

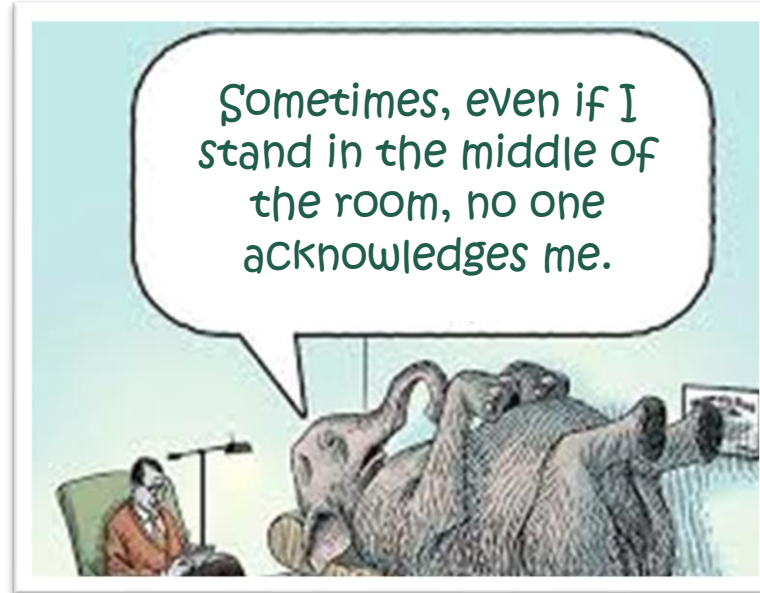
The Elephant in the Room: Identifying Underrepresented Populations

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**Mystery
Number is
848,400**



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

Jack A. Naglieri, PhD. is a Research Professor at the University of Virginia, Senior Research Scientist at the Devereux Center for Resilient Children, and Emeritus Professor of Psychology at George Mason University. With J.P. Das, he is well known for the PASS theory of intelligence and its application using the Cognitive Assessment System and Cognitive Assessment System-Second Edition.

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Conclusions

- Gifted identification based on verbal 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 even though they may be GIFTED but they are not doing well in school (talented)
 - BUT...WE CAN DO BETTER !



My Background

∅ Interest in the concept of intelligence, its measurement and instruction

Traditional IQ and Achievement Tests

- When I worked as a school psychologist I noticed that parts of the WISC was VERY similar to parts of the achievement tests
- The WISC had VERBAL (with Arithmetic) and Nonverbal Scales
- The Verbal tests were just like those on the Achievement test
- HOW DOES THAT MAKE SENSE?
- WHY THIS SIMILARITY?
- WHERE DID THIS COME FROM?

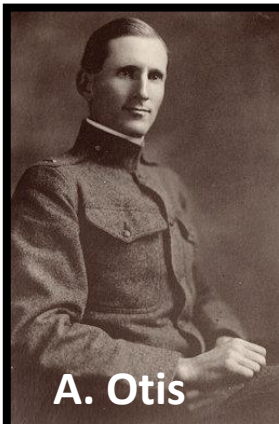


- 1975 Charles Champagne Elementary, Bethpage, NY

Evolution of IQ <http://www.jacknaglieri.com/cas2.html>



E. L. Thorndike



A. Otis



R. Woodworth

➤ A group of psychologists met at Harvard in April of 1917 to construct an ability test to help the US military evaluate recruits (WWI) for responsible positions

➤ Their goal was to develop a workable set of tests called the Army Alpha & Beta

The image shows the cover of the book 'Handbook of Intelligence' and a snippet of a page from it. The cover is blue with white text, listing editors Sam Goldstein, Dana Princiotta, and Jack A. Naglieri. The page snippet is titled 'Hundred Years of Intelligence Testing: Moving from Traditional IQ to Second-Generation Intelligence Tests' by Jack A. Naglieri. It includes a quote from Ralph Waldo Emerson and a 'Context' section describing the meeting of psychologists at Harvard in 1917.

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Sam Goldstein
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Jack A. Naglieri
Editors

Handbook of Intelligence

Evolutionary Theory, Historical Perspective, and Current Concepts

Springer

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Hundred Years of Intelligence Testing: Moving from Traditional IQ to Second-Generation Intelligence Tests

20

Jack A. Naglieri

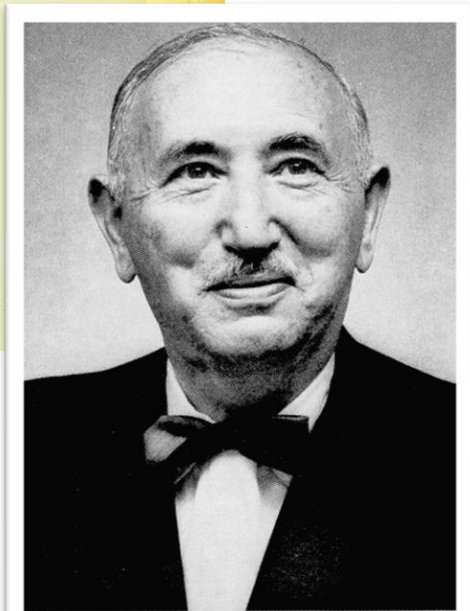
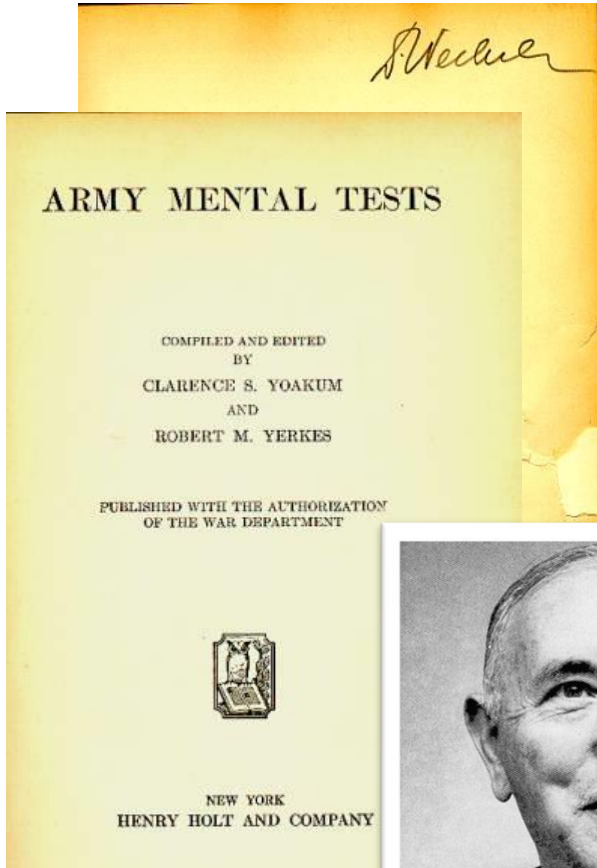
"Do not go where the path may lead, go instead where there is no path and leave a trail."
—Ralph Waldo Emerson

Context

April 6, 1917, is remembered as the day the United States entered World War I. On that same day a group of psychologists held a meeting in Harvard University's Emerson Hall to discuss the possible role they could play with the war effort (Yerkes 1921). The group agreed that psychological knowledge and methods could be of importance to the military and utilized to increase the efficiency of the Army and Navy personnel. The group included Robert Yerkes, who was also the president of the American Psychological Association. Yerkes made an appeal to members of APA who responded by providing a group of psychologists to assist with Training School in Vineland, New Jersey, on May 28. The committee considered many types of group tests and several that Arthur S. Otis developed when working on his doctorate under Lewis Terman at Stanford University. The goal was to find tests that could efficiently evaluate a wide variety of men, be easy to administer in the group format, and be easy to score. By June 9, 1917, the materials were ready for an initial trial. Men who had some educational background and could speak English were administered the verbal and quantitative (Alpha) tests and those that could not read the newspaper or speak English were given the Beta tests (today described as nonverbal).

