get around these problems because they measure thinking not knowing	

Measure Thinking not Knowledge

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

I know this!

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

I need to figure this out

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No Way !

Is Verbal an ability?

Just take out the language?

Turn & Talk: Should an Ability Test Require Formal Knowledge?

What do Verbal, Nonverbal and Quantitative tests measure?

General Ability…

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General ability

- "The aggregate or global capacity of the individual to act purposefully, to think rationally, and to deal effectively with his environment (Wechsler, 1939)"
- Wechsler "believed that his Verbal and Performance Scales represented different ways to access *g* (general ability), but he never believed 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)
- Yoakum and Yerkes (1920, p. 19) "Men who fail in alpha are sent to beta in order that injustice by reason of relative unfamiliarity with English may be avoided"

METHODS AND RESULTS   19

Men who fail in alpha are sent to beta in order that injustice by reason of relative unfamiliarity with English may be avoided. Men who fail in beta are referred for individual examination by means of what may appear to be the most suitable and altogether appropriate procedure among the varied methods available. This reference for careful individual examination is yet another attempt to avoid injustice either by reason of linguistic handicap or accidents incident to group examining.

It is to be emphasized that the interests of the individual who is either in the army or in process of being accepted for military service are safeguarded by a system of three types of examination which serve as sieves. Every soldier is required to take at least one examination. Men who are of low mentality, those who are of foreign birth or for other reasons illiterate, and those who exhibit marked peculiarities of behavior may be required to take either two or three examinations before the psychological report can be completed.

necessity for haste which in some instance
ing staffs to grade and report
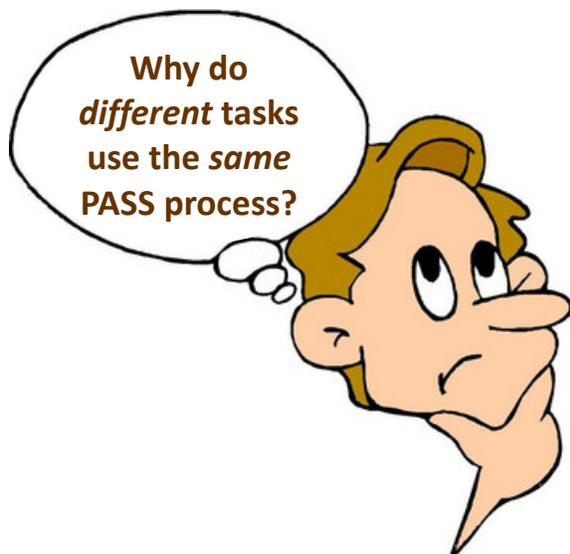
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These questions require General Ability!
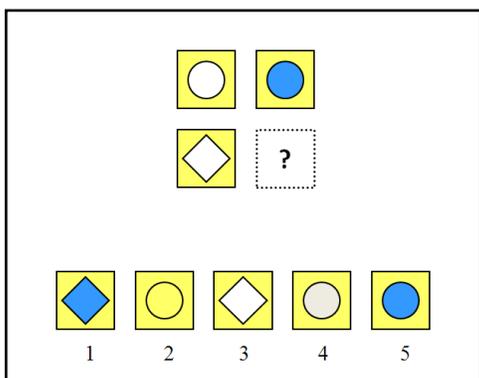
Which word is different:
girl   dog   chair   fish ?

3 is to 6 as 5 is to _____?

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

Despite the differences in content, each of these questions requires understanding the relationships among parts.

