



Intellectual Assessment as a Social Justice Issue: Theoretical Considerations and Practical Solutions

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Disclosures



- We will be speaking about publications we have authored that are designed to reinvent intelligence based on the theory of basic psychological processes called PASS (Naglieri & Das, 1997) as measured by the Cognitive Assessment System (1997; 2nd Ed 2014).

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BIG Picture

What do we want from out from intelligence tests?

- A general picture of the student → Average, Gifted, Intellectual Disability
- A *fair and equitable* way to assess ability for students who are ELL and those from diverse populations
- A more detailed picture for specific learning disability
 - A way to measure basic psychological processes to determine the student's pattern of learning strengths and weaknesses

In this session you will learn about how we can achieve all these goals with emphasis on Social Justice issues.

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Core Group Discussion → Deeper Learning

- Coach – Help the group decide what to do
- Organizer – Have your group discuss the case of Manuel
- Reporter – Keep notes and speak for the group
- Energizer – Focus the group !



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Topical Outline

IQ tests and social justice are related

- Content of traditional IQ
- test items that require thinking versus knowing
- Are verbal tests needed for validity?
 - Evidence from KABC, CAS, NNAT, WISC5

Making Intelligence tests socially just

- Measure Neurocognitive ability (PASS)
 - A look at PASS and its measurement
 - research on race & ethnic differences on intelligence tests
- The impact this has on SLD and ID disability diagnosis

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Case of a male 7th grader -History

- **Manuel** had recently moved from New York to Puerto Rico at the end of 6th grade. Was English dominate.
- Parents and grand parents spoke Spanish at home.
- His two-year older sister always spoke English.
- Manuel understood Spanish but never had the need to speak it.
- **Early Educational Issues**
 - Manuel had a history of significant speech dysfluency, attention issues and difficulty learning math facts.
 - He received Speech and Language services in grades 5 & 6.



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1970-1972 Puerto Rico Public Schools J.J. Ozuna and then Luis Pales Matos

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The influence of Language on Knowledge



- Manuel attended public school. Instruction was all in Spanish.
- As happens with most 2nd language learners, he barely verbally communicated with peers or with teachers for the first year. Insecurity, fear, anxiety and limited vocabulary paralyzed him.
- Limited Spanish proficiency.
- Manuel had difficulty adjusting to his new language and cultural milieu. Although parents were Puerto Rican he was considered by peers as not really like them.
- Manuel did not participate in class, did not always understand the class lecture.
- Manuel began skipping class and hanging out with others who were doing the same and engaging in mischief.
- After several visits to the principal's office and to the part-time school social worker, Manuel was *referred to a psychologist* for an evaluation.

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Evaluation Results & Recommendations (1973)



Low scores on the WISC-Spanish (70s) similar achievement



Manuel was doing as well as is expected given his low IQ.



Dysfluent Speech, Probable low self esteem & Cultural Adjustment issues



Recommendations

Provide tutoring
Provide opportunities for student to increase Spanish vocabulary.

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Core Group Discussion

- Organizer – Have your group discuss the case of Manuel
- Coach – Help the group decide what to do
- Recorder – Keep notes on the conversation
- Energizer – Focus the group !



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THE REST OF THE STORY...



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In 1977

- Manuel graduated from High School with A's and B's, left PR to attend college, went through a similar transition and adaptation process though college as he entered with the equivalency of a 6th grade formal English language education.
- He had poor GRE Scores, cultural adjustment issues, speech/language problem, attention, and learning issues continued.
- Professors told Manuel that college may not be this best option and doubted he would get into graduate school.
- And ...

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Population Trends

- The United States Census Bureau estimates the Hispanic population would be 19% by 2020 (USCB, 2017).
- By 2020 Hispanic's children will represent 27% of U.S. Public school enrollment (NCES, 2015) and are projected to represent 30% by 2023 (USCB, 2017).
- A large number of these children have learning difficulties, and they are eligible for special educational services (Alliance for Excellent Education, 2006).
- According to the U.S. commission on civil rights (2009) an overrepresentation in special education is concentrated among minorities, including Hispanics.
- There is inequality in educational opportunities, and children who were misidentified with a specific learning disabilities or who were never identified could be significantly harmed.

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Social Justice and Psychology

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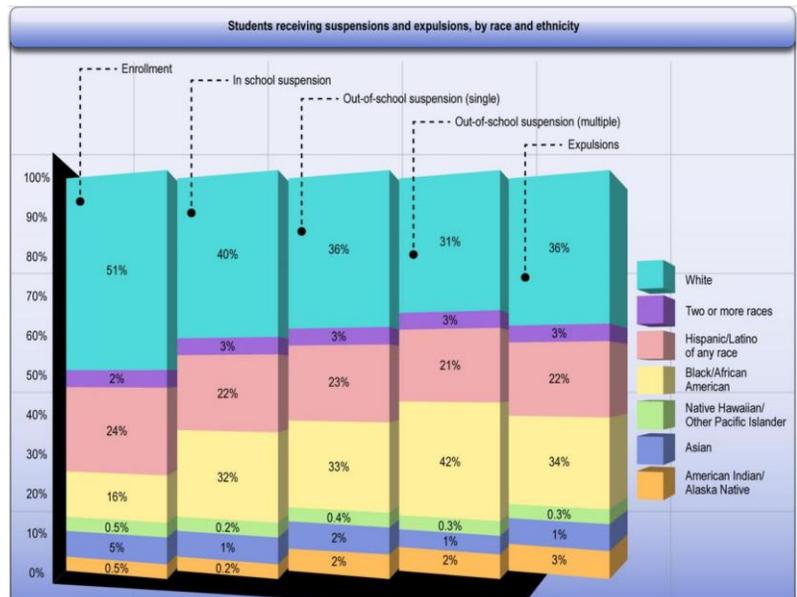
A bit of History

- In 2007, members of the U. S. Commission on Civil Rights were briefed on the improper placement of Hispanic and Black students in SPED programs (USCCR, 2007).
- Sullivan (2011) noted that although special education is a field built on the principle of fairness and grounded in the rhetoric of the civil rights movement, persistent disproportionality strongly indicated systemic problems of inequity, prejudice, and marginalization.

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US Department of Civil Rights March, 2015

Although only 16 % of enrollment in Public schools, Black students are more likely to be identified with as having behavior or emotional disturbance than peers.



NOTE: Detail may not sum to 100% due to rounding. Totals: Enrollment is 49 million students, in-school suspension is 3.5 million students, single out-of-school suspension is 1.9 million students, multiple out-of-school suspension is 1.55 million students, and expulsion is 130,000 students. Data reported in this figure represents 99% of responding schools.

SOURCE: U.S. Department of Education, Office for Civil Rights, Civil Rights Data Collection, 2011-12.

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National Education Association (NEA) (2015)

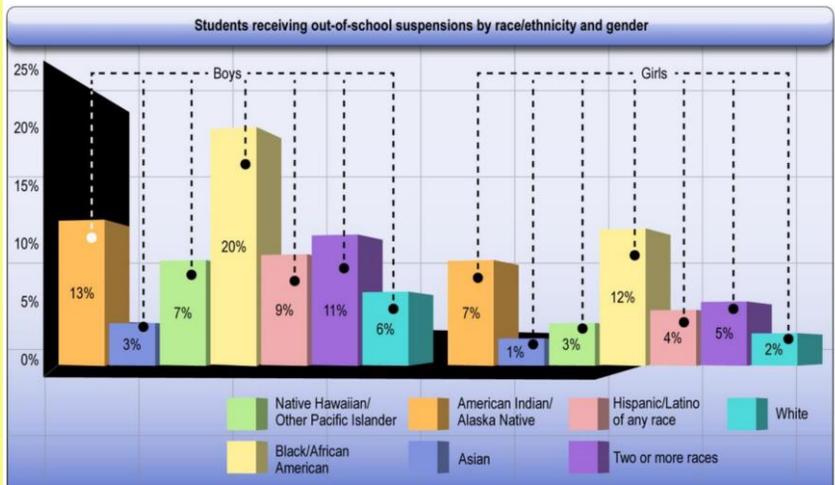
Identified compliance concerns:

- Underprepared professionals referring minority students, but not white students, for academic remediation and retention.
- Despite similarities in circumstances, i.e. the lack of progress in the general education classroom, LEP and other students' lack of experiential/ cultural background, poverty, language proficiency or difficulty with academic English had mistakenly led to low expectations for this student population (NEA, 2015).

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Out-of-school suspensions, by race/ethnicity and gender

Black boys and girls have the highest out of school suspension rates compared to non blacks.



NOTE: Data reflects 99% of CRDC schools and a total of 290,000 American Indian/Alaska Native females, 300,000 American Indian/Alaska Native males, 1.1 million Asian males, 1.2 million Asian females, 120,000 Native Hawaiian/Other Pacific Islander males and females, 3.7 million black females, 3.8 million black males, 5.6 million Hispanic females, 5.9 million Hispanic males, 630,000 males of two or more races, 640,000 females of two or more races, 12 million white males, and 12 million white females.

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How are we doing in Illinois?

Why is this important?

- Students are missing important instructional time
- May be only seen as emotionally disturbed or behaviorally disordered
- We may miss root causes of their difficulties
- We may not be where or understand our own lack of social justice thinking.

Table 1-A. Out-of-school suspensions of male students by race/ethnicity, disability, and state: 2011-12

State	American Indian/Alaska Native	Asian	Native Hawaiian/Other Pacific Islander	Black/African American	Hispanic/Latino of any race	Two or more races	White
UNITED STATES	13%	3%	7%	20%	9%	11%	6%
Alabama	11%	4%	7%	22%	7%	13%	8%
Alaska	13%	4%	11%	15%	8%	8%	6%
Arizona	15%	5%	10%	19%	10%	16%	7%
Arkansas	8%	5%	11%	24%	8%	8%	8%
California	17%	4%	11%	21%	9%	9%	8%
Colorado	16%	5%	8%	17%	10%	11%	6%
Connecticut	10%	2%	8%	16%	11%	9%	3%
Delaware	12%	5%	12%	24%	13%	16%	9%
District Of Columbia	1%	3%	0%	21%	8%	4%	2%
Florida	17%	4%	10%	26%	16%	19%	12%
Georgia	12%	4%	9%	19%	8%	13%	7%
Hawaii	‡	‡	‡	‡	‡	‡	‡
Idaho	11%	3%	8%	14%	7%	6%	5%
Illinois	9%	2%	7%	19%	7%	10%	5%

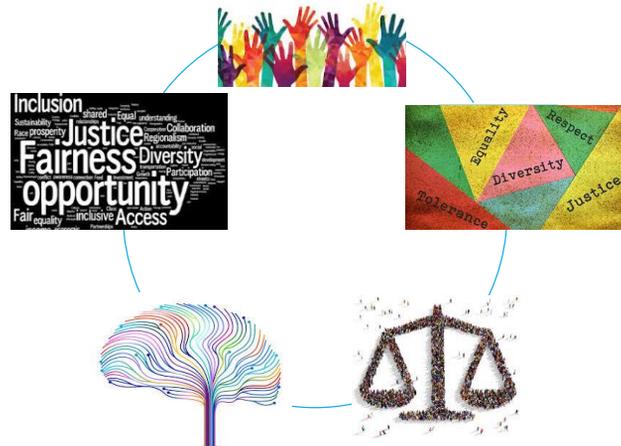
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Urgency

- We must ensure non-discriminatory diagnostic evaluation methods that provide valid data for diagnosis and interventions for the diverse populations we serve
- Diverse populations with special education needs are victims of services and related inequities (Shiffer et al. 2011)
- legislation does not necessary consider the needs of CLDL (Hacker et. al, 2015).

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Social Justice



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Definitions of Social Justice

- ✓ “A state or doctrine of egalitarianism (*Egalitarianism defined as*
 - ✓ 1: a belief in human **equality** especially with respect to **social, political, and economic** affairs;
 - ✓ 2: a social philosophy advocating the **removal of inequalities among people**)” – Merriam-Webster Dictionary
- ✓ As applied to Psychological Assessment, we define Social Justice as providing equal opportunity for students to be assessed in a manner that is fair, nondiscriminatory, that ultimately benefits them through thoughtful interpretation of test results, and that leads to appropriate interventions regardless of language or cultural differences.

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Definition of Social Justice

- The concept of Social Justice is based on the idea that all members of a society should have equal rights and access to opportunities.
- The ethical principles of the American Psychological Association (2017) even require psychologists to ensure that their work **benefits** and **respects the rights of all people**, regardless of age, gender, gender identity, race, ethnicity, culture, national origin, religion, sexual orientation, disability, language, or socioeconomic status.

American Psychological Association. (2017). Ethical principles of psychologists and code of conduct (2002, Amended June 1, 2010 and January 1, 2017).

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Social Justice, Education & Psychology

Social Justice is not easily defined, but is associated in education with the idea that all individuals and groups must be treated with fairness and respect and that all are entitled to the resources and benefits that the school has to offer. (North, 2006)



Social Justice is an advocacy-related construct that includes three specific, but not always distinct, ecological system qualities that promote educational success and psychological well-being: *access* to necessary and appropriate resources, experiences of being treated with *respect* and *fairness* (emphasis in original, Sander et al., 2011)

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Social Justice & Cognitive Assessment

- As it pertains to the assessment of intelligence:
 - ✓ Scores derived from a measures of intelligence should be practical.
 - ✓ An empirical guide for identifying difficulties a child may have.
 - ✓ Whatever the difficulties the student is found to have, the emphasis is on improvement though specialized intervention.
 - ✓ Low scores should not be treated as the student is incapable of more.

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Equality



The assumption is that **everyone benefits from the same supports**. This is equal treatment.

Equity



Everyone gets the supports they need (this is the concept of "affirmative action"), thus producing equity.

Justice



All 3 can see the game without supports or accommodations because **the cause(s) of the inequity was addressed**. The systemic barrier has been removed.

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Social Justice, Education & Psychology

For Psychologists, the phrase *Social Justice* is a call to reflect on our practice for ourselves and our profession. (Clare, 2013)



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Reflection

Requires us to look at the positive and negative aspects of our practice.

It requires that we acknowledge things that may make us uncomfortable.

Urges us to change what we do, once we recognize what justice requires us to do.

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Social Justice- Education- School Psychology

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James' teacher- Ms. Bolos

Mrs. Bolos is the 1st grade teacher. She has worked at Lake for 12 years and is considered the "strongest" teacher on the 1st grade team.

In the 12 years that Mrs. Bolos has worked at Lake, the school has gone through a large demographic shift. More students of color, and lower economic status are there than ever before. Parents are less involved than they were in previous years.

Ms. Bolos wants to refer James for a Special Education Evaluation. She says Robert is very disruptive in class, and he is behind academically.