The Alpha tests were designed to measure general information (e.g., how many months are there in a year?), common sense (e.g., why do we

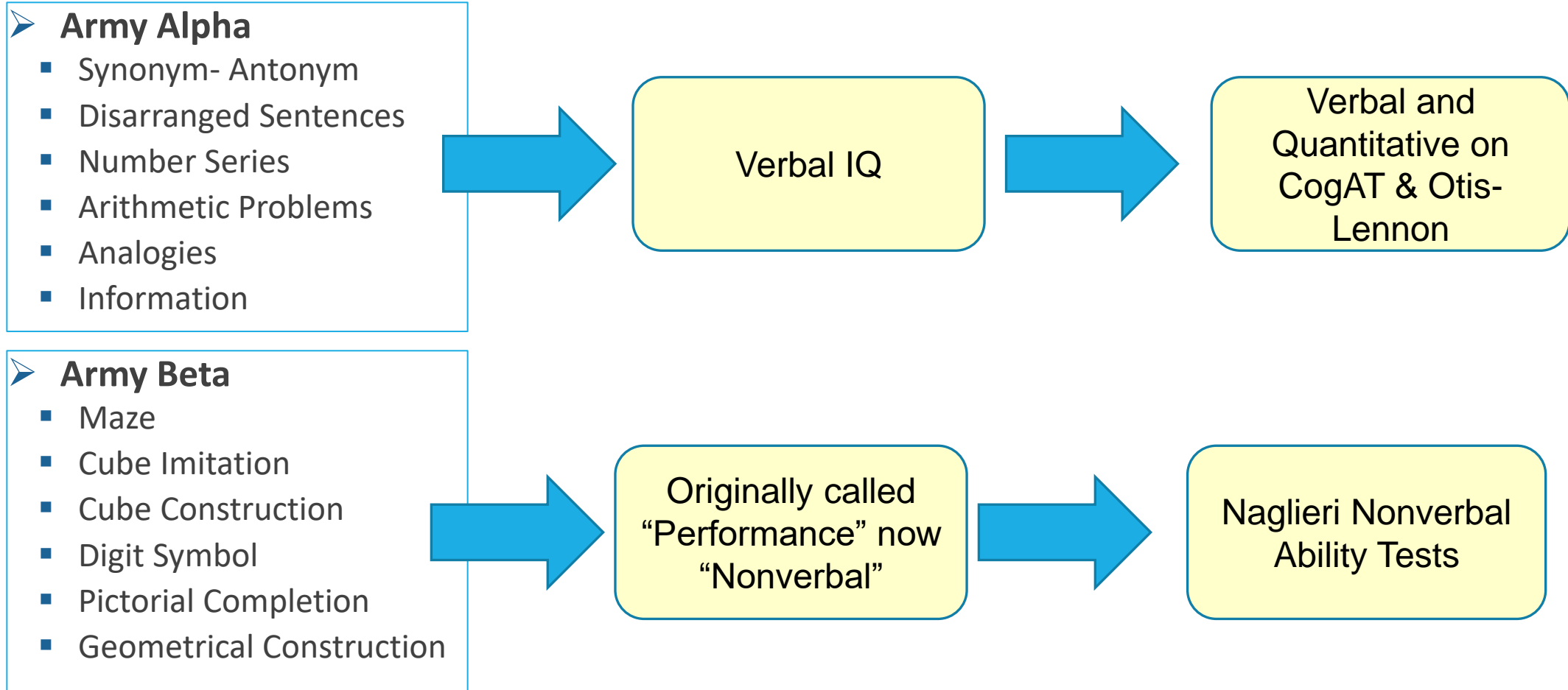
Wechsler (1939)



David Wechsler, Ph.D.

- Built his IQ test on the Army Alpha and Beta
- His definition of intelligence was “The aggregate or global capacity of the individual to act purposefully, to think rationally, and to deal effectively with his environment (1939)”
- but his test yielded a Verbal IQ and Performance IQ suggesting two types of intelligence

From Alpha & Beta to Wechsler IQ



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)

Obstacle to Gifted Identification

- Identification procedures
 - Gifted/Talented students are often identified with traditional IQ tests comprised of
 - verbal and quantitative tests that demand knowledge of English
 - Verbal directions that include many verbal concepts
- Using a test of ability that demands knowledge of English and understanding verbal directions is not reasonable
- **Clarification of terms...**
 - **Gifted = very smart**
 - **Talented = very accomplished**
- The case of Devion illustrates GIFTED

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.
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MONDAY, DECEMBER 29, 2003 - V

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

SPRINGFIELD, Ill.—To make sure even the most disadvantaged students learn the three R's, Congress two years ago passed a law known as No Child Left Behind. National test scores suggest it is indeed helping the weakest students.

There's just one problem: It may be leaving behind some of the strongest.

The 2001 law, championed by the Bush administration, calls for all public-school students to be proficient in reading and math by 2014. Schools must make steady progress toward these goals. They face penalties if they don't continually raise their proportion of proficient students, both overall and within various racial and other categories. Schools that miss milestones can be required to pay for outside tutors and let parents transfer children elsewhere.

But a school faces no penalty if top students fall off as long as they remain prof-

What's News -
Business and Finance World-Wide

THE PARMALAT SCANDAL widened, with prosecutors saying company founder Calisto Tanzi is under investigation for misappropriating about \$600 million. An Italian court Saturday declared the dairy company insolvent. Prosecutors believe Parmalat's complex global financial structure was the means by which the firm was able to mask the alleged fraud for years.

■ **Two Grant Thornton employees** are under scrutiny in connection with fraudulent documents related to their audits of a Cayman Islands-based Parmalat unit.

(Articles in Column 5 and on Page A2)

■ **The U.S. Holstein** infected with mad-cow disease might have originated in Canada. Meat companies and retailers are trying to recall beef from the cow.

■ **Some experts say** the risk of eating meat made from sick cattle remains unknown. Japan and other trading partners are unlikely to lift their bans on U.S. beef.

(Articles on Pages A3, A8, B1 and C6)

■ **Retail spending** grew a healthy 6.5% during the holiday shopping season, according to data showing MasterCard use.

(Article on Page B1)

■ **Corporate related-party deals** are attracting increased attention.

■ **U.S. AND OTHER AID** POURED into Bam, Iran's quake-blasted city. Death-toll estimates passed 22,000 after the 6.6-magnitude temblor hit the region of mud-brick structures Friday and aftershocks tumbled much of what initially survived. As many as 30,000 are injured and 100,000 are homeless. Despite policy divisions, the Bush administration dispatched seven planeloads of rescue workers and supplies. Such "earthquake diplomacy" can heal enmity. (Page A1)

Lost to humanity is the Bam citadel, a maze of crenelated walls, towers, mosques and caravanserais that lay along the ancient Silk Road. Parts of the complex dated back 2,000 years.

■ **Roadside bombs** killed two U.S. soldiers and two Iraqi children in and near Baghdad. On Saturday, a series of coordinated suicide attacks in Karbala left five Bulgarian and two Thai troops dead, as well as 12 Iraqis, including policemen. Four Americans died Friday. Japan said it would forgive most of what Iraq owes it if other Paris Club nations do likewise.

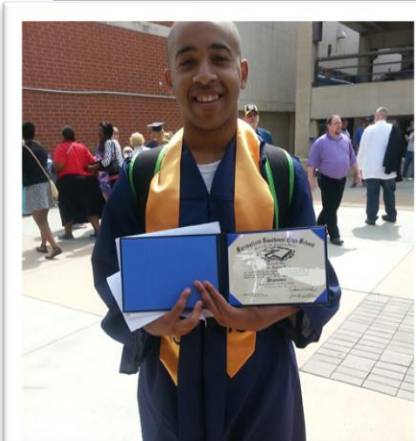
■ **North Korea** confirmed it is willing to hold a fresh round of nuclear-crisis talks with the U.S. and four other nations early in 2004. The announcement came in a weekend visit by a high-level Chinese diplomat.

■ **The chief U.N. atomic inspector** led teams in searching four Libyan nuclear-related sites, first fruits of Tripoli's renunciation of banned arms.

■ **Pakistan** will go ahead with next week's regional summit in Islamabad.

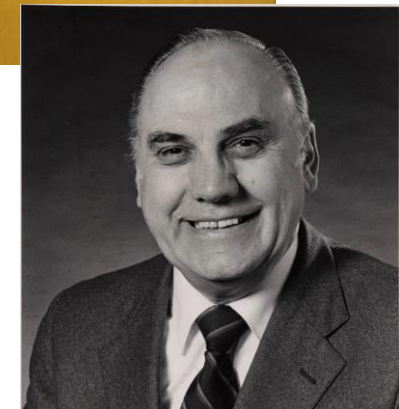
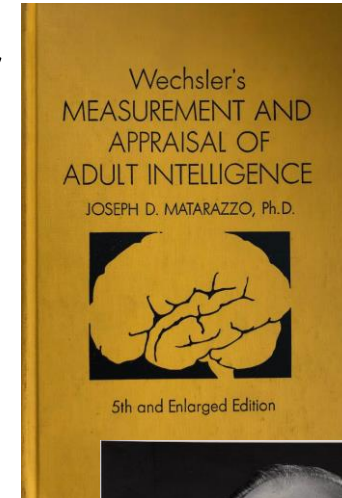
Devion Ross

Devion Graduated High School and...