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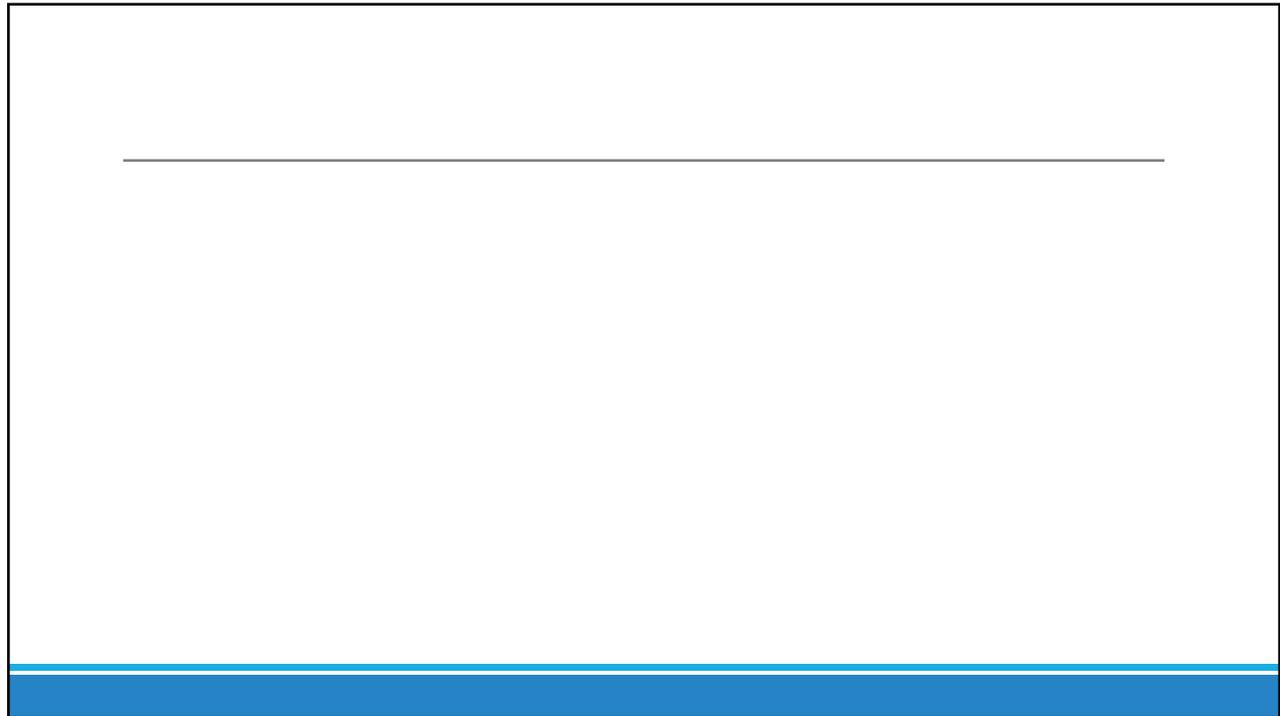
Why do *different* tasks use the *same* PASS process?

And Consider this...

➢ Even though the tasks were different in content (shapes, words, numbers & musical notations) and modality (auditory and visual), they required **Simultaneous** processing!

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Introducing The
Naglieri General Ability Test Battery (Naglieri, Brulles & Lansdowne, 2021)

Naglieri Nonverbal (Naglieri)

Naglieri Verbal (Naglieri & Brulles)

Naglieri Quantitative (Naglieri & Lansdowne)

Measuring Ability Equitably

➢ Dina Brulles, Kim Lansdowne and I have constructed three new tests that will be used for identification of gifted students

➢ The focus of these tests is EQUITABLE ASSESSMENT of all students

➢ The tests are currently in norming phase

➢ The tests measure general ability using three types of content: Verbal, Nonverbal and Quantitative

- Naglieri **Nonverbal** (Naglieri, 2021)
- Naglieri **Verbal** (Naglieri & Brulles, 2021)
- Naglieri **Quantitative** (Naglieri & Lansdowne, 2021)

Goals in Making the General Ability Test Battery

➢ Taking English out of the testing enfAbility Tests

➢ Present test instructions using either pictorial or animated formats

How to Reduce Verbal Instructions

o In order to make an ability test more accessible to a wide variety of people the *language and formal knowledge requirements must be drastically reduced*

o How to do that in a group test administration format for gifted screening?

o Use pictorial instructions as in NNAT and Wechsler Nonverbal
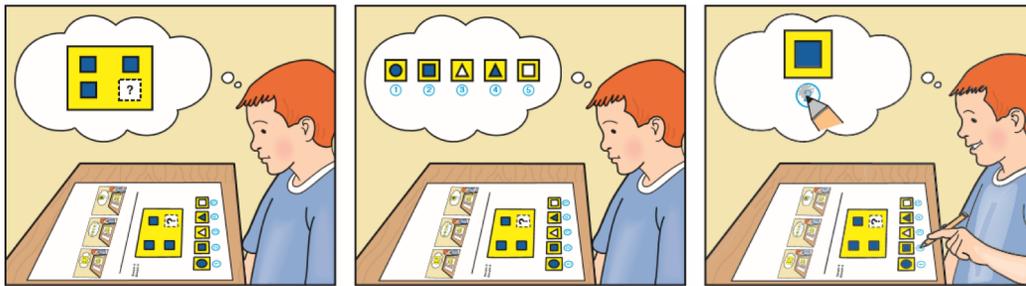