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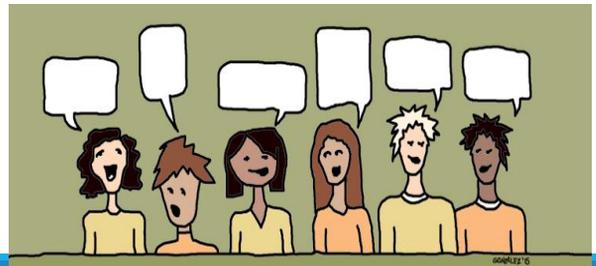
The Pre-Referral Process

- The Student Support Team reviews James's file and notes that he also had behavioral challenges last year. They meet with James's mother, Ms. Johnson, and suggest to her that perhaps he should be evaluated for Special Education.
- Mother refuses. She states that she doesn't think the teacher likes her son, and doesn't trust anything she says. She instead requests that he be moved to another classroom.
- The principal indicates that it is not possible to move James because the other two 1st grade classes have circumstances that are prohibitive.

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Core Group Discussion

- Organizer – Have your group discuss the case this situation
- Coach – Help the group discuss the case
 - *How common is this scenario?*
 - *What other things do you want to know?*
 - *What next steps would you advise the team to take*
- Recorder – Keep notes
- Energizer – Focus the group !



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The Case of James



1.

James begins to cut class, multiple times per day.



When the teacher notices that he has left the room, she calls the office.



In an attempt to address this, the principal invites Robert to “visit” the Resource Room when he needs a break.



Ms. Buss, the Special Education teacher allows James to sit in on her small groups and provides work for him.



James enjoys his time with Mrs. Buss, and his “visits” become more frequent.

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Pre-referral Interventions

You observe that James is a very active boy. He seems to be constantly in motion while in the classroom. He is easily frustrated and shouts out when he wants or needs something. Mrs. Bolos largely ignores James, unless he engages physically with another student.

When you engaged James in the class activity one on one, he seemed invested and enjoyed working with her.

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Pre-referral Interventions

You create a Behavior Intervention Plan for James and ask Mrs. Bolos to take data on Robert during class, and to record when he elopes.



You follow up with another classroom observation. In it she notices that Mrs. Bolos is not following the plan. She continues to ignore James and does not give any him positive feedback when he is compliant or participating in class activities.



You asks to see the compliance checklist that she is supposed to fill out during the day. Mrs. Bolos states that the checklist is too much for her to keep track of while she is teaching.

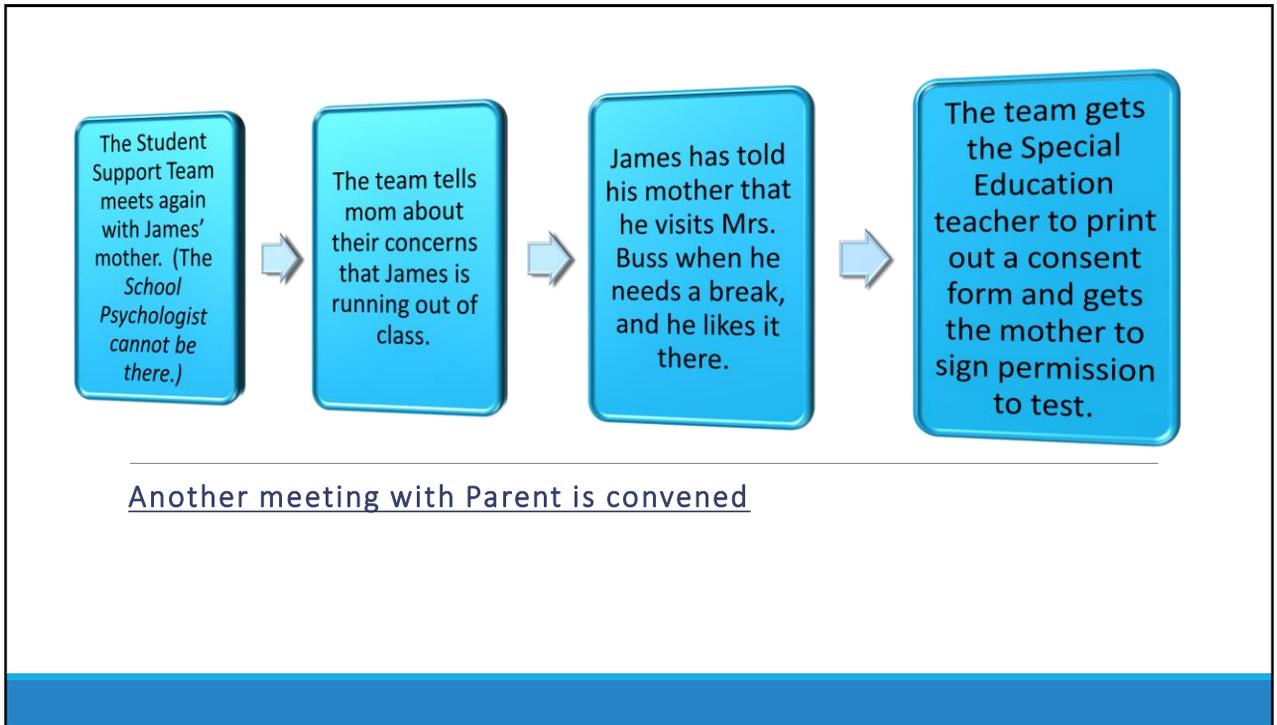
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Core Group Discussion



- How often do you think this happens in classrooms/schools?
- What factors do you think are contributing to this student's behaviors?
- What recommendations would you make to the teacher?
- *Take a few minutes to talk with colleagues about what you have learned so far.*

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Core Group Discussion

Organizer – Have your group discuss...

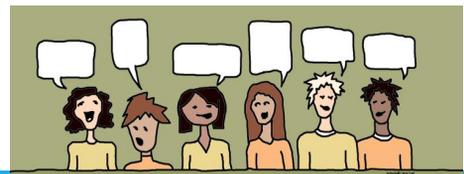
Coach – Help the group decide what to do

Recorder – Keep notes on the conversation

Energizer – Focus the group !

Take a few minutes to discuss what systems are in place and how they are functioning.

Identify what the next steps should be.



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Evaluation

- 

You find out the next day that you now have **much less** than 60 days school days to complete the evaluation.
- 

You call Ms. Johnson to find out from her what her expectations are. She says that she wants to know how James is learning, and how she can help him at home.
- 

Ms. Johnson is also adamant that Mrs. Bolos not be involved in the evaluation at all. She emphasizes that she doesn't think the classroom teacher cares for James and does not trust anything she says.
- 

She does give her permission for Mrs. Buss to fill out rating scales for James since he says she is nice to him.

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Evaluation

You go to Mrs. Bolos to get current data on James' academic achievement. After nervously looking through James' desk for work samples, she asks you to come back later, or let her email you with the information



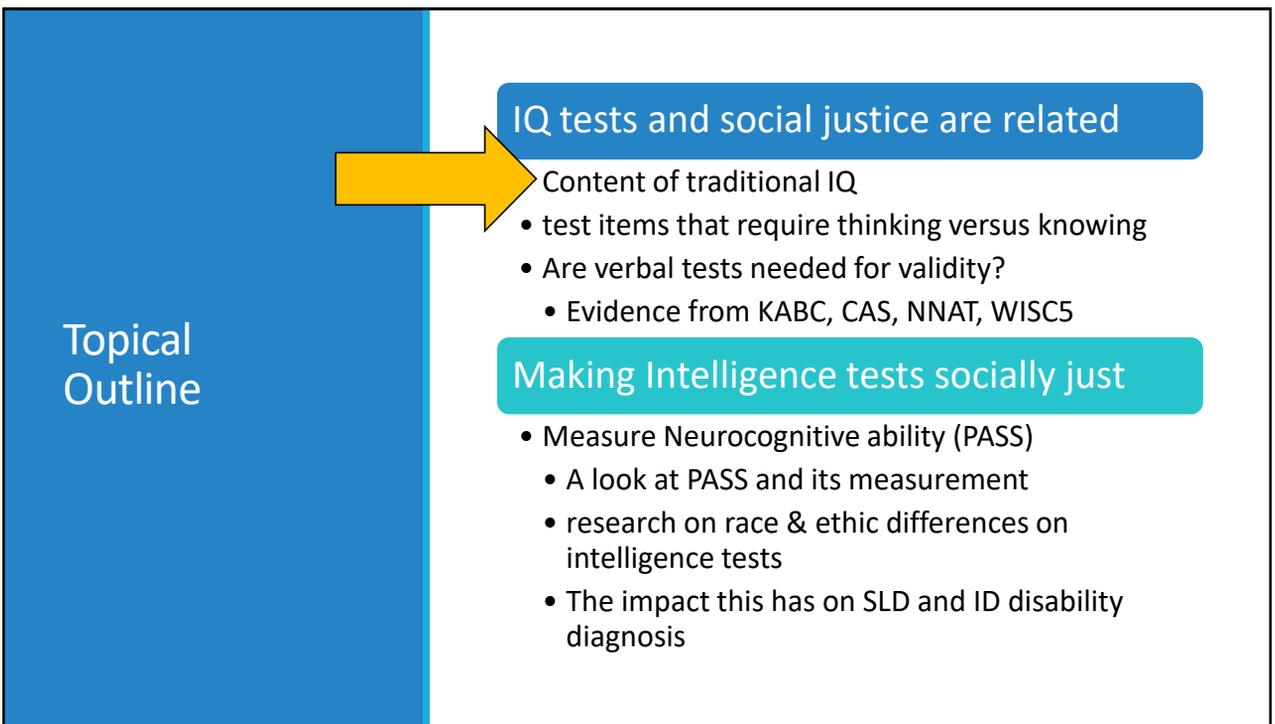
You then go to Mrs. Buss. She tells you that James knows his letters, and most sounds, but he struggles to blend sounds, and confuses long and short vowel sounds. She says that in math, he can count but struggles adding on.



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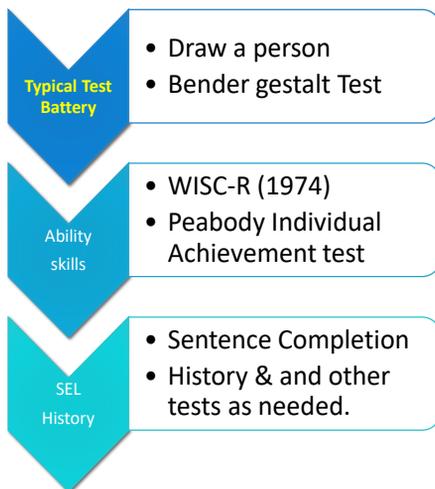


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Traditional IQ and Achievement Tests



1983 Allen Field Elementary School

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Traditional IQ and Achievement Tests

- We noticed that parts of the WISC we were administering was VERY similar to parts of the achievement tests
 - 1975 Charles Champagne Elementary, Bethpage, NY
- HOW DOES THAT MAKE SENSE?
- WHY DO WE HAVE THIS PROBLEM?

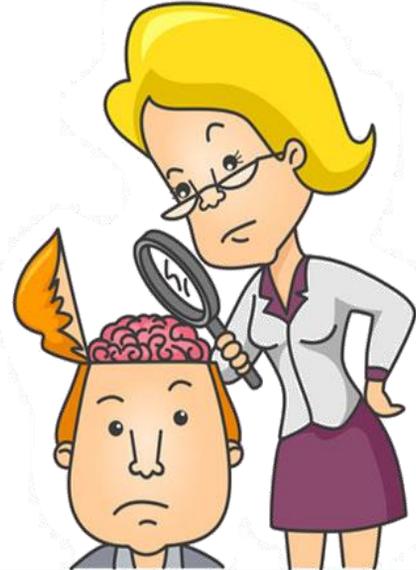


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Why do we measure IQ the way we do?

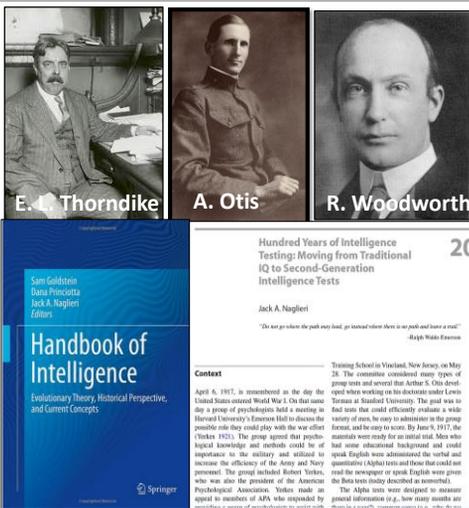
The History of IQ tests



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



- 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

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On July 20, 1917 they concluded that the Army Alpha and Beta tests could

- “aid in segregating and eliminating the mentally incompetent, classify men according to their mental ability; and assist in selecting competent men for responsible positions” (p. 19, Yerkes, 1921).

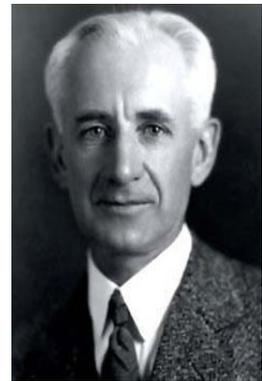
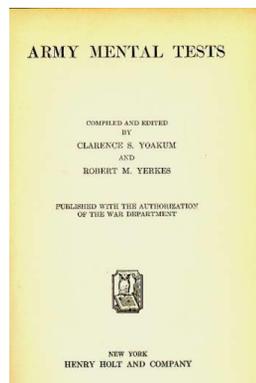
Thus, **July 20, 1917** is the birth date of the verbal, quantitative, nonverbal IQ test format -- **Traditional groups and individually administered IQ tests.**

- **We have had more than 100 years of this approach to intelligence testing**

Origins of Traditional IQ

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From Alpha/Beta to Wechsler IQ

Yoakum & Yerkes (1920) Summarized The Methods Used By The Military

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From Alpha/Beta to Wechsler IQ

➤ Army Alpha

- Synonym- Antonym
- Disarranged Sentences
- Number Series
- Arithmetic Problems
- Analogies
- Information

Verbal & Quantitative questions demand knowledge

➤ Army Beta

- Maze
- Cube Imitation
- Cube Construction
- Digit Symbol
- Pictorial Completion
- Geometrical Construction

Nonverbal typically demand much less knowledge

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Army Mental Tests - Vocabulary (WISC-V)

Test J, *vocabulary*.

Materials.—Accompanying five series of words.

Directions.—Place the list so that subject may see the words and pronounce them if he wishes. If a word is pronounced incorrectly, examiner should give the correct pronunciation. Formula: "What does the word mean?" If subject hesitates or seems to think that he must give a formal definition, examiner says, "It doesn't matter how you say it. All I care for is to find out whether you know what the word means. Tell me the meaning any way you want to express it." Subject is encouraged as liberally as necessary.

Ordinarily it will not be necessary to secure responses to all of the 40 words in a series, as some will obviously be too hard or too easy for the subject being tested. This is especially true in series 1, the words of which have been graded accurately according to difficulty. In each series, however, the testing should be over a wide enough range to secure an accurate score.