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 the 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



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?

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*.

English Language Learners in the US

English language learner (ELL) students enrolled in public elementary and secondary schools in 2015 by Race and Ethnicity

	N of ELL in Public Ed	N Potentially Gifted (8%)	N students Identified	N Missed (% Missed)
White	294,763	23,581	8,548	15,033 (64%)
Black	178,141	14,251	5,166	9,085 (64%)
Hispanic	3,772,633	301,811	109,406	192,404 (64%)
Asian	511,703	40,936	14,839	26,097 (64%)
Pacific Islander	26,992	2,159	783	1,377 (64%)
Native Am./ Alaska Native	38,792	3,103	1,125	1,978 (64%)
Two or More Races	31,136	2,491	903	1,588 (64%)
Total	4,854,160	388,333	140,771	247,562

Note: The number of students identified was based on Office for Civil Rights 2013-2014 Report

Test Bias is present if there are group differences in ...

Researchers have found that IQ tests do NOT have psychometric bias

- internal consistency of items
 - reliability of test/retest scores
 - rank order of item difficulties
 - item intercorrelations
 - factor structure of test or items
 - magnitude of the factor loadings
- slope & intercept regression lines
 - correlation of raw scores with age
 - item characteristic curve
 - frequencies of choice of error distracters
 - interaction of test items by group membership

Crocker & Algina (1986). *Introduction to Classical & Modern Test Theory* (Hold, Rinehart & Winston)

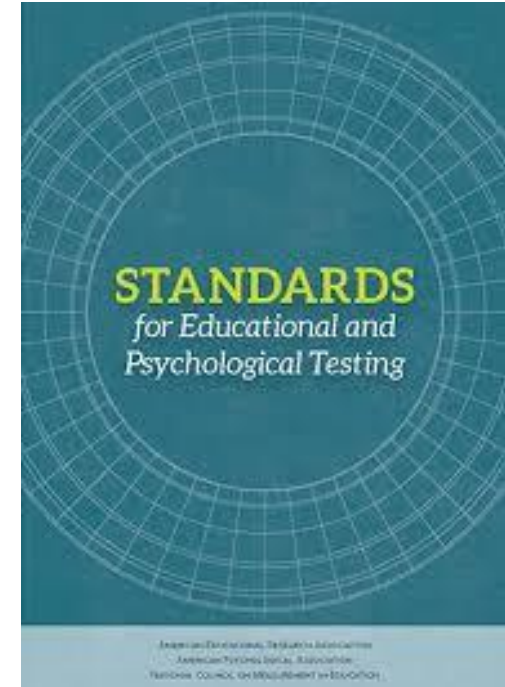
Nunnally & Bernstein (1994). *Psychometric Theory* (McGraw-Hill)

Jensen (1980). *Bias in Mental Testing* (Free Press)

Brody (1992). *Intelligence* (Academic Press)

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.

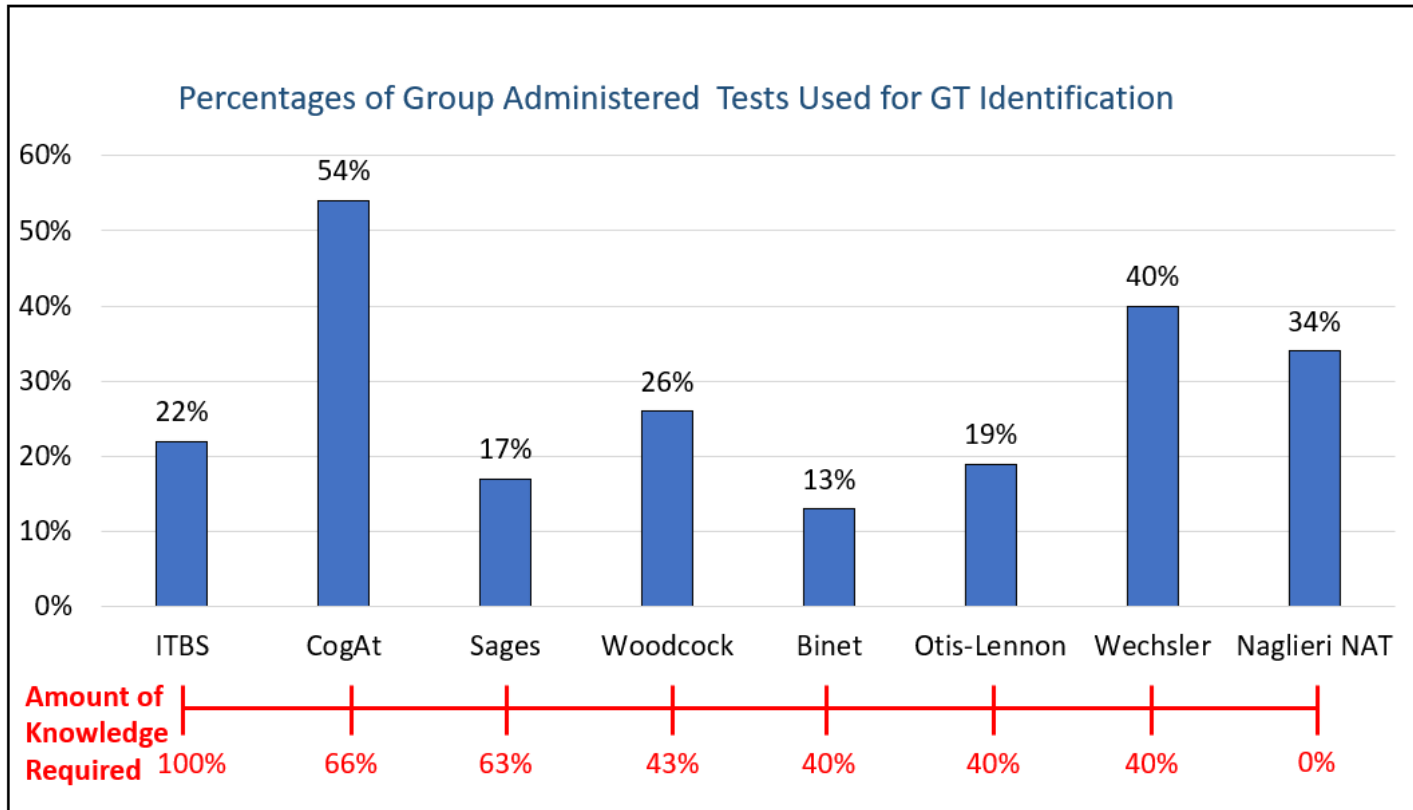


Measure ability using tests that do not demand English and have minimal requirement of formal learning



Nonverbal tests get around these problems because they measure thinking not knowing

Thinking and Knowing Continuum



Usage data from: Kurtz, H., Harwin, A., Chen, V. & Furuya, Y. (2019). *Gifted education: Results of a national survey*. Bethesda, MD: Education Week Research Center.

We estimated the amount of knowledge included in the most widely used tests used to identify gifted students according to the results of a 2019 survey (Kurtz, Harwin, Chen & Furuya). The number of scales in each test that required knowledge was determined and expressed as a percentage of the total number of scales.