Pictorial Instructions for All Students

➤ The paper forms for the Naglieri General Ability Test Battery have *pictorial directions* that greatly reduce the need for verbal instructions

➤ Additional explanation is permitted as needed
  ▪ Naglieri Nonverbal (Naglieri, 2021)
  ▪ Naglieri Verbal (Naglieri & Brulles, 2021)
  ▪ Naglieri Quantitative: (Naglieri & Lansdowne, 2021)
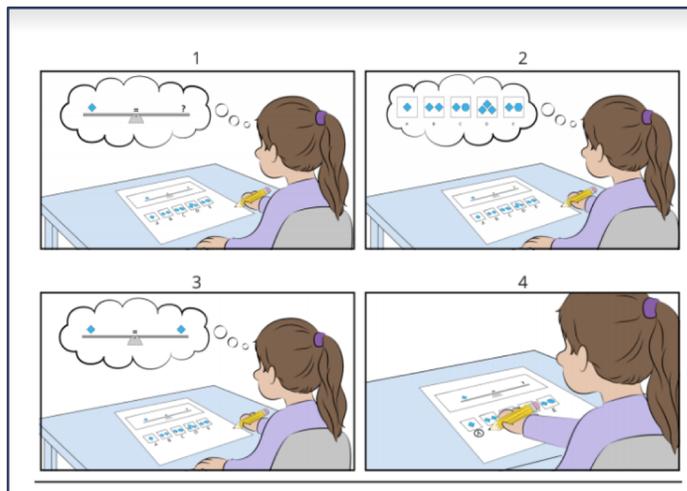
Animated Directions for All Students

➢ The online version of the *Naglieri General Ability Test Battery* have *animated directions* that greatly reduce the need for verbal instructions

➢ Additional explanation is permitted as needed

- Naglieri Nonverbal (Naglieri, 2021)
- Naglieri Verbal (Naglieri & Brulles, 2021)
- Naglieri Quantitative: (Naglieri & Lansdowne, 2021)
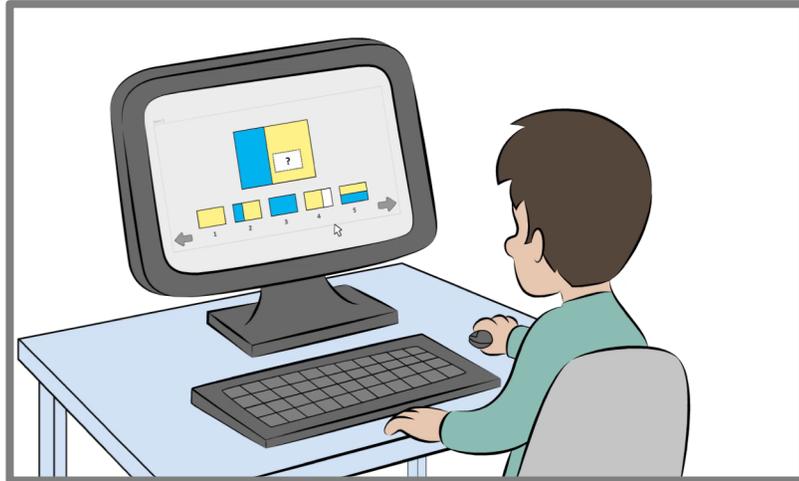
Description Of The Nonverbal Measure Of General Ability

Naglieri (in preparation)

Naglieri Ability Test - Non-verbal
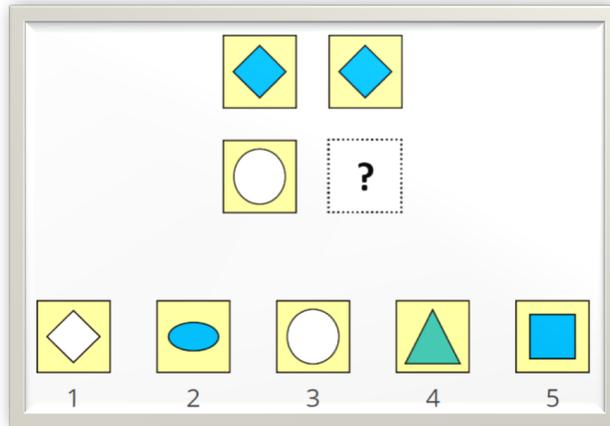
- Online and paper versions
- Group or individual administration
- Several NEW types of items have been developed
- Animated instructional video
- Interactive practice questions
- Minimal verbal directions
- Pre-K, Kindergarten, Grade 1, Grade 2, Grade 3/4, Grade 5/6, Grade 7-9, Grade 10-12