Scoring.—Credit each response as + or -. Occasionally half credits may be given, but in general this should be avoided.

The score is + if the response shows that subject knows at least one approximately correct meaning of the word. It is not necessary that the meaning given be the most common one. The form of definition is disregarded in computation of score, but for clinical purposes it is well to designate especially superior definitions by + +.

Series 1.

1 lecture	11 forfeit	21 conscientious	31 gelatinous
2 guitar	12 majesty	22 philanthropy	32 milksop
3 scorch	13 shrewd	23 exaltation	33 declivity
4 bonfire	14 Mars	24 frustrate	34 irony
5 misuse	15 dilapidated	25 flaunt	35 incrustation

SLIDES BY JACK A. NAGLIERI, PH.D. (JNAGLIERI@GMAIL.COM)

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Army Mental Tests - Arithmetic (WISC-V)

- Disarranged sentences
- Arithmetical reasoning
- Information
- Synonyms, antonyms
- Practical Judgment
- Number series
- Analogies

TEST 2

Get the answers to these examples as quickly as you can.
Use the side of this page to figure on if you need to.

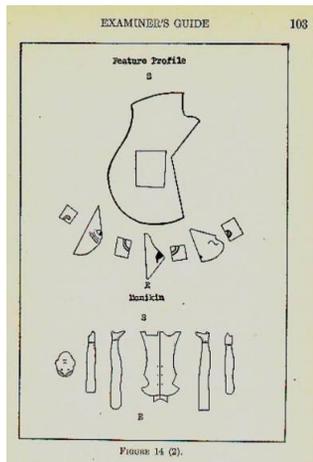
SAMPLES	{ 1 How many are 5 men and 10 men? Answer (15) { 2 If you walk 4 miles an hour for 3 hours, how far do you walk? .. Answer (12)	ARMY MENTAL TESTS
	1 How many are 40 guns and 6 guns? Answer (46)	
	2 If you save \$6 a month for 5 months, how much will you save? Answer (30)	
	3 If 32 men are divided into squads of 8, how many squads will there be? ... Answer (4)	
	4 Mike had 11 cigars. He bought 3 more and then smoked 6. How many cigars did he have left? Answer (8)	
	5 A company advanced 6 miles and retreated 3 miles. How far was it then from its first position? Answer (9)	
	6 How many hours will it take a truck to go 48 miles at the rate of 4 miles an hour? Answer (12)	
	7 How many pencils can you buy for 40 cents at the rate of 2 for 5 cents? ... Answer (16)	
	8 A regiment marched 40 miles in five days. The first day they marched 9 miles, the second day 6 miles, the third 10 miles, the fourth 9 miles. How many miles did they march the last day? Answer (6)	
	9 If you buy 2 packages of tobacco at 8 cents each and a pipe for 55 cents, how much change should you get from a two-dollar bill? Answer (14)	
	10 If it takes 8 men 2 days to dig a 160-foot drain, how many men are needed to dig it in half a day? Answer (32)	

The First IQ TEST: Alpha (Verbal)

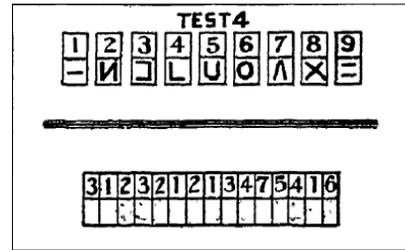
- tobacco** 1. Bull Durham is the name of
- fruit** 2. The Mackintosh Red is a kind of
- typewriter** 3. The Oliver is a
- Mogul** 4. A passenger locomotive type is the
- engineers** 5. Stone & Webster are well know
- Superbas** 6. The Brooklyn Nationals are called
- fabric** 7. Pongee is a
- corn** 8. Country Gentleman is a kind of
- Mckinley** 9. The President during the Spanish War was
- cigarette** 10. Fatima is a make of

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

Army Beta Tests - Digit Symbol & Object Assembly



- Wechsler's Performance tests were taken from the Army Beta
- **BUT WHY were nonverbal test included?**



Test 7.—Digit Symbol

E. shows S. the record sheet, points to blank below 2 in the sample, then to symbol for 2 at top of page, writes in symbol, proceeds in the same way with the other parts of the sample, then gives S. pencil, points to space below 3 in the test, and nods affirmatively.

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1920 Army Testing (Yoakum & Yerkes)

Note there is no mention of measuring verbal and nonverbal intelligences – **it was a social justice issue.**

METHODS AND RESULTS

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Why Beta?

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.

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Topical Outline

IQ tests and social justice are related

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 - Evidence from KABC, CAS, NNAT, WISC5

Making Intelligence tests socially just

- Measure Neurocognitive ability (PASS)
 - A look at PASS and its measurement
 - research on race & ethnic differences on intelligence tests
- The impact this has on SLD and ID disability diagnosis

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Thinking vs Knowing

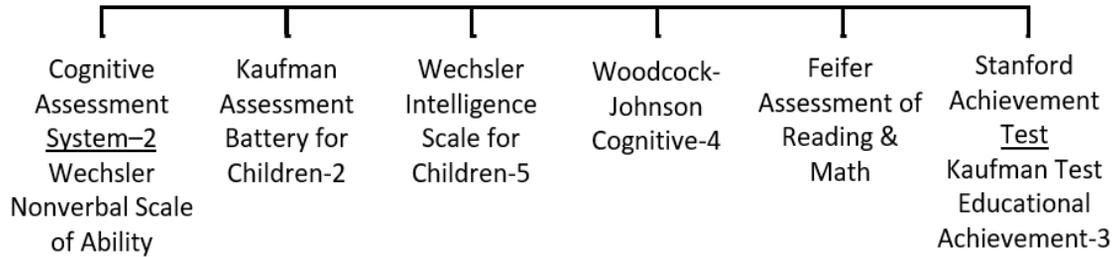
➤ IQ tests that are confounded by knowledge

- WISC-V
 - Verbal Comprehension: Vocabulary, Similarities, Information & Comprehension
 - Fluid Reasoning: Figure Weights, Picture Concepts, Arithmetic
- WJ-IV and Bateria-IV
 - Comprehension Knowledge: Vocabulary & General Information
 - Fluid Reasoning: Number Series & Concept Formation
 - Auditory Processing: Phonological Processing
- K-ABC-II
 - Knowledge / GC: Riddles, Expressive Vocabulary, Verbal Knowledge

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Thinking and Knowing Continuum



- ❖ The obvious connection between educational opportunity and vocabulary and arithmetic subtests was noted by Matarazzo (1972) when he wrote: “a man’s vocabulary is necessarily influenced by his education and cultural opportunities (p. 218)” and when referring to the Arithmetic subtest, “its merits are lessened by the fact that it is influenced by education (p. 203)”. The impact of education on intelligence tests was clearly understood yet our interpretations of these scores have not adequately recognized the threat to validity.

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Intelligence Tests Should Measure Thinking not Knowing

- What does the student have to **know** to complete a task?
 - *This is dependent on educational opportunity (e.g., Vocabulary, Arithmetic, phonological skills, etc.)*



How does the student have to **think** to complete a task?

This is dependent on the brain's neurocognitive processes

I must follow a sequence



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Intelligence Tests and Prediction

- Intelligence tests are one of the primary tools for identifying children with Intellectual disability, specific learning disabilities, and giftedness
 - The goal is to determine if there is a cognitive explanation for academic successes or failure
- The correlations between intelligence and achievement tests and the profiles of scores these tests measure tell us the value these test scores have for both predication and explanation of specific academic success and failure

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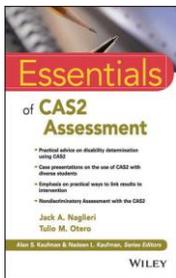
67

Correlation with Achievement

- When studying the relationships between intelligence tests and achievement there is a confounding factor...
 - Traditional tests have achievement in them !
 - That is called criterion contamination
- Measures of neurocognitive processes do not have academic content
- This is good for fair assessment, but does it limit the power of processing scores to predict achievement?

Correlations: We can do better

Average correlations between IQ Scales with total achievement scores from *Essentials of CAS2 Assessment* Naglieri & Otero (2017)



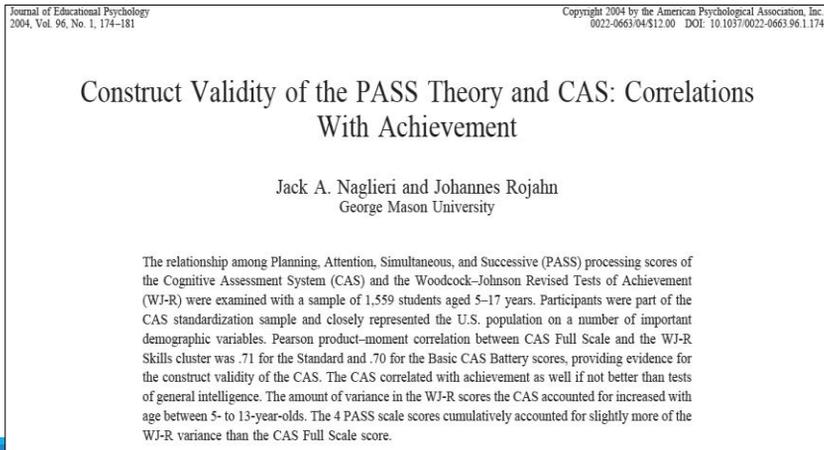
Correlations Between Ability and Achievement			Average Correlation	
			All Scales	Scales without achievement
WISC-V	Verbal Comprehension	.74	.53	.47
WIAT-III N = 201	Visual Spatial	.46		
	Fluid Reasoning	.40		
	Working Memory	.63		
	Processing Speed	.34		
WJ-IV COG	Comprehension Knowledge	.50	.54	.50
WJ-IV ACH N = 825	Fluid Reasoning	.71		
	Auditory Processing	.52		
	Short Term Working Memory	.55		
	Cognitive Processing Speed	.55		
	Long-Term Retrieval	.43		
	Visual Processing	.45		
KABC	Sequential/Gsm	.43	.53	.48
WJ-III ACH N = 167	Simultaneous/Gv	.41		
	Learning/Glr	.50		
	Planning/Gf	.59		
CAS	Knowledge/GC	.70	.59	
	WJ-III ACH N=1,600	Planning		.57
	Simultaneous	.67		
	Attention	.50		
	Successive	.60		

Note: WJ-IV Scales Comp-Know= Vocabulary and General Information; Fluid Reasoning = Number Series and Concept Formation; Auditory Processing = Phonological processing.

Note: All correlations are reported in the ability tests' manuals. Values were averaged within each ability test using Fisher z transformations.

Prediction of Achievement

- Correlation of PASS with achievement = **.71**



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Myth of Verbal IQ - Conclusions

- The lack of a clear distinction between ability and achievement tests has corrupted the very concept of “verbal ability”
- A child who does not have an adequately enriched educational experience (ELL, SLD, etc.) will be at disadvantage when assessed with so-called Verbal and Quantitative reasoning “ability” tests
- SOLUTION ? **Reinvent intelligence**

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Core Group Activity

- **O**rganizer – Have the group discuss this question: “How do you feel about what was just presented?”
- **C**oach – guide the discussion so that the group arrives at an answer to the question
- **R**eporter – record and report to the group
- **E**nergizer – keep the discussion going !



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Topical Outline

IQ tests and social justice are related

- Content of traditional IQ
- test items that require thinking versus knowing
- Are verbal tests needed for validity?
 - Evidence from KABC, CAS, NNAT, WISC5

Making Intelligence tests socially just

- Measure Neurocognitive ability (PASS)
 - A look at PASS and its measurement
 - research on race & ethnic differences on intelligence tests
 - The impact this has on SLD and ID disability diagnosis

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How Psychometric Bias is Studied (e.g., Jensen's Bias in Mental Tests)

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

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Differences in Mean Scores = Impact

- According to the *Standards for Educational and Psychological Testing* (AERA, APA, NCME, 2014), **equitable assessment** provides examinees *an equal opportunity to display one's ability* and ... a fair chance to achieve the same level as others with equal ability on a construct being measured.
- The Standards also remind us that if a person has had limited opportunities to learn the content in a test of intelligence, *that test may be considered unfair* if it penalizes students for not knowing the answers **even if the norming data do not demonstrate test bias.**

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Test Validity and Social Justice

Validity is an overall evaluative judgment of the degree to which empirical evidence and theoretical rationales support the adequacy ... *of interpretations* ... based on test scores (Messick, 1989).

Validity is not a property of the test or assessment as such, but rather of the *meaning* of the test scores.

A study of "Consequential validity" evaluates the value of the implications of score interpretations as well as the actual and potential consequences of test use; especially in regard to sources of invalidity related to issues of bias, fairness, and distributive justice (Messick, 1980, 1989)."

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Options for Fair Assessment

Nonverbal tests are free of knowledge and are fine for group testing, for example, for gifted children.

Do such test more equitably evaluate diverse populations?

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Nonverbal Testing & Gifted Identification

- 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

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

David Card^{a,1} and Laura Giuliano^{b,1}

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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.

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.”

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A Nonverbal Test Solution

- In Broward County Florida about 50% of its students are black or Hispanic but just 28% students gifted were black or Hispanic.
 - Under that system, the district had relied on teachers and parents to make referrals.
- In 2006, in an effort to reduce that disparity, Broward County introduced a universal screening program, requiring that all second graders take a nonverbal test (Naglieri Nonverbal Ability Test, 1997).

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Card & Giuliano (2017)

www.pnas.org/cgi/doi/10.1073/pnas.1605043113

- The number of Hispanic and Black students increased considerably as did the numbers of students who were in poverty
- When Broward County suspended universal screening due to budget cuts racial and ethnic disparities re-emerged, as large as they were before.

➤ Effects of giving NNAT2 to all students in years 2006 and 2007 (N = 79,650)

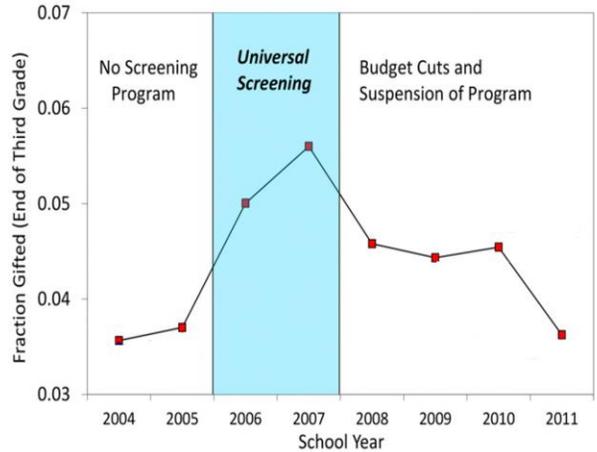


Fig. 1. Fraction gifted by end of third grade,

Race & Ethnic Differences on NNAT

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

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1040-3596/00/\$12.00 DOI: 10.1037/1040-3596.12.3.328

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.