Measure Thinking not Knowledge

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



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





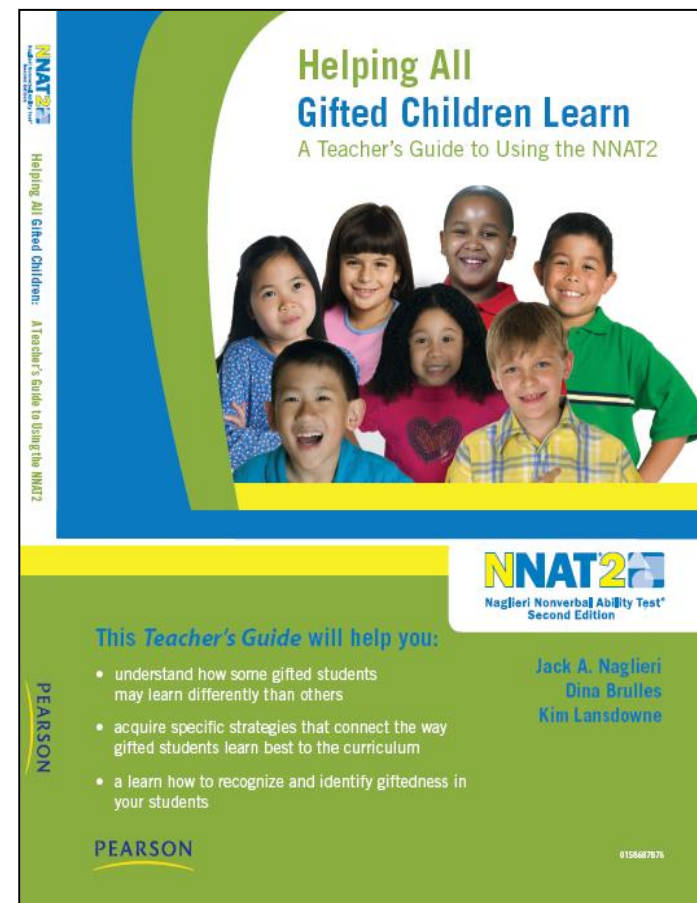
Questions or
thoughts
?

What do Verbal, Nonverbal and Quantitative tests measure?

General Ability...

General ability (Naglieri, Brulles & Lansdowne, 2009)

- General ability is what allows us to solve many different kinds of problems
- The problems may involve
 - reasoning, memory, sequencing, verbal and math skills, patterning, connecting ideas across content areas, insights, making connections, drawing inferences, analyzing simple and complex ideas.



This Teacher's Guide will help you:

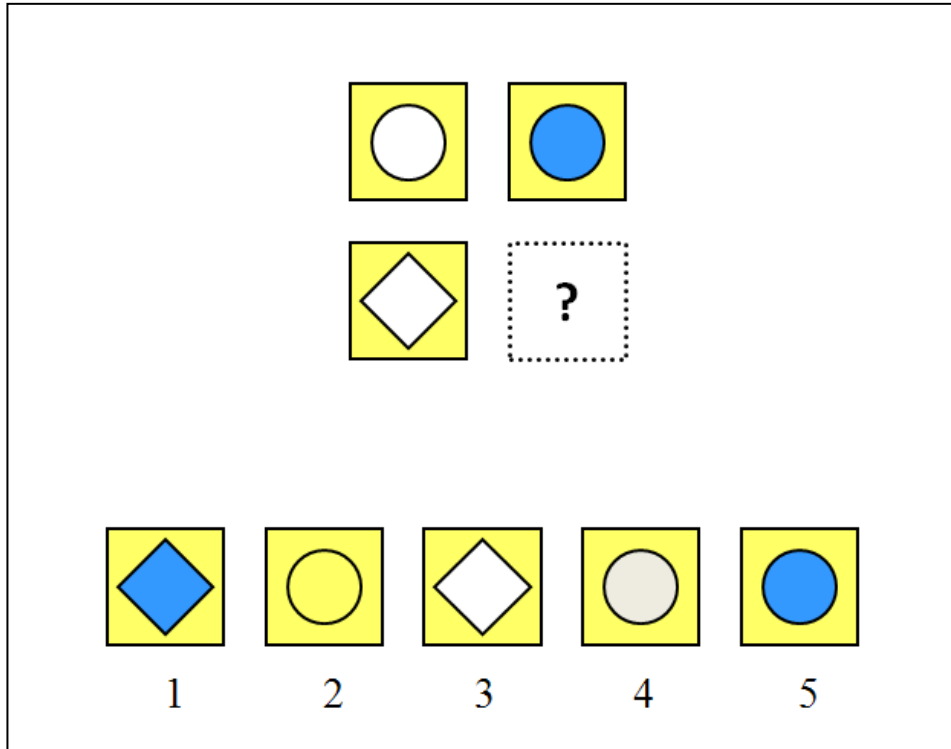
- understand how some gifted students may learn differently than others
- acquire specific strategies that connect the way gifted students learn best to the curriculum
- learn how to recognize and identify giftedness in your students

Jack A. Naglieri
Dina Brulles
Kim Lansdowne

PEARSON

0158687875

These questions require General Ability!



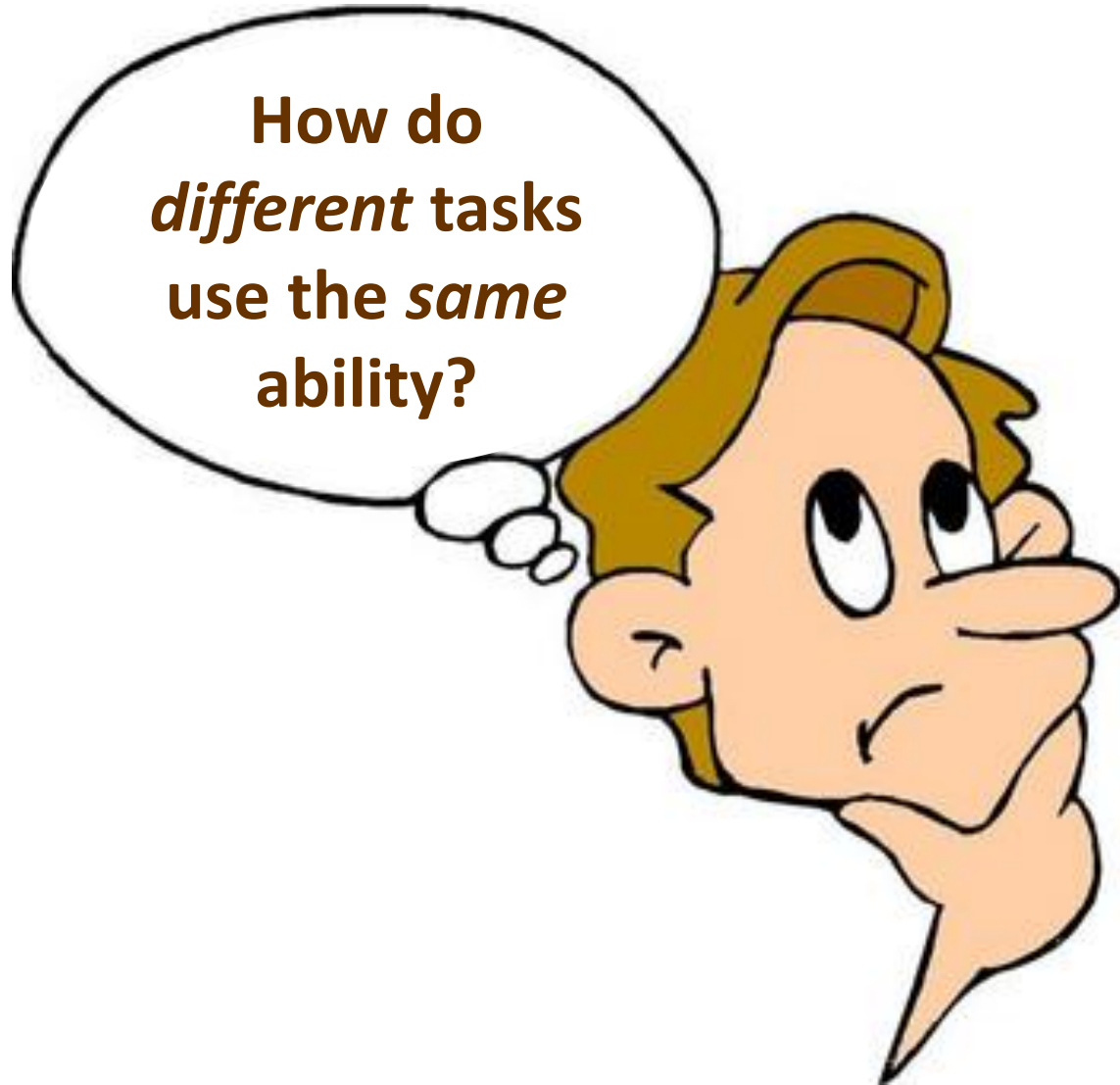
Which word is different:
girl dog chair fish ?

3 is to 6 as 5 is to _____?

C⁷ is to F as E⁷ is to _____?