NAT-Nonverbal Pilot Study Results

➢ **SAMPLE**
  - ▪ 3,630 That closely matches the US population on key demographics

➢ **GENDER**
  - ▪ No difference 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

Slide 1

No Gender
Differences
on NNAT

Developmental gender differences on the Naglieri Nonverbal Ability Test in a nationally normed sample of 5–17 year olds

Johannes Rojahn *, Jack A. Naglieri

George Mason University, United States

Abstract

Lynn [Lynn, R. (2002). Sex differences on the progressive matrices among 15–16 year olds: some data from South Africa. *Personality and Individual Differences 33*, 669–673.] proposed that biologically based developmental sex differences produce different IQ trajectories across childhood and adolescence. To test this theory we analyzed the Naglieri Nonverbal Ability Test (NNA; [Naglieri, J. A. (1997). *Naglieri Nonverbal Ability Test-Multilevel Form*. San Antonio: Harcourt Assessment Company.]) standardization sample of 79,780 children and adolescents in grades K-12, which was representative of the US census on several critical demographic variables. NNAT data were consistent with Lynn's developmental theory of gender differences insofar as (a) there were no gender differences between 6 and 9 years; (b) females scored slightly higher between 10 and 13 years; and (c) males were ahead of females between the ages of 15 and 16. However, the discrepancies between the genders were smaller than predicted by Lynn. In fact they were so small that they have little or no practical importance. In other words, the NNAT did not reveal meaningful gender differences at any stage between the ages of 6 and 17 years.
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Slide 2
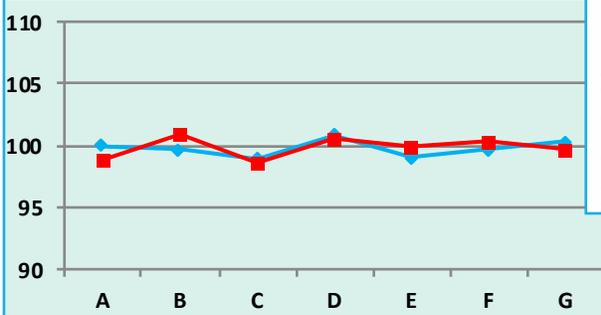
NNAT's Small Race & Ethnic Differences

	N	Mean	Diff
White	2,306	99.3	
Black	2,306	95.1	4.2
White	1,176	101.4	
Hispanic	1,176	98.6	2.8
White	466	103.6	
Asian	446	103.0	0.3

Essentials
of **CAS2**
Assessment

Jack A. Naglieri
Tulio M. Otero

Alan S. Kaufman & Nadeen L. Kaufman, *Series Editors*

WILEY

Comparison of White, African American, Hispanic, and Asian Children on the Naglieri Nonverbal Ability Test

Jack A. Naglieri and Margaret E. Ronning
Ohio State University

This study examined differences between 3 matched samples of White (n = 2,306) and African American (n = 2,306), White (n = 1,176) and Hispanic (n = 1,176), and White (n = 466) and Asian (n = 466) children on the Naglieri Nonverbal Ability Test (NNAT; J. A. Naglieri, 1997a). The groups were selected from 22,620 children included in the NNAT standardization sample and matched on geographic region, socioeconomic status, ethnicity, and type of school setting (public or private). There was only a small difference between the NNAT scores for the White and African American samples (d ratio = .25) and minimal differences between the White and Hispanic (d ratio = .17) and between the White and Asian (d ratio = .02) groups. The NNAT was moderately correlated with achievement for the total sample and correlated similarly with achievement for the White and ethnic minority groups. The median correlation of NNAT with reading was .52 and NNAT with math was .63 across the samples. Results suggest that the NNAT scores have use for fair assessment of White and minority children.
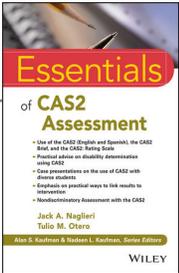
Table 1.6 Standard Score Mean Differences by Race on Traditional and Nontraditional Intelligence Tests