Accurate assessment of intelligence for people from diverse cultural and linguistic backgrounds has been a topic of great debate and interest for some time (Sattler, 1988). To effectively evaluate diverse populations, researchers have widely used tests that comprise nonverbal, geometric designs arranged in a progressive matrix because they are considered culturally reduced in their content (Jensen, 1980; Naglieri & Prewett, 1990; Sattler, 1988). For ex-

as psychometric issues such as internal and test-retest reliability (Jensen, 1980; Naglieri, 1985a, 1985b; Naglieri & Prewett, 1990; Nicholson, 1989). In response to these needs, other progressive matrix tests have become available. This includes the Test of Nonverbal Intelligence (Brown, Sherbenou, & Johnson, 1990), the Matrix Analogies Test—Short Form (MAT-SF; Naglieri, 1985b) and Expanded Form (MAT-EF; Naglieri, 1985a), the Naglieri

	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	466	103.9	0.3

Does the NNAT work for all groups?

- Goal: to examine the differential hit rates of children identified using NNAT scores
- 19,210 children from NNAT normative sample K to 12
- Cumulative frequency distributions were obtained for White (n = 14,316) , Black (n = 2,880), and Hispanic (n = 2, 014) samples
- .

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

GIFTED IDENTIFICATION

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.

relations to achievement provided by Naglieri and Ronning (2000a, 2000b) to include an important examination of the differential rates of identification for diverse groups. These results are similar to previous studies of the NNAT and its

quently, provide access to gifted education services. The primary difference between the NNAT and other group ability tests is that the latter typically include verbal, quantitative, as well as nonverbal tests. Some researchers have

Does the NNAT work for ELL students?

Psychological Assessment
2004, Vol. 18, No. 1, 81–84

Copyright 2004 by the American Psychological Association, Inc.
1040-3590/04/\$12.00 DOI: 10.1037/1040-3590.18.1.81

BRIEF REPORTS

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

Jack A. Naglieri
George Mason University

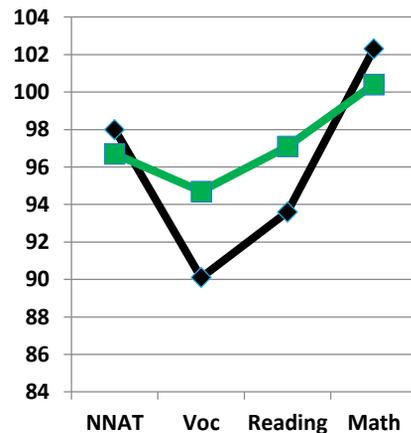
Ashley L. Booth
University of Virginia

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 ($N = 27,620$) 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 (Yokum & Yerkes, 1920). The

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, *yielding small race and ethnic group differences.*



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Nonverbal Tests for Group Screening

- So called “nonverbal” tests of general ability can be used for equitable assessment on a group basis
- BUT a nonverbal test is too limited for comprehensive intellectual assessment especially for eligibility determination.
- Socially just comprehensive assessment requires a major shift toward tests that are designed to measure BRAIN FUNCTION rather than those based on the US Army Alpha and Beta

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Illinois School District U-46

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

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

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

))
Plaintiffs,)) No. 05 C 0760
v.))
)) Judge Robert W. Gettleman
BOARD OF EDUCATION FOR ILLINOIS))
SCHOOL DISTRICT U-46.))
))
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

The Court's decision renewed the *Brown v. Board of Education* (1954) principle that 'separate is inherently unequal'.

... The court finds the District's method of identifying gifted Minority Students was flawed and resulted in an obvious disparate impact on those students by separating them from their gifted White peers.... By singling out most[ly] all Hispanic students for the segregated SET/SWAS program, the District deprived these children of that educational opportunity based on their ethnicity (p. 27).

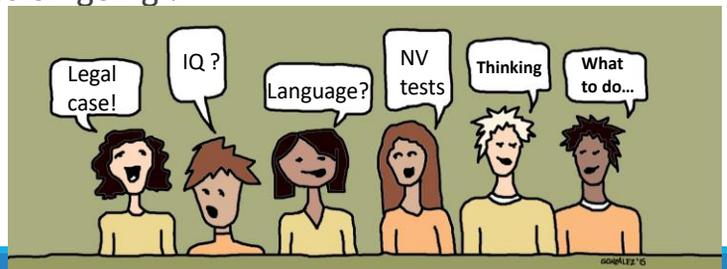
Judge Gettleman found discrimination

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).

Judge Gettleman's Decision

Core Group Activity

- **Organizer** – Have the group discuss this question: “What are you thoughts about these research and legal findings?”
- **Coach** – guide the discussion so that the group arrives at an answer to the question
- **Reporter** – record and report to the group
- **Energizer** – keep the discussion going !



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A Shift from
Traditional To
Second
Generation
Intelligence Tests

Wechsler



**Kaufman Assessment
Battery for Children**



**Cognitive Assessment
System**

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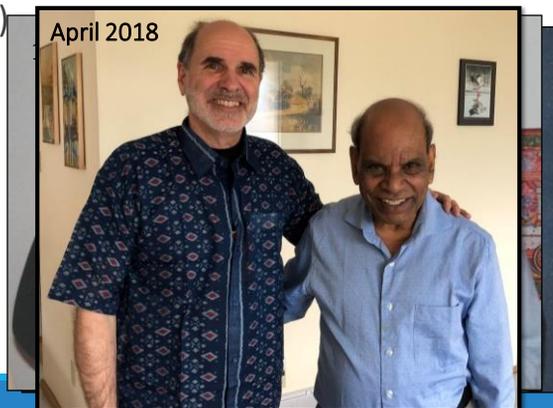
Neurocognitive function

- Luria theorized that human cognitive functions can be conceptualized within a framework of three separate but related brain systems that provide four basic psychological processes.
- The three brain systems are referred to as “**functional units**” because the neurocognitive mechanisms work in separate but interrelated systems.
- Recent neuroscience research has found Cognition and behavior *are a product of functional brain networks.*

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Intelligence as Neurocognitive Functions

- In Das and Naglieri’s first meeting (February 11, 1984) they proposed that intelligence was better REinvented as neurocognitive processes and began development of the **Cognitive Assessment System** (Naglieri & Das, 1997)
- They conceptualized intelligence as Planning, Attention, Simultaneous, and Successive (PASS) neurocognitive processes.



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Neuropsychological Correlates of PASS

Naglieri, J. A., & Otero, T. M. (2018). Redefining Intelligence as the PASS Theory of Neurocognitive Processes. In Flanagan, D. P., & Harrison, P. L. (Eds.), *Contemporary intellectual assessment: Theories, tests, and issues* (4th ed.). New York, NY: Guilford Press.

CHAPTER 6

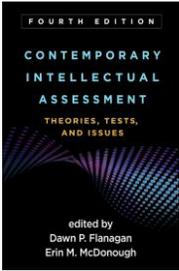
Redefining Intelligence with the Planning, Attention, Simultaneous, and Successive Theory of Neurocognitive Processes

Jack A. Naglieri
Tulio M. Otero

Practitioners and test authors have become increasingly conscious of the need for theory-based intelligence tests. Although several theories of intelligence have been attached to traditional ability tests such as the Wechsler scales (Flacker & Esping, 2014), one theory, first described by Das, Kirby, and Jarman (1979), was used explicitly to develop a new way to construct an intelligence test. In 1997, Naglieri and Das (1997a) published the Cognitive Assessment System (CAS), which was based on a neurocognitive theory called planning, attention, simultaneous, and successive (PASS) processing. These authors argued that a neurocognitive theory of intelligence provides the foundation necessary for test construction and is equally important for test interpretation. They also suggested

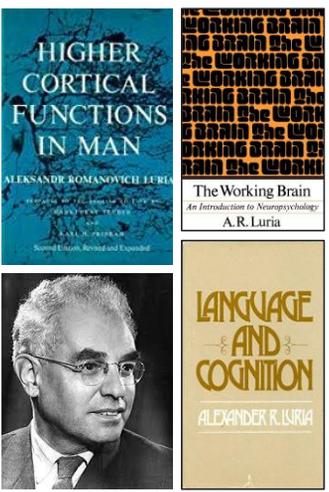
the four PASS processes. PASS theory has been most recently operationalized in the Cognitive Assessment System—Second Edition (CAS2; Naglieri, Das, & Goldstein, 2014a), the CAS2: Expanded (Naglieri, Moreno, & Cron, 2017), the CAS2: Brief (Naglieri, Das, & Goldstein, 2014b), and the CAS2: Rating Scale (Naglieri, Das, & Goldstein, 2014c). We describe these measures comprehensively in Chapter 15 of this book. In this chapter, we focus on the PASS theory upon which all of these measures are based.

The PASS theory and the CAS2 provide a neurocognitive perspective on ability that differs from that of traditional batteries (those including, in part, subtests requiring verbal and quantitative knowledge). These batteries have been used since



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PASS Neurocognitive Theory



- **P**lanning = THINKING ABOUT HOW YOU DO WHAT YOU DECIDE TO DO
 - **A**ttention = BEING ALERT AND RESISTING DISTRACTIONS
 - **S**imultaneous = GETTING THE BIG PICTURE
 - **S**uccessive = FOLLOWING A SEQUENCE
- PASS** = 'basic psychological processes'

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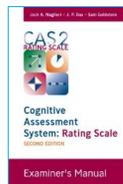
PASS Comprehensive System

(Naglieri, Das, & Goldstein, 2014)

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

CAS2 Rating Scale
(4 subtests)

Total Score
 Planning
 Simultaneous
 Attention
 Successive



CAS2 Brief
(4 subtests)

Total Score
 Planning
 Simultaneous
 Attention
 Successive



CAS2 Core
(8 subtests)

Full Scale
 Planning
 Simultaneous
 Attention
 Successive



CAS2 Extended
(12 subtests)

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

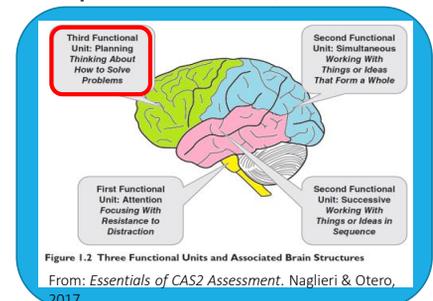


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PASS Theory: Planning

- Planning is a term used to describe a neurocognitive function similar to metacognition and executive function
- Planning is needed for setting goals, making decisions, predicting the outcome of one's own and others actions, impulse control, strategy use and retrieval of knowledge
- Planning helps us make decisions about how to solve any kind of a problem from academics to social situations and life in general



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CAS2: Rating Scale Planning

Directions for Items 1–10. These questions ask how well the child or adolescent decides how to do things to achieve a goal. They also ask how well a child or adolescent thinks before acting and avoids impulsivity. Please rate how well the child or adolescent creates plans and strategies to solve problems.

During the past month, how often did the child or adolescent . . .

	Never	Rarely	Sometimes	Frequently	Always
1. produce a well-written sentence or a story?	0	1	2	3	4
2. evaluate his or her own actions?	0	1	2	3	4
3. produce several ways to solve a problem?	0	1	2	3	4
4. have many ideas about how to do things?	0	1	2	3	4
5. have a good idea about how to complete a task?	0	1	2	3	4
6. solve a problem with a new solution when the old one did not work?	0	1	2	3	4
7. use information from many sources when doing work?	0	1	2	3	4
8. effectively solve new problems?	0	1	2	3	4
9. have well-described goals?	0	1	2	3	4
10. consider new ways to finish a task?	0	1	2	3	4

— + — + — + — + — =

Planning Raw Score

Planned Codes Page 1

A	B	C	D	
X	O			
	O	O		
X	X			
O	X			

A	B	C	D	A
X	O	O		
O	O	X	X	

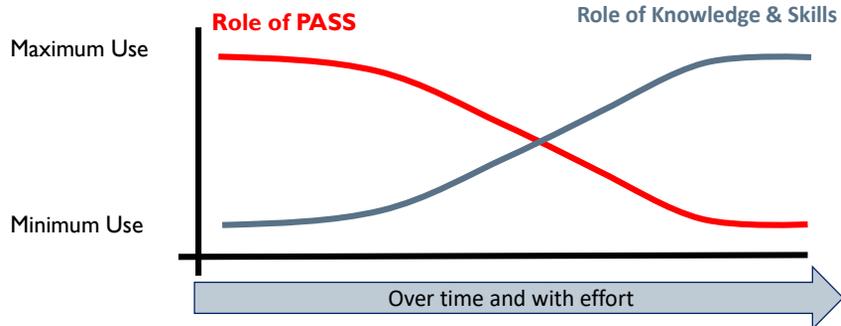
A	B	C	D	A
X	O			
O	O			

A	B	C	D	A
X	O			
O	O			

- ▶ Jack Jr. at age 5
- ▶ Child fills in the codes in the empty boxes
- ▶ After being told the test requirement, examinees are told: “You can do it any way you want”

Planning Learning Curves

- Learning depends upon many factors especially PASS
- When a task is practiced and learned it requires less thinking (PASS) and becomes a skill
- At first, PASS plays a major role in learning



Note: A **skill** is the ability to do something well with minimal effort (thinking)

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Math strategies stimulate thinking

Name _____

Doubles and Near Doubles

double How many are there? near double

$8 + 8 = 16$ $8 + 9 = 17$

Ring the double. Add.

1. $6 + 6 = 12$ $5 + 5 = 10$
 $6 + 7 = 13$ $5 + 6 = 11$

3. $7 + 7 = 14$ $4 + 4 = 8$
 $7 + 8 = 15$ $4 + 5 = 9$

CHECK If you know the sum of $8 + 8$, how can you find $8 + 9$?

three hundred thirty-five 335

This work sheet encourages the child to use strategies (plans) in math such as: "If $8 + 8 = 16$, then $8 + 9$ is 17"

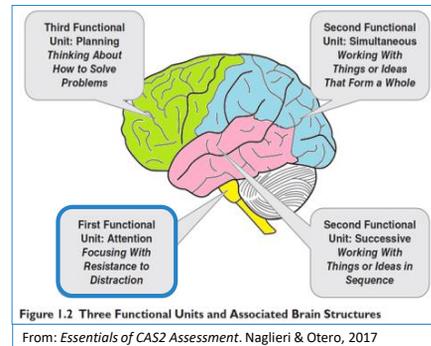
Note to the Teacher: When we teach children skills by helping them use strategies and plans for learning, we are teaching both knowledge and processing. Both are important.

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PASS Theory

- Attention is a basic psychological process we use to
 - selectively attend to some stimuli and ignores others
 - Focus our cognitive activity
 - Selective attention
 - Resistance to distraction
 - Listening, as opposed to hearing



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CAS2: Rating Scale Attention

Directions for Items 21–30. These questions ask how well the child or adolescent pays attention and resists distractions. The questions also ask about how well someone attends to one thing at a time. Please rate how well the child or adolescent pays attention.

During the past month, how often did the child or adolescent . . .