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

General Ability



- Even though the tasks were different in content (shapes, words, numbers) they all rely on general ability as described by Wechsler and many others
- The reason is that they all require understanding relationships among things or ideas

What a Nonverbal Test Measures

- nonverbal assessment describes the content of the tests used to measure *general intelligence* not a theoretical construct of “nonverbal ability” (Bracken & McCallun, 1998)
- There is no assumption that nonverbal nor verbal or quantitative *abilities* are being measured
- Current research on the WISC-V, WJ IV and similar tests firmly refute the notion that these tests measure anything other than general ability.
 - See Canivez, Watkins, & Dombrowski. (2017) and Dombrowski, McGill, & Canivez, (2017)



Do Nonverbal Tests Help

It depends...

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

Psychological Assessment
2000, Vol. 12, No. 3, 328-334

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1040-3590/00/\$5.00 DOI: 10.1037/1040-3590.12.3.328

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.

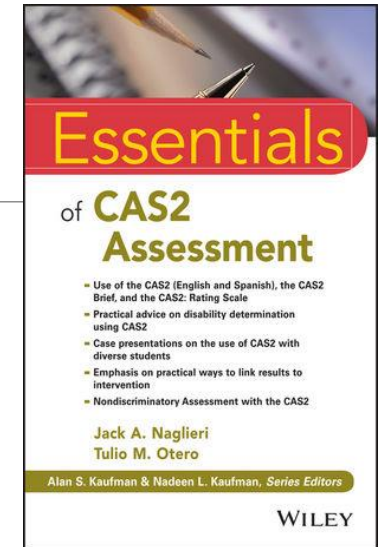


Table 1.6 Standard Score Mean Differences by Race on Traditional and Nontraditional Intelligence Tests

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

NNAT Identified Equal Percentages

Table 2
NNAT Scores

	White		Black		Hispanic		Expected %
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	
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 <i>n</i>	14,141		2,863		1,991		

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

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

Hispanic Children

Psychological Assessment
2004, Vol. 16, No. 1, 81–84

Copyright 2004 by the American Psychological Association, Inc.
1040-3590/04/\$12.00 DOI: 10.1037/1040-3590.16.1.81

BRIEF REPORTS

Comparison of Hispanic Children With and Without Limited English Proficiency on the Naglieri Nonverbal Ability Test

Jack A. Naglieri
George Mason University

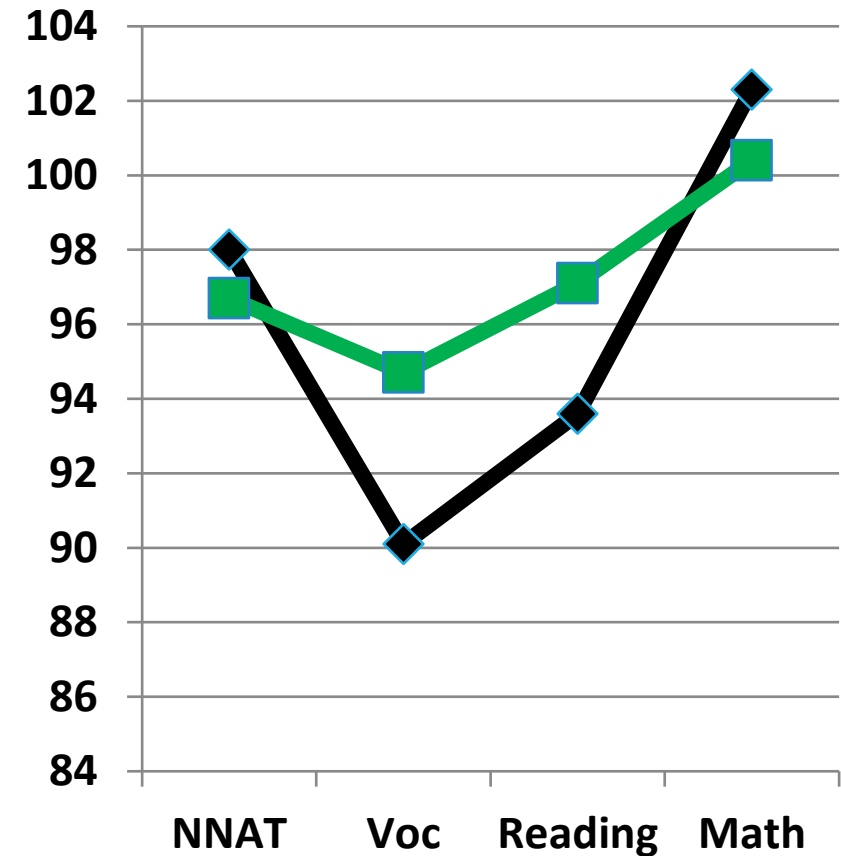
Ashley L. Booth
University of Virginia

Adam Winsler
George Mason University

Hispanic children with ($n = 148$) and without ($n = 148$) limited English proficiency were given the Naglieri Nonverbal Ability Test (NNAT; J. A. Naglieri, 1997a) and the Stanford Achievement Test—9th edition (SAT-9; 1995). The groups were selected from the NNAT standardization sample ($N = 22,620$) and matched on geographic region, gender, socioeconomic status, urbanicity, and ethnicity. There was a very small difference (d ratio = 0.1) between the NNAT standard scores for the children with limited English proficiency ($M = 98.0$) and those without limited English proficiency ($M = 96.7$). The NNAT correlated moderately and similarly with achievement for the 2 groups. The sample of children with limited English proficiency earned considerably lower scores on SAT-9 Reading and Verbal subtests. Results suggest that the NNAT may be useful for the assessment of Hispanic children with and without limited English proficiency.

Assessment of intelligence for persons with limited English language skills has been an important issue since the familiar verbal–nonverbal organization of tests was initially made popular in the Army Alpha and Beta tests (Yoakum & Yerkes, 1920). The value of a nonverbal test for evaluation of diverse populations was noted by Yoakum and Yerkes more than 80 years ago: “Men who fail in alpha [the verbal tests] are sent to beta [the nonverbal tests] in order that injustice by reason of relative unfamiliarity with English may be avoided” (p. 19). The Beta tests and other similar nonverbal tests have, therefore, served an important role in effective assessment of diverse populations because their content is

Recent research on the nonverbal approach to measuring general ability has shown that the Naglieri Nonverbal Ability Test (NNAT; Naglieri, 1997a) can be an effective way to assess general ability, yields small race and ethnic group differences, and shows good prediction of achievement. Naglieri and Ronning (2000a) provided a detailed study of mean score differences between matched samples of White ($n = 2,306$) and Black ($n = 2,306$), White ($n = 1,176$) and Hispanic ($n = 1,176$), and White ($n = 466$) and Asian ($n = 466$) children on the NNAT. Only small differences were found between the NNAT scores for the White and Black samples (Cohen’s d



No Gender Differences on NNAT



Available online at www.sciencedirect.com

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Intelligence 34 (2006) 253–260



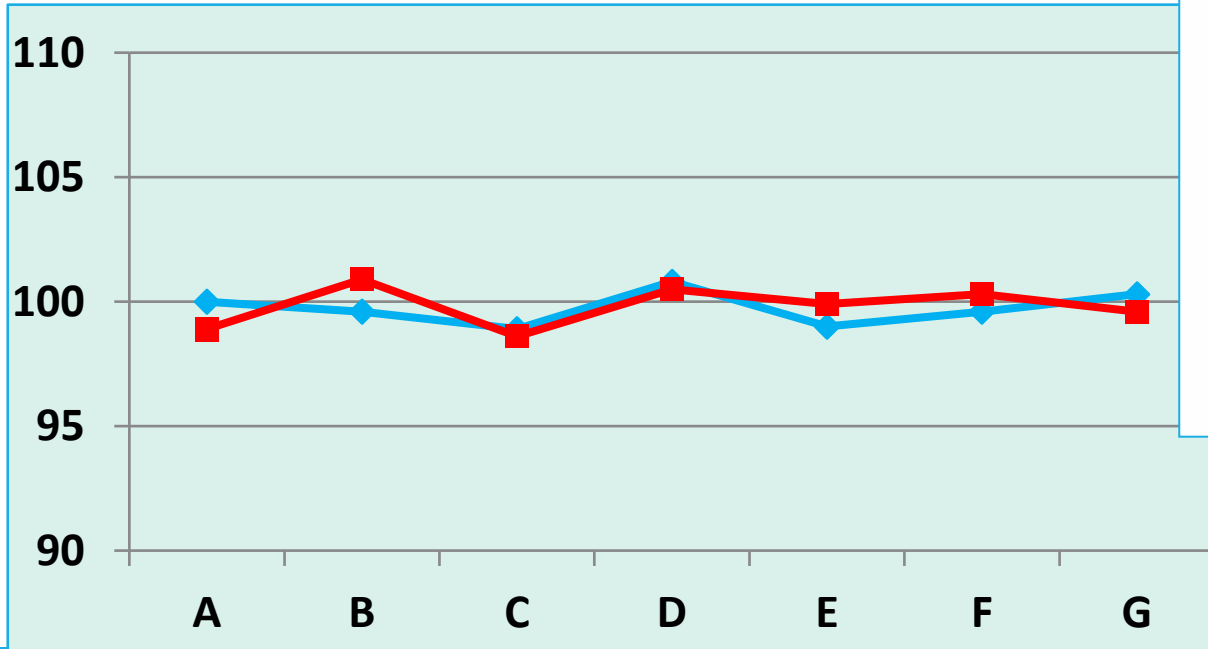
Developmental gender differences on the Naglieri Nonverbal Ability Test in a nationally normed sample of 5–17 year olds