Test	Difference
Traditional IQ Tests	
SB-IV (matched samples)	12.6
WISC-IV (normative sample)	11.5
WJ-III (normative sample)	10.9
WISC-IV (matched samples)	10.0
Nontraditional Tests	
K-ABC (normative sample)	7.0
K-ABC (matched samples)	6.1
KABC-II (matched samples)	5.0
CAS2 (normative sample)	6.3
CAS (demographic controls of normative sample)	4.8
CAS2 (demographic controls of normative sample)	4.3

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NNAT Identified Equal Percentages

Table 2

NNAT Scores

	White		Black		Hispanic		Expected
	n	%	n	%	n	%	%
120 & above	1,571	10.3	269	9.4	190	9.5	9.0
125 & above	906	5.6	145	5.1	88	4.4	5.0
130 & above	467	2.5	75	2.6	46	2.3	2.0
135 & above	190	1.1	42	1.5	18	0.9	1.0
140 & above	90	0.6	19	0.6	9	0.4	0.4
Total Sample n	14,141		2,863		1,991		

Note. Expected percentage values are those associated with normal curve probabilities.

GIFTED IDENTIFICATION

Addressing Underrepresentation of Gifted Minority Children Using the Naglieri Nonverbal Ability Test (NNAT)

Jack A. Naglieri — *George Mason University*
Donna Y. Ford — *The Ohio State University*

ABSTRACT

A persistent problem in education is the underrepresentation of diverse students in gifted education programs. Many educators attribute the poor participation of diverse students in gifted programs to the ineffectiveness of standardized tests in capturing the ability of these students. Thus, a primary agenda of school selection committees is to find more culturally sensitive measures. This study examined the effectiveness of the Naglieri Nonverbal Ability Test (NNAT) in identifying gifted Black and Hispanic students in comparison to White students. The sample was comprised of

attribute the problem to standardized tests, contending that these tests fail to assess the strengths and abilities of culturally, ethnically, and linguistically diverse populations (e.g., Frazier et al., 1995). Support for this assertion comes from reports showing that Black, Hispanic, and Native American students consistently score lower than White students on traditional standardized tests (Brody, 1992; Sattler, 1988).

Despite the fact that intelligence tests such as the Wechsler Intelligence Scale for Children–Third Edition

PUTTING THE RESEARCH TO USE

Very Similar percentages of Black, White and Hispanic students earned a standard score of 125 (95th percentile) or above

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# Description of the Verbal Measure of General Ability

Naglieri & Brulles (in preparation)

Naglieri Ability Test - Verbal

This test was modeled after an approach described by A. R. Luria (1966) to evaluate verbal conceptual thinking.

Luria (1982) stated that language involves, "a complex system of codes (p. 29)" where, "every word *designates a thing, an attribute, an action or a relationship* (p 34)."

The task, referred to as superfluous fourth, demands that a subject reason and identify which word does not belong with the others, for example, "rose, daisy, stem, tulip,".
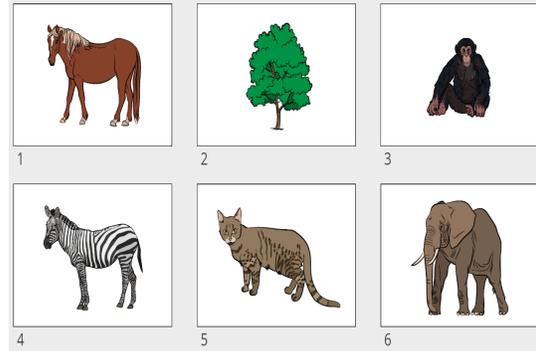
Authors: Jack Naglieri & Dina Brulles

NAT-Verbal Pilot Study Results

➤ **SAMPLE**
- 2,482 That closely matches the US population on key demographics

➤ **GENDER**
- No difference 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

# Description of the Quantitative Measure of General Ability

Naglieri & Lansdowne (in preparation)

Naglieri Ability Test - Quantitative

➢ These items demand analysis of sequences of numbers or relationships among a group of numbers. For example, 1 is to 2 (a difference of 1) as 3 is to … 4. Alternatively, the items can be solved by simply recognizing that the when analyzed vertically, 1 becomes 3, so 2 should become 4.

➢ These items test a person's ability to understand relationships and patterns involving numbers, just as understanding relationships among shapes in the NAT-Nonverbal or verbal categories in the NAT-Verbal.