	Never	Rarely	Sometimes	Frequently	Always
21. work well in a noisy area?	0	1	2	3	4
22. stay with one task long enough to complete it?	0	1	2	3	4
23. not allow the actions or conversations of others to interrupt his or her work?	0	1	2	3	4
24. stay on task easily?	0	1	2	3	4
25. concentrate on a task until it was done?	0	1	2	3	4
26. listen carefully?	0	1	2	3	4
27. work without getting distracted?	0	1	2	3	4
28. have a good attention span?	0	1	2	3	4
29. listen to instructions or directions without getting off task?	0	1	2	3	4
30. pay attention in class?	0	1	2	3	4

— + — + — + — + — =
Attention Raw Score

104

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CAS2 Expressive Attention

The child says the color not the word

RED	BLUE	GREEN	YELLOW
YELLOW	GREEN	RED	BLUE
RED	YELLOW	YELLOW	GREEN
BLUE	GREEN	RED	BLUE
GREEN	YELLOW	RED	YELLOW

105

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Expressive Attention - Español

ROJO	AZUL	VERDE	AMARILLO	ROJO
AMARILLO	VERDE	ROJO	AZUL	AMARILLO
ROJO	AMARILLO	AMARILLO	VERDE	AZUL
VERDE	AZUL	VERDE	ROJO	AZUL
VERDE	AMARILLO	ROJO	AMARILLO	VERDE
ROJO	AZUL	ROJO	VERDE	AMARILLO
AZUL	VERDE	AMARILLO	ROJO	AZUL
AMARILLO	AZUL	ROJO	VERDE	AZUL

Conjunto de ítem 6

- An attention test MUST have multi-dimensional stimuli
- The stimulus you have to ignore should be stronger than the one you have to attend to
- The task gets harder over time

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Attention

Selecting the correct answer is difficult because of the similarity of the options which places considerable demands on Attention

11. A 3:15 A.M. B 3:30 P.M. C 3:15 P.M. D 3:15 A.M.



leave school

11. 3:15 P.M.

12. Trent began studying at 5:00 P.M. and finished 1 hour and 22 minutes later. What time did he finish?

A 6:22 A.M. B 5:22 P.M. C 6:10 P.M. D 6:22 P.M.

12. 6:22 P.M.

13. Maura began basketball practice at 3:00 P.M. and finished 50 minutes later. What time did she finish?

A 3:50 P.M. B 3:05 A.M. C 4:05 P.M. D 4:50 A.M.

13. 3:50 P.M.

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Modern Theory: Successive

- **Successive** processing is a basic psychological process we use to manage stimuli in a specific serial order
 - Stimuli form a chain-like progression
 - Word Series
 - Sentence Questions
- **Academic tasks**
 - Decoding words
 - Letter-sound correspondence
 - Phonological tasks
 - Understanding the syntax of sentences
 - Sequence of words, sentences, paragraphs
 - Remembering the sequence of events
 - Learning motor movements

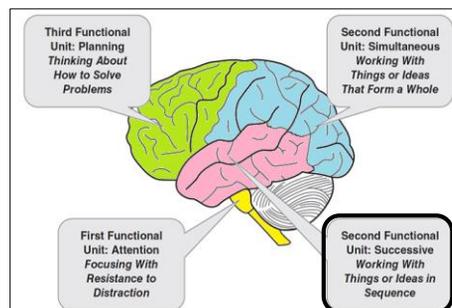


Figure 1.2 Three Functional Units and Associated Brain Structures
From: *Essentials of CAS2 Assessment*. Naglieri & Otero, 2017

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CAS2: Rating Scale Successive

Directions for Items 31–40. These questions ask how well the child or adolescent remembers things in order. The questions ask about working with numbers, words, or ideas in a series. The questions also ask about doing things in a certain order. Please rate how well the child or adolescent works with things in a specific order.

During the past month, how often did the child or adolescent ...

	Never	Rarely	Sometimes	Frequently	Always
31. recall a phone number after hearing it?	0	1	2	3	4
32. remember a list of words?	0	1	2	3	4
33. sound out hard words?	0	1	2	3	4
34. correctly repeat long, new words?	0	1	2	3	4
35. remember how to spell long words after seeing them once?	0	1	2	3	4
36. imitate a long sequence of sounds?	0	1	2	3	4
37. recall a summary of ideas word for word?	0	1	2	3	4
38. repeat long words easily?	0	1	2	3	4
39. repeat sentences easily, even if unsure of their meaning?	0	1	2	3	4
40. follow three to four directions given in order?	0	1	2	3	4

— + — + — + — + — =

Successive Raw Score

109

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Successive Processing Tests

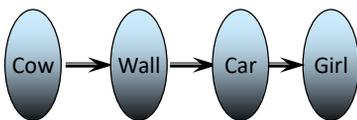
Visual Digit Span

4 3 8 6 1

➤ Sentence Repetition (Ages 5-7)

- Child repeats sentences exactly as stated by the examiner such as:
- The red greened the blue with a yellow.*

Word Series



➤ Sentence Questions (Ages 8 – 18)

- Child answers a question about a statement made by the examiner such as the following:
- The red greened the blue with a yellow. Who got greened?*

110

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Consider this...

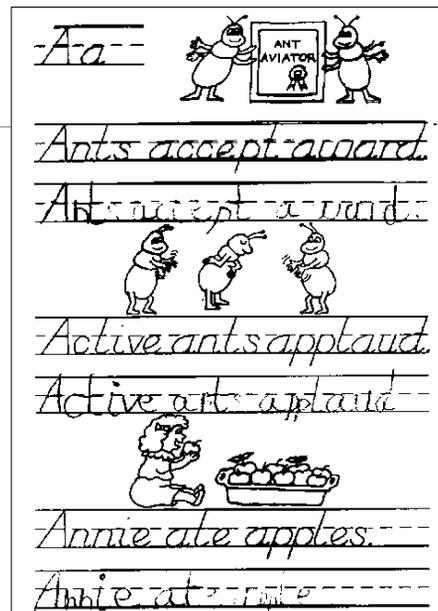
- Even though the tasks were different in content (numbers and words) and modality (auditory and visual), they required the same kind of thinking – Successive processing

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Successive Processing

The sequence of the sounds is emphasized in this work sheet



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Successive Processing is the foundation of Phonemic Skills

“Now I am going to say parts of words. I want you to put the parts together to make a whole word.”

Blending: Advantage

Item	Correct response	# of syllables	Score
ad : van : tage	advantage	3	0 1

From the Feifer Assessment of Reading (2016)

➤ The ability to sequence and sequence multiple sounds together to identify a word in print is critical for reading decoding



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PASS Theory

- **Simultaneous** processing is used to integrate stimuli into groups
 - Each piece must be related to the other
 - Stimuli are seen as a whole
- **Academics:**
 - Reading comprehension
 - geometry
 - math word problems
 - whole language
 - verbal concepts

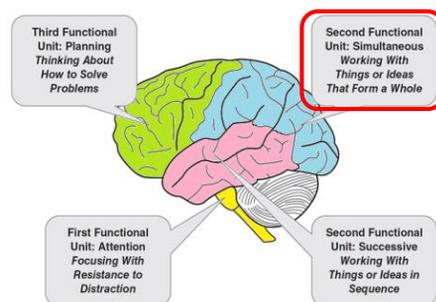


Figure 1.2 Three Functional Units and Associated Brain Structures
From: *Essentials of CAS2 Assessment*. Naglieri & Otero, 2017

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CAS2: Rating Scale Simultaneous

Directions for Items 11–20. These questions ask how well the child or adolescent sees how things go together. They also ask about working with diagrams and understanding how ideas fit together. The questions involve seeing the whole without getting lost in the parts. Please rate how well the child or adolescent visualizes things as a whole.

During the past month, how often did the child or adolescent ...

	Never	Rarely	Sometimes	Frequently	Always
11. like to draw designs?	0	1	2	3	4
12. figure out how parts of a design go together?	0	1	2	3	4
13. classify things into groups correctly?	0	1	2	3	4
14. work well with patterns and designs?	0	1	2	3	4
15. see how objects and ideas are alike?	0	1	2	3	4
16. work well with physical objects?	0	1	2	3	4
17. like to use visual materials?	0	1	2	3	4
18. see the links among several things?	0	1	2	3	4
19. show interest in complex shapes and patterns?	0	1	2	3	4
20. recognize faces easily?	0	1	2	3	4

— + — + — + — + — =

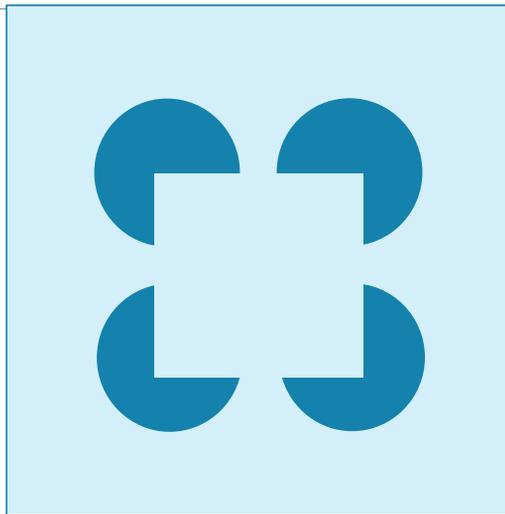
Simultaneous Raw Score

115

115

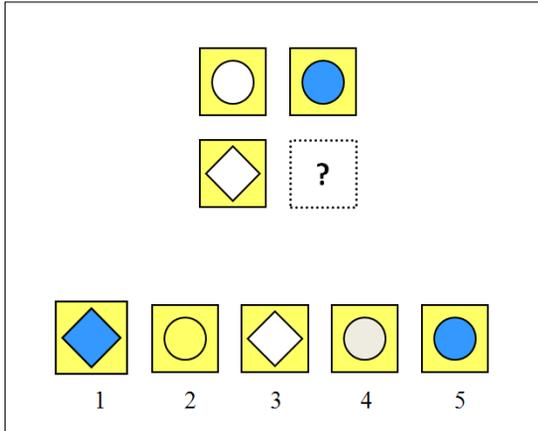
PASS Theory

- **Simultaneous** processing is what Gestalt psychology was based on
- Seeing the whole



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3 is to 6 as 5 is to ___?

Girl is to woman as boy is to _____?

C⁷ is to F as E⁷ is to _____?

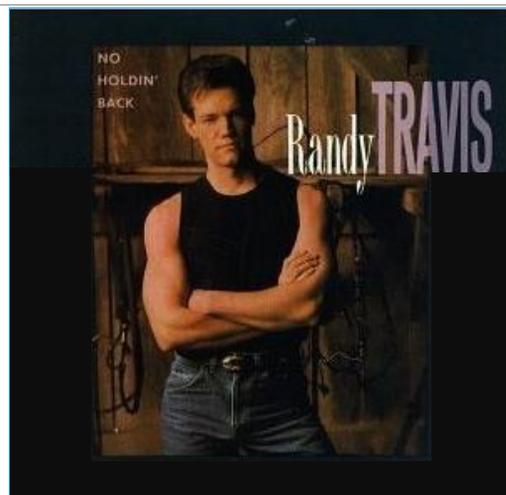
117

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Simultaneous Verbal Task

- Simultaneous processing using verbal content
- Who is this song about?

My momma's daddy
was his oldest son.



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CAS2 Verbal-Spatial Relations

 <p>1</p>	 <p>2</p>	 <p>3</p>
 <p>4</p>	 <p>5</p>	 <p>6</p>
<p>Which picture shows a boy behind a girl?</p>		

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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!

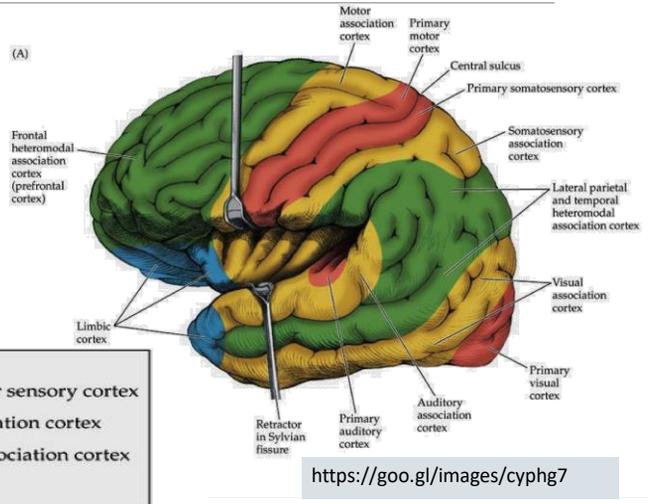
120

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Heteromodal Association Cortex

(Goldberg, 2006)

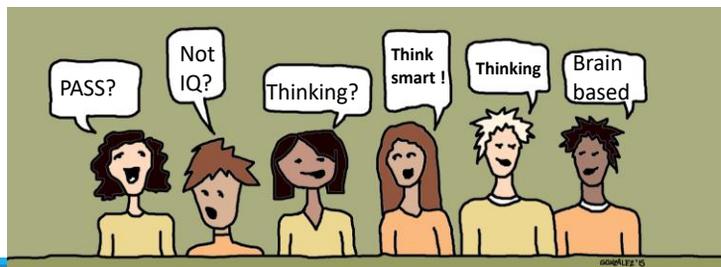
- Our brains *merge stimuli* coming in from the senses (unimodal association cortex) into one stream of information in the **Heteromodal association cortex** (green areas)



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Core Group Activity

- Organizer – Have the group discuss this question: “How is PASS more socially just?”
- Coach – guide the discussion
- Reporter – will record and report to the group
- Energizer – keep the discussion going !



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Topical Outline

IQ tests and social justice are related

- Content of traditional IQ
- test items that require thinking versus knowing
- Are verbal tests needed for validity?
 - Evidence from KABC, CAS, NNAT, WISC5

Making Intelligence tests socially just

- Measure Neurocognitive ability (PASS)
 - A look at PASS and its measurement
 - research on race & ethnic differences on intelligence tests
 - The impact this has on SLD and ID disability diagnosis

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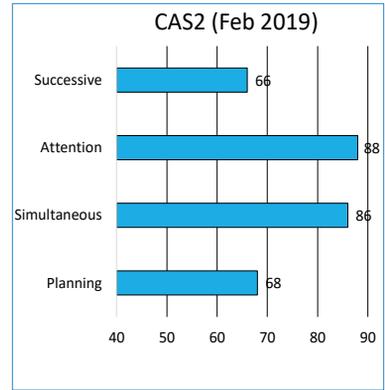
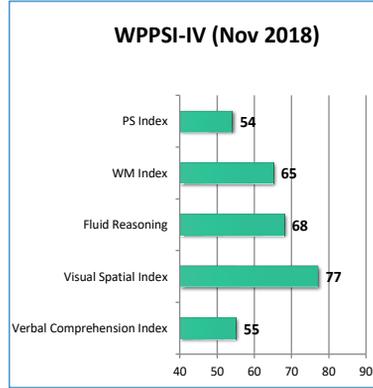
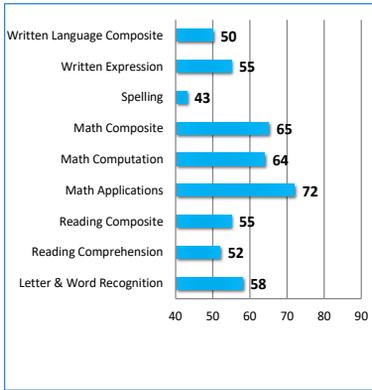
Alexandra: Age 8-1; 2nd Grade Re-evaluation: Concern is student ID?