Johannes Rojahn*, Jack A. Naglieri

George Mason University, United States

Received 22 June 2005; received in revised form 18 September 2005; accepted 26 September 2005

Available online 14 November 2005



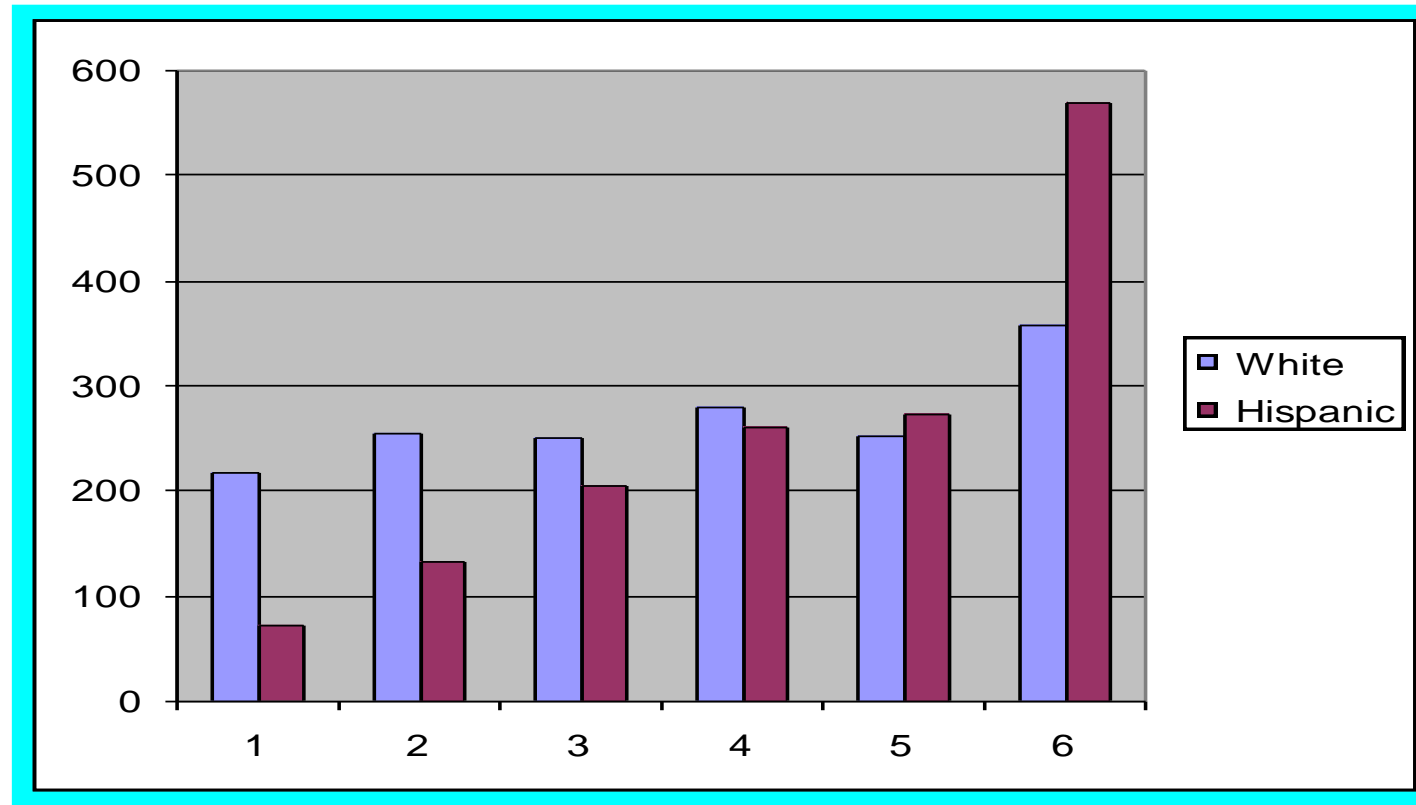
Abstract

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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Dr. Dina Brulles Glendale, AZ

Gifted using NNAT in Years 2000-2006



Numbers of gifted population depicted by ethnic representation of White and Hispanic gifted student populations between 2000-2006

ID Rates for NNAT and COGAT

2013-2015 Screening pool					
NNAT			COGAT VQN		
Ethnic Group	Frequency	Percent	Ethnic Group	Frequency	Percent
White	1492	80.6%	White	1333	89.0%
Black	87	4.7%	Black	40	2.7%
Hispanic	272	14.7%	Hispanic	125	8.3%
Total	1851		Total	1498	
% Increase for Blacks -->			54.0%		
% Increase for Hispanics -->			54.0%		



Questions or
thoughts
?

Increasing Equity

Hidden problems (highly verbal instructions)

Universal screening

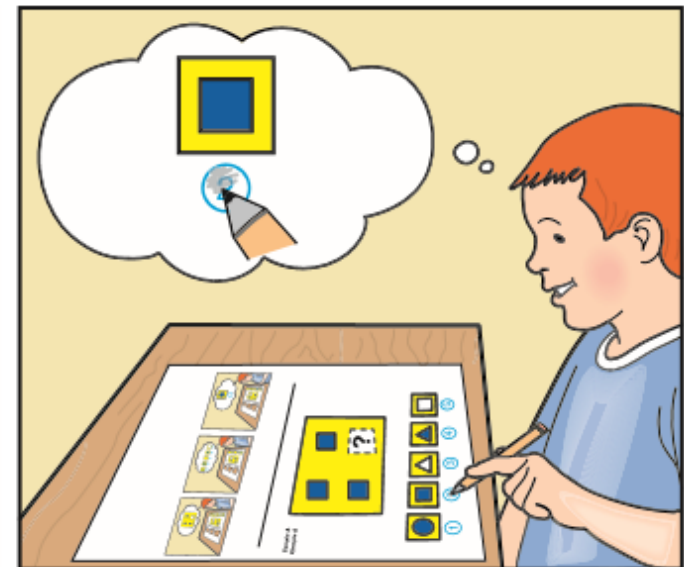
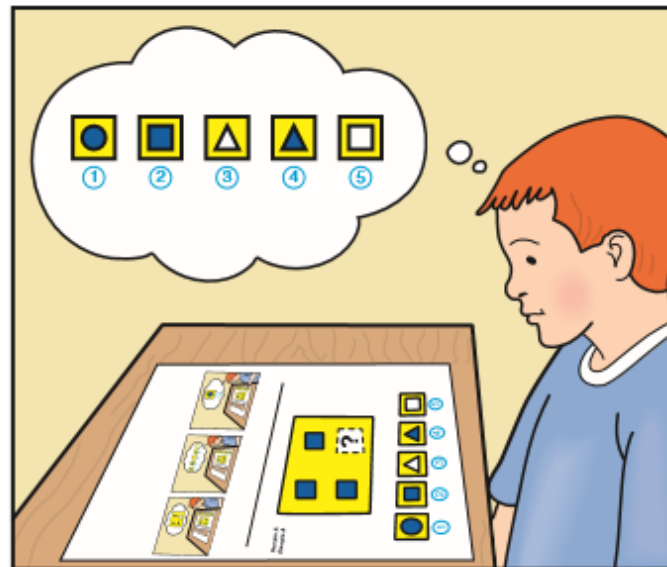
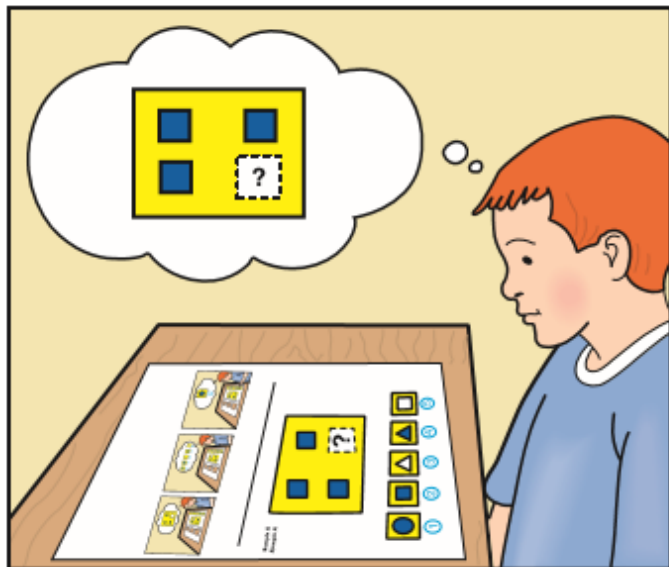
Test score interpretation