Authors: Jack Naglieri & Kim Lansdowne

- Online and paper version
- Classroom and individual administration
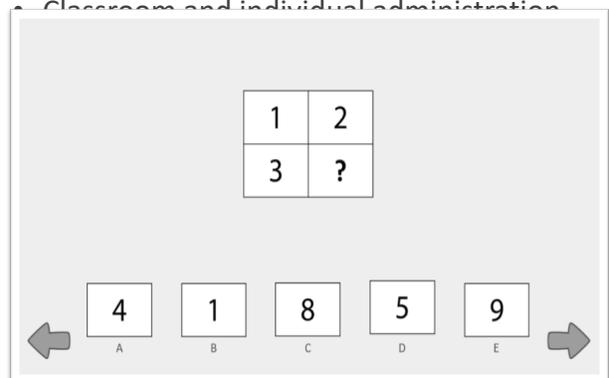
Quantitative Pilot Study Results

➢ **SAMPLE**
  ▪ 2,841 That closely matches the US population on key demographics

➢ **GENDER**
  ▪ No difference 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

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They measure the same ability?

Can you talk to the students ?

What do these tests measure?

Turn & Talk:
Do you agree that these tests all measure the same ability?

How Best to Use These Tests

Final Thoughts

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Verbal Tests Discriminate

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 n...
Mariela Montoya; JOCELYN BURG...
by her parent and next friend, Grisel...
and KASHMIR IVY, minors, by thei...
and next friend, Beverly Ivy; KRISTI...
SIFUENTES, minors, by their parent a...
friend, Irma Sifuentes,

Plaintiffs,
v.

BOARD OF EDUCATION FOR ILL...
SCHOOL DISTRICT U-46,

Defendant.

Judge Robert W. Gettleman

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

students – Hispanic and Black students for SWAS. Judge Gettlemen found discrimination regarding (a) tests for screening and for identification, (b) designated cutoff scores 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 SWAS, (f) re-testing Hispanic students for middle school gifted program, (g) timing of testing, (h) use of parental referrals, and (i) use of teacher referrals (see Table 2).

Callouts:
- CogAt Verbal, Quantitative require English
- Weighted matrix favored achievement and CogAT
- Too little reliance on NNAT

The district with 42... only 2% were identified as gifted. Did the District discriminate against Hispanic Students?

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How to Equitably Identify Gifted

➢ Do **universal screening** with ability tests that do not require knowledge of English

➢ Naglieri nonverbal has been shown to be an efficient way to test a large number of students for gifted programs

➢ Adding Verbal and Quantitative tests that do not demand knowledge of English will increase participation of under-served populations

➢ These tests will also be useful when using a matrix to avoid problems illustrated in the U-46 court case

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Dr. Dina Brulles Glendale, AZ
Gifted using NNAT in Years 2000-2006

Numbers of White and Hispanic gifted student populations between 2000-2006
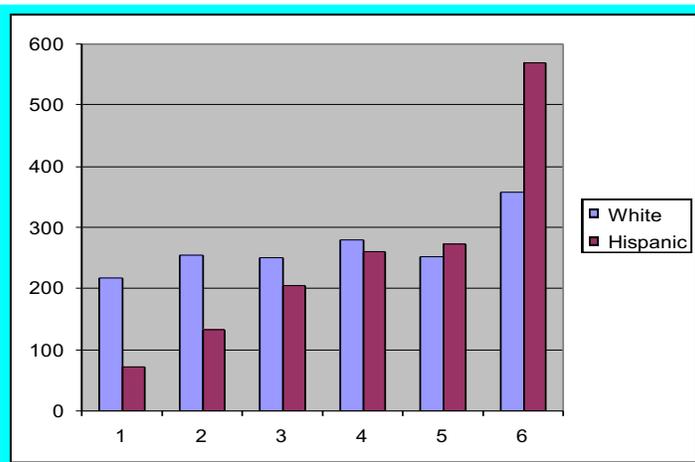
Participate in Standardization of New Tests

➢ MHS is looking for standardization sites to finalize the development of these three tests.

➢ Raw score data (like normed standard scores) could be used as part of the process to identify students for gifted and talented educational programs

➢ Contact: **Sydney Scanlan, Data Collection Coordinator at MHS: sydney.scanlan@mhs.com**

800-456-3003 ext. 447

Final thoughts and questions please

Gifted Identification is a Social Justice Issue