- ∅ Very Low in Math, Reading and Spelling.
- ∅ Difficulty remembering information, keeping information in order, limited use of strategies.
- ∅ Spend 40% of her day in a cluster classroom with kindergarteners and 1st graders.
- ∅ Has received Sp/L services for two years. History of selective mutism
- ∅ Currently receives services under Developmental Delay.
- ∅ Spanish dominant. Low vocabulary in both English and Spanish

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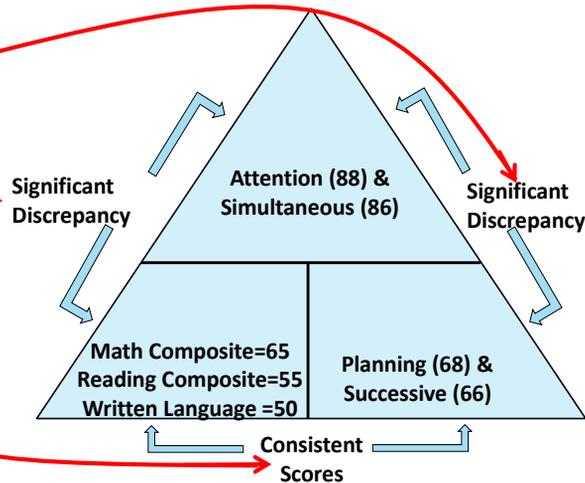
Alexandra Bateria-IV, WPPSI-IV, CAS2



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Alexandra Discrepancy Consistency Model for SLD

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



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Naglieri, Rojahn, Matto (2007)

Hispanic White difference on CAS Full Scale of 4.8 standard score points (matched)

Available online at www.sciencedirect.com

ScienceDirect
Intelligence 35 (2007) 568–579

ELSEVIER INTELLIGENCE

Hispanic and non-Hispanic children's performance on PASS cognitive processes and achievement[☆]

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Received 16 May 2006; received in revised form 6 November 2006; accepted 6 November 2006
Available online 8 January 2007

Abstract

Hispanics have become the largest minority group in the United States. Hispanic children typically come from working class homes with parents who have limited English language skills and educational training. This presents challenges to psychologists who assess these children using traditional IQ tests because of the considerable verbal and academic (e.g., quantitative) content. Some researchers have suggested that intelligence conceptualized on the basis of psychological processes may have utility for assessment of children from culturally and linguistically diverse populations because verbal and quantitative skills are not included. This study examined Hispanic children's performance on the Cognitive Assessment System (CAS; [Naglieri, J.A., and Das, J.P. (1997). Cognitive Assessment System. Itasca, IL: Riverside.] which is based on the Planning, Attention, Simultaneous, and Successive (PASS) theory of intelligence. The scores of Hispanic ($N=244$) and White ($N=1956$) children on the four PASS processes were obtained and the respective correlations between PASS and achievement compared. Three complementary sampling methodologies and data analysis strategies were chosen to compare the Ethnic groups. Sample size was maximized using nationally representative groups and demographic group differences were minimized using smaller matched samples. Small differences

PASS scores – English and Spanish

Bilingual Hispanic Children's Performance on the English and Spanish Versions of the Cognitive Assessment System

School Psychology Quarterly
2007, Vol. 22, No. 3, 432–448

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Brianna DeLauder
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Holly Matto
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This study compared the performance of referred bilingual Hispanic children on the Planning, Attention, Simultaneous, Successive (PASS) theory as measured by English and Spanish versions of the Cognitive Assessment System (CAS; Naglieri & Das, 1997a). The results suggest that students scored similarly on both English and Spanish versions of the CAS. Within each version of the CAS, the bilingual children earned their lowest scores in Successive processing regardless of the language used during test administration. Small mean differences were noted between the means of the English and Spanish versions for the Simultaneous and Successive processing scales; however, mean Full Scale scores were similar. Specific subtests within the Simultaneous and Successive scales were found to contribute to the differences between the English and Spanish versions of the CAS. Comparisons of the children's profiles of cognitive weakness on both versions of the CAS showed that these children performed consistently despite the language difference.

Keywords: bilingual assessment, intelligence, PASS Theory, Cognitive Assessment System, non-biased assessment

Means, SDs, *d*-ratios, Obtained and Correction Correlations Between the English and Spanish Version of the CAS ($N = 55$).

	CAS English		CAS Spanish		<i>d</i> -ratio	Correlations	
	Mean	SD	Mean	SD		Obtained	Corrected
Planning	92.6	13.1	92.6	13.4	.00	.96	.97
Simultaneous	89.0	12.8	93.0	13.7	-.30	.90	.93
Attention	94.8	13.9	95.1	13.9	-.02	.98	.98
Successive	78.0	13.1	83.1	12.6	-.40	.82	.89
Full Scale	84.6	13.6	87.6	13.8	-.22	.96	.97

- Very similar scores in both versions
- >90% agreement between PASS weakness & strengths using English and Spanish CAS

Otero, Gonzales, Naglieri (2013)

- Very similar scores in both versions
- >90% agreement between PASS weakness & strengths using English and Spanish CAS

APPLIED NEUROPSYCHOLOGY: CHILD, 0: 1-9, 2012
Copyright © Taylor & Francis Group, LLC
ISSN: 2162-2965 print/2162-2973 online
DOI: 10.1080/21622965.2012.70547

Psychology Press
Taylor & Francis Group

The Neurocognitive Assessment of Hispanic English-Language Learners With Reading Failure

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Jack A. Naglieri

University of Virginia, Fairfax, Virginia

This study examined the performance of referred Hispanic English-language learners ($N = 40$) on the English and Spanish versions of the *Cognitive Assessment System* (CAS; Naglieri & Das, 1997). The CAS measures basic neuropsychological processes based on the Planning, Attention, Simultaneous, and Successive (PASS) theory (Naglieri & Das, 1997; Naglieri & Otero, 2011c). Full Scale (FS) scores as well as PASS processing scale scores were compared, and no significant differences were found in FS scores or in any of the PASS processes. The CAS FS scores on the English ($M = 86.4, SD = 8.73$) and Spanish ($M = 87.1, SD = 7.94$) versions correlated .94 (uncorrected) and .99 (corrected for range restriction). Students earned their lowest scores in Successive processing regardless of the language in which the test was administered. PASS cognitive profiles were similar on English and Spanish versions of the PASS scales. These findings suggest that students scored similarly on both versions of the CAS and that the CAS may be a useful measure of these four abilities for Hispanic children with underdeveloped English-language proficiency.

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CAS in Italy

Using US norms, Italian sample ($N = 809$) CAS Full Scale was 100.9 and matched US sample ($N = 1,174$) was 100.5 and factorial invariance was found



Psychological Assessment

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1040-3590/12/\$12.00 DOI: 10.1037/a0029828

Multigroup Confirmatory Factor Analysis of U.S. and Italian Children's Performance on the PASS Theory of Intelligence as Measured by the Cognitive Assessment System

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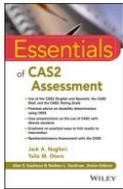
This study examined Italian and U.S. children's performance on the English and Italian versions, respectively, of the *Cognitive Assessment System* (CAS; Naglieri & Conway, 2009; Naglieri & Das, 1997), a test based on a neurocognitive theory of intelligence entitled PASS (Planning, Attention, Simultaneous, and Successive; Naglieri & Das, 1997; Naglieri & Otero, 2011). CAS subtest, PASS scales, and Full Scale scores for Italian ($N = 809$) and U.S. ($N = 1,174$) samples, matched by age and gender, were examined. Multigroup confirmatory factor analysis results supported the configural invariance of the CAS factor structure between Italians and Americans for the 5- to 7-year-old (root-mean-square error of approximation [RMSEA] = .038; 90% confidence interval [CI] = .033, .043; comparative fit index [CFI] = .96) and 8- to 18-year-old (RMSEA = .036; 90% CI = .028, .043; CFI = .97) age groups. The Full Scale standard scores (using the U.S. norms) for the Italian (100.9) and U.S. (100.5) samples were nearly identical. The scores between the samples for the PASS scales were very similar, except for the Attention Scale ($d = 0.26$), where the Italian sample's mean score was slightly higher. Negligible mean differences were found for 9 of the 13 subtest scores, 3 showed small d -ratios (2 in favor of the Italian sample), and 1 was large (in favor of the U.S. sample), but some differences in subtest variances were found. These findings suggest that the PASS theory, as measured by CAS, yields similar mean scores and showed factorial invariance for these samples of Italian and American children, who differ on cultural and linguistic characteristics.

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Race & IQ

- Neurocognitive tests yield smaller differences
- CAS and CAS2 have the smallest differences



Mean Score Differences in Total scores by Race by Intelligence Test.

Traditional IQ tests	
SB-IV (matched samples)	12.6
WISC-V (normative sample)	11.6
WISC-IV (normative sample)	11.5
WJ- III (normative sample)	10.9
WISC-IV (matched samples)	10.0
WISC-V (statistical controls normative sample)	8.7
RIAS-2 (normative sample)	8.0
Second Generation Intelligence Tests	
K-ABC (normative sample)	7.0
K-ABC (matched samples)	6.1
KABC-2 (matched samples)	5.0
CAS-2 (normative sample)	6.3
CAS (statistical controls normative sample)	4.8
CAS-2 (statistical controls normative sample)	4.3

Note: The data for these results are reported for the Stanford-Binet IV from Wasserman (2000); Woodcock-Johnson III from Edwards & Oakland (2006); Kaufman Assessment Battery for Children from Naglieri (1986); Kaufman Assessment Battery for Children-II from (Lichenberger, Sotelo-Dynega & Kaufman, 2009); CAS from Naglieri, Rojahn, Matto & Aquilino (2005); CAS-2 from Naglieri, Das & Goldstein, 2014; Wechsler Intelligence Scale for Children – IV (WISC-IV) from O'Donnell (2009), WISC-V from Kaufman, Raiford & Coalson (2016), Reynolds Intellectual Assessment Scale -2 Reynolds, C. R., & Kamphaus, R. W. (2015)

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Naglieri & Rojahn (2001)

- **White** children earned the same mean scores on WISC-III and CAS
- **Black** children earned lower VIQ than PIQ scores due to language / achievement tasks → low Full Scale
- **Black** children earned **higher** scores on CAS than whites
- **Fewer** Black children would be identified as having intellectual disability based on Full Scale scores using CAS than WISC-III
- **THIS IS A SOCIAL JUSTICE ISSUE.**

American Journal on Mental Retardation, 2001, Vol. 106, No. 4, 359-367

Intellectual Classification of Black and White Children in Special Education Programs Using the WISC-III and the Cognitive Assessment System

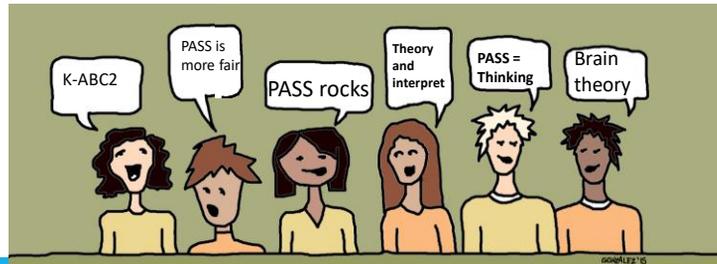
Jack A. Naglieri
George Mason University

Johannes Rojahn
The Ohio State University

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Core Group Activity

- **Organizer** – Have the group discuss this question: “What thoughts are there about these research studies on Race, IQ and PASS?”
- **Coach** – guide the discussion
- **Reporter** – will record and report to the group
- **Energizer** – keep the discussion going !



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Topical Outline

IQ tests and social justice are related

- Content of traditional IQ
- test items that require thinking versus knowing
- Are verbal tests needed for validity?
 - Evidence from KABC, CAS, NNAT, WISC5

Making Intelligence tests socially just

- Measure Neurocognitive ability (PASS)
 - A look at PASS and its measurement
 - research on race & ethnic differences on intelligence tests
- The impact this has on SLD and ID disability diagnosis



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Alex- Age 10- 4th grade

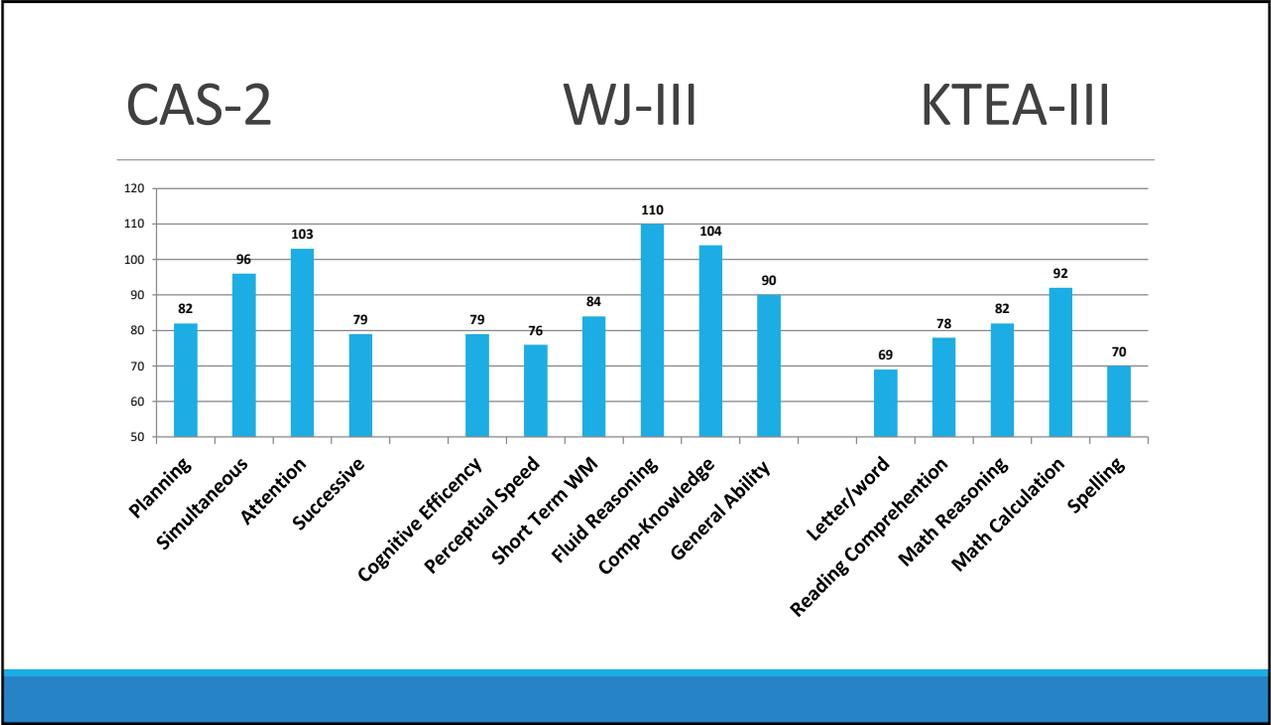
- Never referred but has had academic difficulties since 1 grade.
- Most current Spring MAP scores: Reading 8%ile, Math 16%ile
- Great difficulty with reading decoding and reading comprehension, getting work completed on time, difficulty understanding questions and providing elaborate responses.
- It was assumed that because he was a second language learner of limited language proficiency in L1 and L2, that was the cause of his difficulties.