Nonverbal Test Directions

- Cummings and Nelson (1980) found that the instructions for the *California Achievement Test and Iowa Test of Basic Skills* included many basic concepts that students may **not** have mastered at the ages for which the tests were intended.
- Randall, Engle, Carullo, Collins (2015) found that students' ability to recall directions presented orally in the classroom was related to their working memory capacity.
- The most widely used group administered test has a nonverbal scale that requires considerable comprehension of verbal directions and working memory.
 - The instructions for the first sample item intended for administration to 5 and 6-year-olds contain 31 lines of text and approximately 400 words and many verbal concepts and complex verbal statements like this: The small circle goes with the large circle in the same way that the small square goes with the large square.
- The inclusion of verbal concepts and strain on working memory will obviously be an obstacle to understanding the demands of the task for any student with limited verbal knowledge and skills.

How to Reduce Verbal Instructions

- 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*
- How to do that in a group test administration format for gifted screening?
- Use pictorial instructions as in NNAT and Wechsler Nonverbal



Testing the NNAT2

➤ Economists David Card of the University of California, Berkeley, and Laura Giuliano of the University of Miami studied the effects of using NNAT2 for GT identification

PNAS

Universal screening increases the representation of low-income and minority students in gifted education

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Edited by Greg J. Duncan, University of California, Irvine, CA, and approved October 12, 2016 (received for review March 27, 2016)

Low-income and minority students are substantially underrepresented in gifted education programs. The disparities persist despite efforts by many states and school districts to broaden participation through changes in their eligibility criteria. One explanation for the persistent gap is that standard processes for identifying gifted students, which are based largely on the referrals of parents and teachers, tend to miss qualified students from underrepresented groups. We study this hypothesis using the experiences of a large urban school district following the introduction of a universal screening program for second graders. Without any changes in the standards for gifted eligibility, the screening program led to large increases in the fractions of economically disadvantaged and minority students placed in gifted programs. Comparisons of the newly identified gifted students with those who would have been placed in the absence of screening show that Blacks and Hispanics, free/reduced price lunch participants, English language learners, and girls were all systematically “underreferred” in the traditional parent/teacher referral system. Our findings suggest that parents and teachers often fail to recognize the potential of poor and minority students and those with limited English proficiency.

gifted identification | universal screening | underrepresentation

Low-income and minority students are substantially underrepresented in gifted and talented education programs in the United States (1, 2). In 2012, 7.6% of White K–12 students participated in gifted and talented programs nationwide, compared with only 3.6% of Blacks, 4.6% of Hispanics, and 1.8% of English learners (ocrdata.ed.gov/StateNationalEstimations/Estimations_2011_12). Some of this gap may be due to differences in measured cognitive ability of students from different backgrounds and biases in these measures. However, the standard processes for gifted screening are based on teacher and parent referrals, and there is evidence of underreferral of qualified students from disadvantaged backgrounds—suggesting that teacher/parent discretion in the referral process may be a further barrier (3–7). If so, then a comprehensive and objective screening program might be able to raise gifted participation rates among underserved groups by increasing their referral rates for gifted evaluation.

We test this hypothesis using data from a unique natural experiment conducted by a large and diverse school district in the state of Florida (hereafter “the District”). State law dictates that students

program, all second graders completed the Naglieri Non-Verbal Ability Test (NNAT), a nonverbal test intended to assess cognitive ability independent of linguistic and cultural background (8). The NNAT takes less than an hour to complete and was administered by teachers in the classroom. The NNAT scores were used to construct a nationally normed index with a mean of 100 and SD of 15, similar to a standard IQ test. All students scoring at least 130 points on the test, and ELL/FRL students scoring at least 115 points, were automatically eligible to be referred for full evaluation and regular IQ testing by District psychologists. Because students could still be nominated for testing by parents or teachers as in earlier years, the aim of the screening program was to supplement the traditional referral system and boost referral rates for underrepresented groups.

The other key features of the District’s gifted identification process remained unchanged. Referred students were placed in a queue for a full IQ test given by a District psychologist, although parents could bypass the queue by paying to have their child tested privately. Students with IQs above the relevant threshold were eligible for gifted status, with the final determination based on parent and teacher inputs and scores on a checklist of “gifted indicators.” (*Supporting Information* provides more details on the District’s gifted screening and identification procedures. See ref. 9 for additional information on the District’s gifted program.) Importantly, the IQ thresholds and other requirements for gifted eligibility were unchanged. Any increase in the number of students identified as gifted following the introduction of the program can thus be attributed to the screening effort, and not to a relaxation of the standards for gifted status. [While the screening program may have raised parent and teacher awareness about the gifted program, the return of gifted rates to their prescreening levels after the program was suspended in 2011 (Fig. 1) suggests that increased awareness cannot explain the rise in gifted rates after the program’s introduction.]

Significance

A longstanding concern about gifted education in the United States is the underrepresentation of minorities and economically disadvantaged groups. One explanation for this gap is that standard processes for identifying gifted students, which are based largely on the referrals of parents and teachers, tend to miss many qualified students. Consistent with this hypothesis, we find that a universal screening program in a large ur-

Testing the NNAT2

- In Broward County more than half of its students are black or Hispanic, and a similar proportion are from low-income families. Yet, just 28% of third graders who were identified as gifted were black or Hispanic.
- Under that system, the district had relied on teachers and parents to make referrals.

Card & Giuliano (2017) www.pnas.org/cgi/doi/10.1073/pnas.1605043113

- Effects of giving NNAT to all students in years 2006 and 2007 (N = 79,650)