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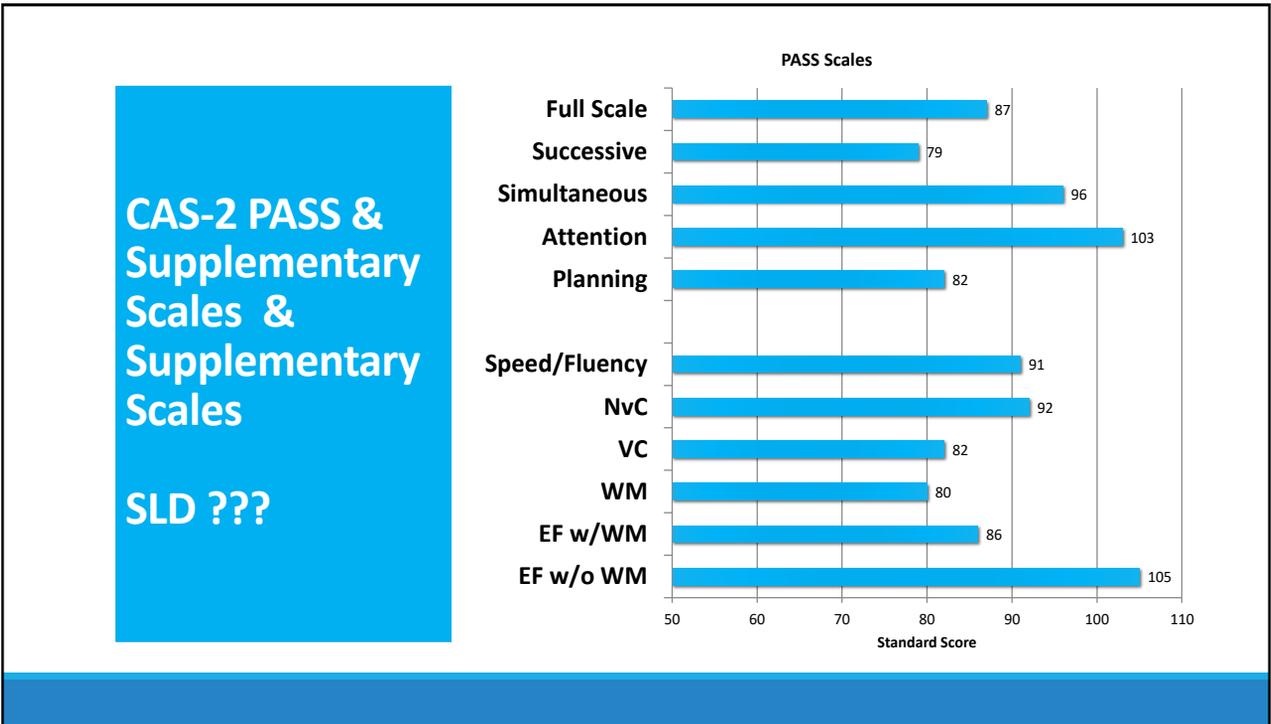
Observations

- Left handed
- Knew day, date and his complete birth date
- Indicated he does speak Spanish at home but prefers English with peers
- Use both English and Spanish with the examiner
- Took him 50 min to complete Math concepts and application subtest!
- Asked for repetition of items, difficulty deciding which math operation to use He did not understand the word " Altogether"
- Worked and reworked his calculations. Sometimes he noted they were not correct but was unsure why. On other occasions he knew he had made an error and kept reworking the problem.
- When reading he read slowly, words were segmented, occasional sound deletions noted and had difficulty bring the sounds together as one word.

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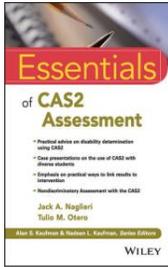
CAS-2 PASS & Supplementary Scales & Supplementary Scales

SLD ???

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Discrepancy Consistency Method (DCM)

- The Discrepancy Consistency Method (DCM) was first introduced in 1999 (most recently in 2017) as a way to operationalize the definition of a Specific Learning Disability (SLD) following from IDEA



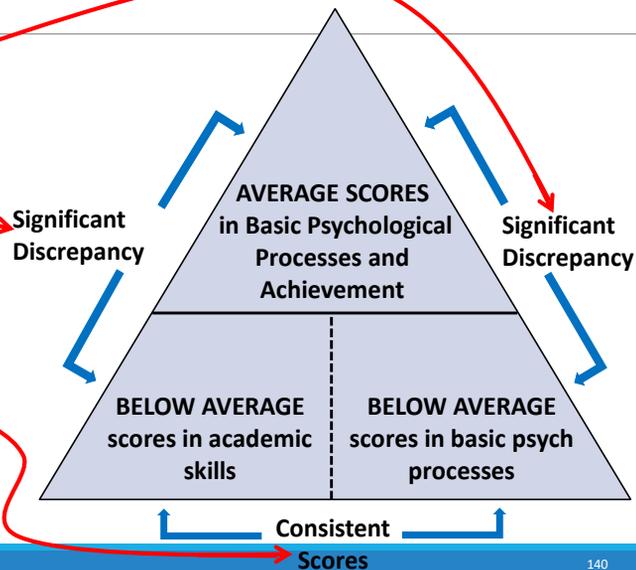
- SLD is “a disorder in 1 or more of the basic psychological processes ... which manifests itself in the imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations.”
- The disorder in 1 or more basic psychological processes is found when a student shows a pattern of strengths and weaknesses in basic psychological processes, **and...**
- There is an imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations. The result is two discrepancies and a consistency

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Discrepancy Consistency Method for SLD

- Discrepancy #1** between high and low processing scores
- Discrepancy #2** between high processing and low achievement
- Consistency** between low processing and low achievement

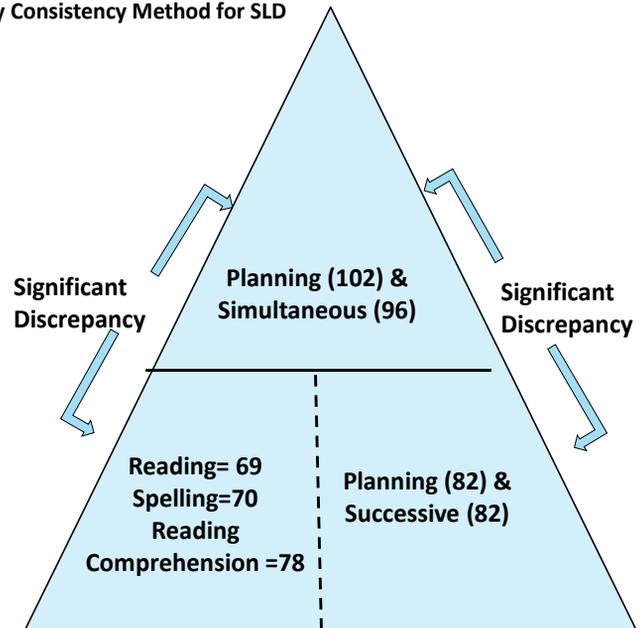


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IS ALEX SLD?

Discrepancy Consistency Method for SLD



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CASE STUDY: ALEJANDRO (C.A. 7-0
GRADE 1)

REASON FOR REFERRAL

- Academic:
 - Could not identify letters/sounds
 - October. Could only count to 39
 - All ACCESS scores of 1
- Behavior:
 - Difficulty following directions
 - Attention concerns
 - Refusal/defiance

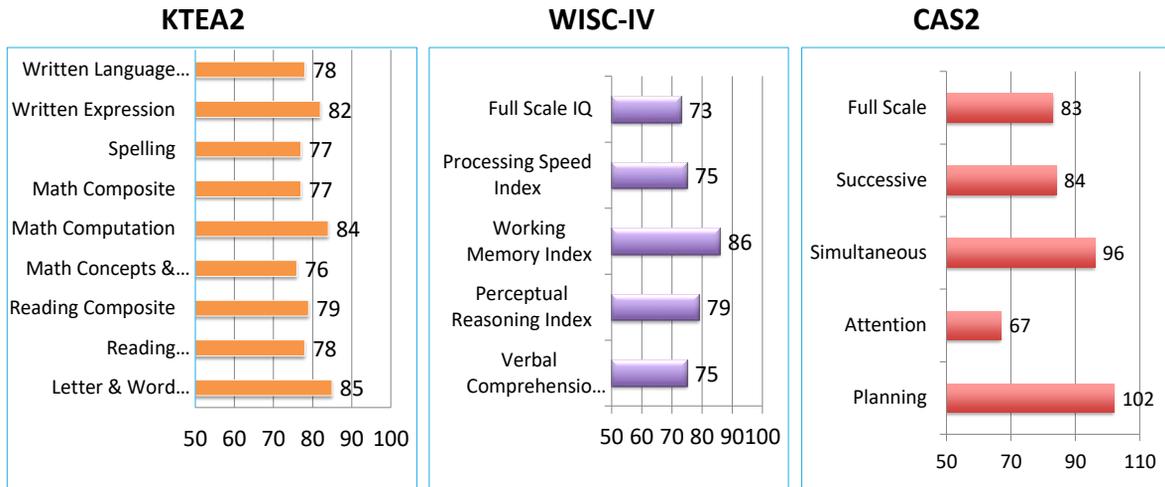


Note: this is not a picture of Alejandro

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WISC-IV ASSESSMENT



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Alejandro and PASS (by Dr. Otero)

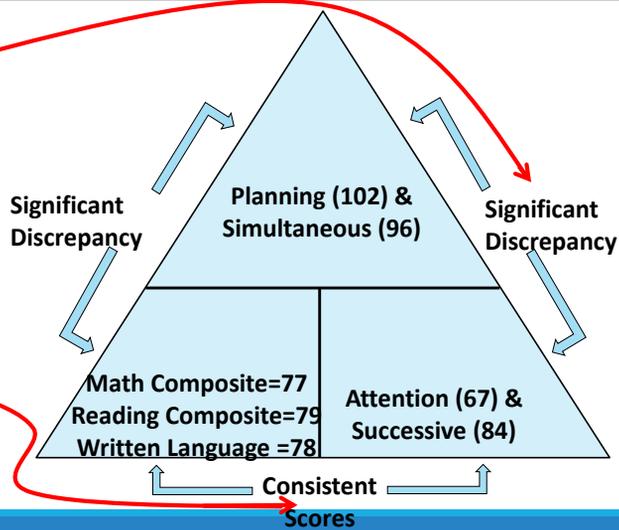
- ▶ Alejandro is not a slow learner.
- ▶ He has good scores in basic psychological processes:
 - ▶ **Simultaneous = 96 and Planning = 102**
- ▶ He has a “disorder in one or more of the basic psychological processes”
 - **Attention = 67 and Successive = 84**
- ▶ And he has academic failure which equals an SLD determination.

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Discrepancy Consistency Method for SLD

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

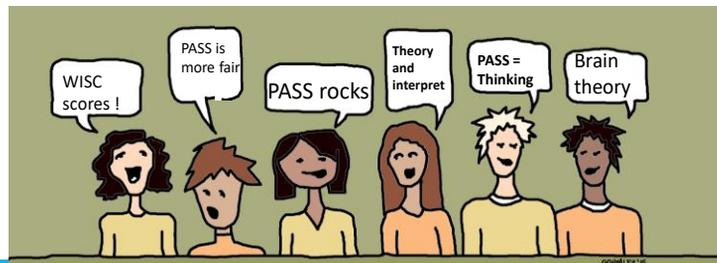


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Core Group Activity

- **O**rganizer – Have the group discuss this question: “Your reaction to the different views of Alejandro the different tests yield?”
- **C**oach – guide the discussion
- **R**eporter – will record and report to the group
- **E**nergizer – keep the discussion going !



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Hispanic Population is growing

In 2011, Hispanics accounted for 24% of the enrollment of public schools in the United States, and they are expected to represent 30% by 2023 (USDOE, 2010).

The growth rates for Hispanic children exceeds that of other minority groups.

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- Based on data collected on December 2017-February 2018, 11,554 students from Puerto Rico enrolled in public schools across School Districts.

State	School Enrollment as of 12/5/2018	School Enrollment as of 2/6/2018	% increase over 2015 total enrollment
Florida	10,324	11,554	6%
Massachusetts	2,298	2,556	3%
Pennsylvania	2,407	2,874	3%
New York	2,052	2,218	1%
Connecticut	1,188	1,827	3%
New Jersey	No Data	886	1%

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Social justice for Hispanic students

- In order to achieve social justice and equity for this population we need to select evaluation methods that allow us to measure thinking with minimal influence of knowing.
- Neurocognitive processing tests are much preferred to traditional IQ

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Case of María by Dr. Mary A. Moreno

Hispanic children are more prone to be misclassified using traditional abilities tests, not qualifying for special education services, and as underrepresented in gifted programs.