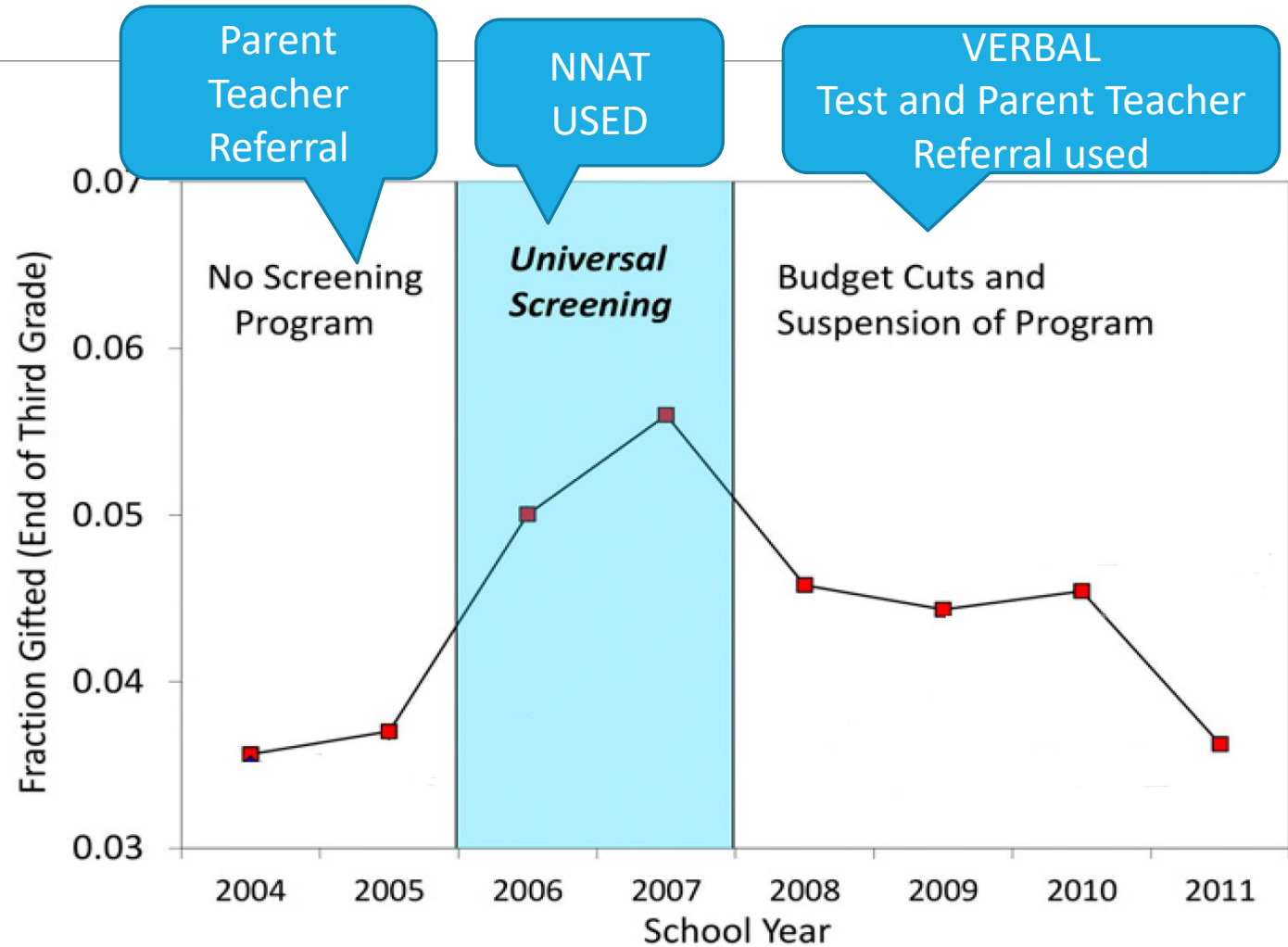


Fig. 1. Fraction gifted by end of third grade,

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 next friend,)
Mariela Montoya; JOCELYN BURCH,)
by her parent and next friend, Griselda)
and KASHMIR IVY, minors, by their parent and)
next friend, Beverly Ivy; KRISTIANNE)
SIFUENTES, minors, by her parent and next)
friend, Irma Sifuentes,

Plaintiffs,

v.

BOARD OF EDUCATION FOR ILLINOIS)
SCHOOL DISTRICT U-46,)
Judge Robert W. Gettleman

Defendant.

On July 11, 2013, Judge Robert Gettleman 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

CogAt Verbal, Quantitative require English

Weighted matrix favored achievement and CogAT

Too little reliance on NNAT

students - Hispanic and Black students for SWAS. Judge Gettleman 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).

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

Local Norming Procedure for V, NV, & Q

- Obtain scores for **ALL** students (not only referred students) in the grades for which the GT decisions is needed
- Decide how the information obtained for each student is to be evaluated (i.e., average, and or logic) and if it is to be weighted
- Rank order the students' raw scores on the V, NV & Q tests
 - Raw scores can be converted to percentile or standard scores as desired
- Determine a cut-score based on the number of students the GT program can accommodate
- Evaluate the outcome

Introducing The Naglieri Tests of General Ability

(Naglieri, Brulles & Lansdowne, 2021)

Naglieri Nonverbal (Naglieri)
Naglieri Verbal (Naglieri & Brulles)
Naglieri Quantitative (Naglieri & Lansdowne)



Naglieri

General Ability Tests

Verbal
Nonverbal
Quantitative



The Naglieri General Ability Tests (Naglieri, Brulles & Lansdowne, 2021)
Naglieri Nonverbal (Naglieri)
Naglieri Verbal (Naglieri & Brulles)
Naglieri Quantitative (Naglieri & Lansdowne)

Verbal Nonverbal Quantitative



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 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)

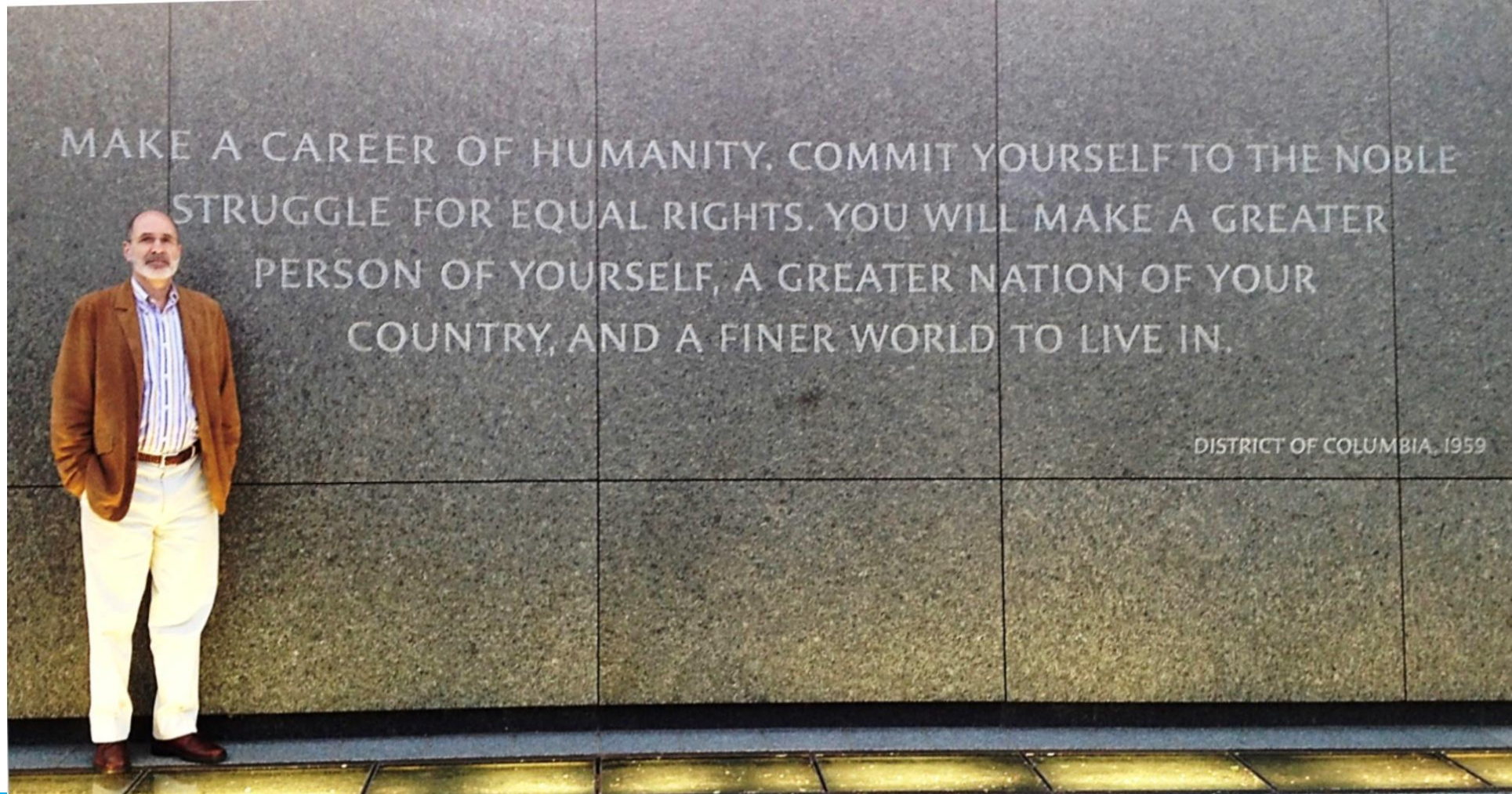
Goals in Making the General Ability Test Battery

- Taking English out of the testing environment
- Present test instructions using either pictorial or animated formats
- Create a **Verbal test** that can be solved using any language
 - The test is based on a neuropsychological concept from A. R. Luria which demand identification of verbal concepts
- Create a new version of **nonverbal test**
 - New ways of constructing progressive matrices have been developed which demand understanding the relationships among graphical stimuli
- Create a **Quantitative test** that does not require language
 - Several types of items are used to evaluate how well a student understands quantitative relationships



Final thoughts
and questions
please

Gifted Identification is a Social Justice Issue



**WE CAN DO
BETTER**