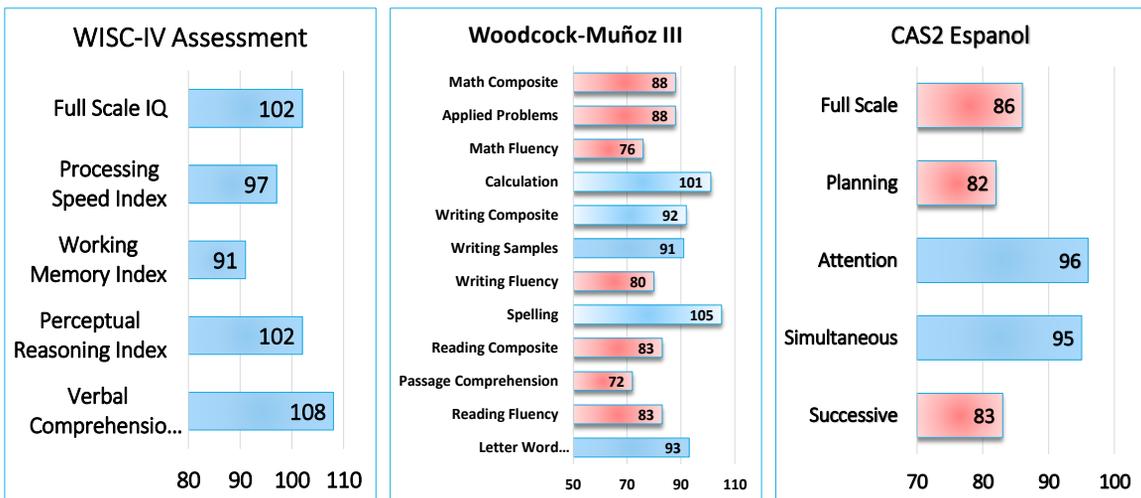
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Reason for Referral: Maria (C.A. 13-8 GRADE 8)

- **Delays in mathematical skills**
 - Mainly use of fractions
 - Difficulties with multiplication
 - **Reading and writing**
 - Poor reading fluency (slow labored reading)
 - Mistakes when reading aloud, repeats, stops often or “losses place” when reading
 - Reads without expression and ignores punctuation marks
 - Organizational problems in reading and writing
 - Writes very slowly
 - **Learn Aid Test:** scores low average in reading and math (scores = 1)
- Previous evaluation using different Wechsler versions (WPPSI, WISC-R PR) her general IQ scores were high average.
 - Achievement test scores were below average in math
 - Interventions:
 - **School special program**
 - Small groups
 - Supervised studies
 - **Private tutoring at home**

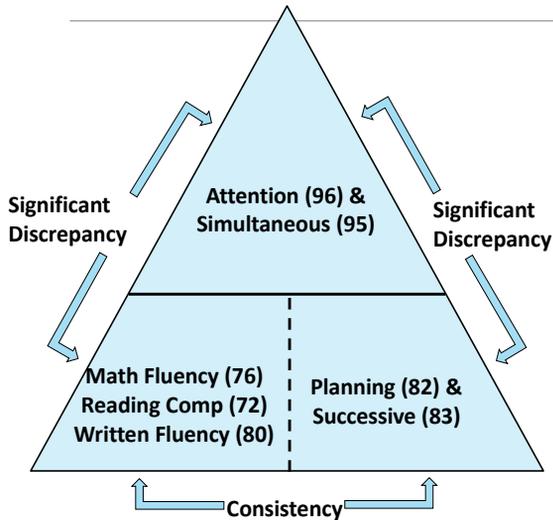
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Equitable Testing Requires More than Avoiding Knowledge



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Discrepancy Consistency Method for SLD



- ▶ María has a “disorder in one or more of the basic psychological processes”
 - Planning = 82 and Successive = 83
- ▶ Good scores in basic psychological processes:
 - Simultaneous = 95 & Attention = 96
- ▶ She has documented:
 - Academic difficulties – Fluency, math and reading skills
 - Behavioral difficulties – Anxiety
 - Executive functioning difficulties in Organization & self-monitoring

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Intervention Plan

- ▶ Explain PASS scores to engage the student in the solutions and build confidence
- ▶ Build on Strengths
 - In this case good ability to attend, resist distractions, and see how things and ideas are inter-related.
- ▶ Encourage the use of metacognitive strategies (Planning) that can improve tasks that demand Successive processing
 - See Naglieri and Pickering’s book for Successive processing strategies such as chunking, segmenting, and related methods.

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Interventions related to PASS

- *Helping Children Learn Intervention Handouts for Use in School and at Home, Second Edition* (Naglieri, & Pickering 2011)
- Graphic Organizer or Word Families use strength in Simultaneous
- Segmenting to make Successive tasks more manageable

Graphic Organizers for Connecting and Remembering Information

Remembering and making information is a common part of learning and daily life. Students are often expected to learn large amounts of new and unrelated information. Learning tools designed to help students connect and remember information are called graphic organizers. They are designed to help students and teachers present and organize information so it is easier to understand and remember.

Graphic Organizers

Have information to better understand it if it connected to information the students already know. Graphic organizers are visual representations of information that shows the links of new information to other new and existing information. They connect the new information to a student's existing knowledge. Furthermore, the visual nature of graphic organizers and the fact they make help students understand the connections between information parts. For example, a graphic organizer might be used to teach young children about different animals. A child learning about different kinds of animals might already know about a dog. This knowledge can be used to generalize to other animals, such as, cats, and dolphins. They also know, but often have left and are not. Children can learn to connect and remember as they learn from Figure 1. Represents one way to help find graphic organizers.

How to Teach Graphic Organizers

Graphic organizers are very simple to create. They need not be complex or technical. They can be used for many tasks such as writing, reading, and organizing writing and developing language skills. The following list shows one way to create a graphic organizer:

1. Select information that you need to present to the class which may be from a story, a chapter, or any concept.
2. Determine the key components that are necessary for the class to learn.

Segmenting Words for Reading/Decoding and Spelling

Choosing a written word makes the person to make sense out of printed letters and words and to transfer their experience into sound. This demands understanding the context that letters represent and how letters work together to make words. Sometimes words can be segmented into parts for easier and faster reading. The word *cat* is a good example because it contains two words that are already known or are to. Segmenting words can be a helpful strategy for reading as well as spelling.

How to Teach Segmenting Words

Segmenting words is an effective strategy to help students read and spell. By dividing the words into graphic organizers also means about how words are constructed and how the parts are related to one another. Students should be taught that words can be broken down into syllables or chunks. The teacher should present the following methods in a direct and explicit manner:

- Take the word apart. Break down the word into its component parts or syllables. For example, take the word *cat* and divide it into the *c*, *a*, and *t* and label each letter.
- Identify prefixes. A prefix is a letter or group of letters at the beginning of a word. When a word has a prefix, imagine that there is a space between the prefix and the rest of the word, and you can usually use the main word. For example, *prefix* means the prefix *pre-* and the word *fix*. You can use the prefix *pre-* and the word *fix* to make the word *prefix*.

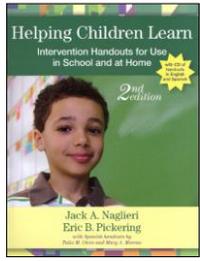
Who Should Learn This Technique?

This instruction is likely to benefit students who are poor in reading and spelling. Because the main reason for poor reading and spelling is a lack of knowledge about the sound of letters and how they work together to make words. This strategy should also be used with students who are poor in reading and spelling because it will help them understand reading in a more strategic way that does not rely on their problem areas.

Resources

An excellent resource can be found at <http://www.ck12.org>

Figure 1. A. (2008). Examples of graphic organizers. New York, John Wiley & Sons.



A Cognitive Strategy Instruction to Improve Math Calculation for Children With ADHD and LD: A Randomized Controlled Study

Jackie S. Iseman¹ and Jack A. Naglieri¹

Abstract

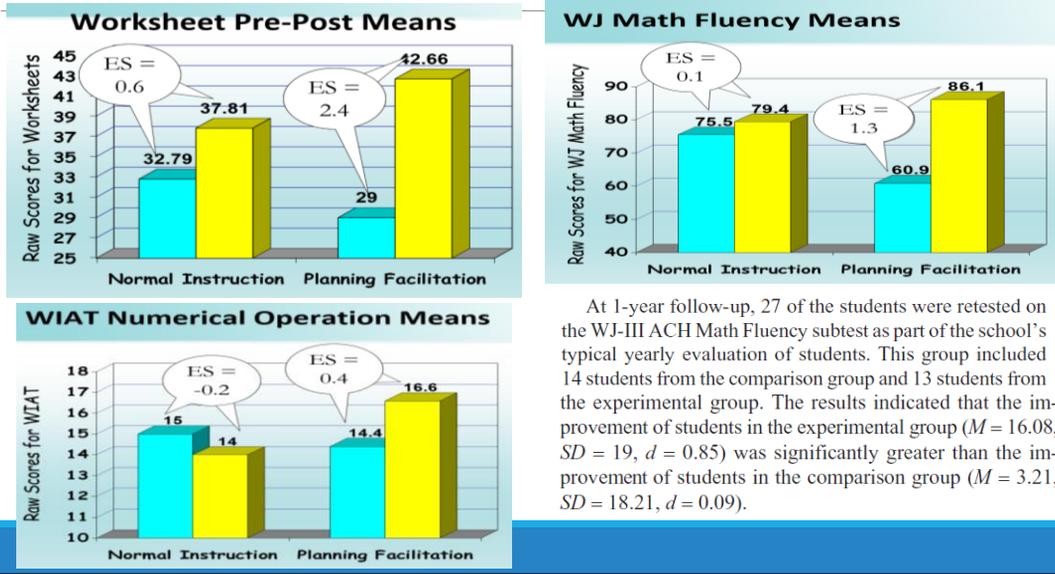
The authors examined the effectiveness of cognitive strategy instruction based on PASS (Planning, Attention, Simultaneous, Successive) given by special education teachers to students with ADHD randomly assigned by classroom. Students in the experimental group were exposed to a brief cognitive strategy instruction for 10 days, which was designed to encourage development and application of effective planning for mathematical computation, whereas the comparison group received standard math instruction. Standardized tests of cognitive processes and math achievement were given at pretest. All students completed math worksheets throughout the experimental phase. Standardized achievement tests (*Woodcock-Johnson Tests of Achievement, Third Edition*, Math Fluency and *Wechsler Individualized Achievement Test, Second Edition*, Numerical Operations) were administered pre- and postintervention, and Math Fluency was also administered at 1 year follow-up. Large pre-post effect sizes were found for students in the experimental group but not the comparison group on math worksheets (0.85 and 0.26), Math Fluency (1.17 and 0.09), and Numerical Operations (0.40 and -0.14, respectively). At 1 year follow-up, the experimental group continued to outperform the comparison group. These findings suggest that students with ADHD evidenced greater improvement in math worksheets, far transfer to standardized tests of math (which measured the skill of generalizing learned strategies to other similar tasks), and continued advantage 1 year later when provided the PASS-based cognitive strategy instruction.

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SAGE



Pre-Post Means and Effect Sizes for the Students with LD and ADHD



At 1-year follow-up, 27 of the students were retested on the WJ-III ACH Math Fluency subtest as part of the school's typical yearly evaluation of students. This group included 14 students from the comparison group and 13 students from the experimental group. The results indicated that the improvement of students in the experimental group ($M = 16.08$, $SD = 19$, $d = 0.85$) was significantly greater than the improvement of students in the comparison group ($M = 3.21$, $SD = 18.21$, $d = 0.09$).

Summary of PASS Intervention Research in Essentials of CAS2

Effectiveness of a Cognitive Strategy Intervention in Improving Arithmetic Computation Based on the PASS Theory

Jack A. Naglieri and Deanne Johnson

Abstract
The purpose of this study was to determine if an instruction designed to facilitate planning, given by teachers to their class as a group, would have differential effects depending on the specific Planning, Attention, Simultaneous, Successive (PASS) cognitive characteristics of each child. A cognitive strategy instruction that encouraged planning was provided to a group of 12 students with learning disabilities. All students completed math worksheets that involved planning, attention, simultaneous, and successive processes. The results showed that children with a cognitive weakness in Planning benefited from the instruction designed to facilitate planning, whereas children with a cognitive weakness in Attention (small effect size of 0.3), Successive (medium effect size of 0.4), and no cognitive weakness in Successive (no effect size) did not benefit from the instruction designed to facilitate planning.

A Cognitive Strategy Instruction to Improve Math Calculation for Children With ADHD and LD: A Randomized Controlled Study

Jackie S. Isemann and Jack A. Naglieri

Abstract
The authors examined the effectiveness of cognitive strategy instruction based on PASS (Planning, Attention, Simultaneous, Successive) given by special education teachers to students with ADHD randomly assigned by classroom. Students in the experimental group were exposed to a brief cognitive strategy instruction for 10 days, which was designed to encourage development and application of effective planning for mathematical computation, whereas the comparison group received standard math instruction. Standardized tests of cognitive processes and math achievement were given at pretest. All students completed math worksheets throughout the experimental phase. Standardized achievement tests (Woodcock-Johnson Tests of Achievement, Third Edition, Math Fluency and Wechsler Individualized Achievement Test, Second Edition, Numerical Operations) were administered pre- and postintervention, and Math Fluency was also administered at 1 year follow-up. Large pre-post effect sizes were found for students in the experimental group but not the comparison group on math worksheets (0.83 and 0.26), Math Fluency (1.17 and 0.09), and Numerical Operations (0.40 and -0.14, respectively). At 1 year follow-up, the experimental group continued to outperform the comparison group. These findings suggest that students with ADHD evidenced greater improvement in math worksheets, for transfer to standardized tests of math (which measured the skill of generating learned strategies to other similar tasks), and continued advantage 1 year later.

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REMEDIATING READING COMPREHENSION DIFFICULTIES: A COGNITIVE PROCESS APPROACH

SHAMITA MAHAPATRA
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A cognitive-based remediation program was investigated with 14 low-achieving (ESL) poor readers in Grade 4 who had significant comprehension and 14 normal ESL readers in Grade 4 who were high-achievers. Both groups were selected from 2 English-medium schools. Significant pre-test to post-test changes in word reading, comprehension, attention-simultaneous-successive cognitive processes, and reading comprehension were observed for the low-achieving group.

Mathematics Instruction and PASS Cognitive Processes: An Intervention Study

Jack A. Naglieri and Suzanne H. Gotting

Abstract
The purpose of this study was to determine if an instruction designed to facilitate planning, given by teachers to their class as a group, would have differential effects depending on the specific cognitive characteristics of the individual students. A cognitive instruction that facilitated planning was provided to a group of 12 students with learning disabilities. All students completed math worksheets during 7 sessions of baseline and 21 sessions of intervention (when the instruction designed to facilitate planning was provided). During the intervention phase, students engaged in self-reflection and verbalization about how mathematics problems were completed. The class was sorted according to planning, attention, simultaneous, and successive processes, which is based on Planning, Attention, Simultaneous, Successive (PASS) theory. The results, consistent with previous research, showed beneficial effects for all students but was especially helpful for the implications of these findings are provided.

J. F. Day, Danyoung V. Hayward, George K. Georgioulas
University of Alberta

Troy Janzen
Taylor University College
Neelam Bora
NishiChokmah Middle School

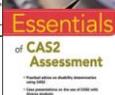
Comparing the Effectiveness of Two Reading Intervention Programs for Children With Reading Disabilities

Abstract
The effectiveness of two reading intervention programs (phonics-based and intensive learning) was investigated with 63 First Nations children identified as poor readers in Grades 1 and 4 in Study 1, whereas in Study 2, the efficacy of booster sessions for intensive learning or PRSP (PASS Reading Enhancement Program) was examined. The more dependent variables in Study 1 were pretest to posttest changes following intervention on reading rates for word reading and word decoding. Other dependent variables tested were of phonological awareness, rapid naming speed, and cognitive tests of Planning, Attention, Successive, and Simultaneous processing (PASS). Results of Study 1 showed a significant improvement on both reading tasks following intensive learning.

PLANNING FACILITATION AND READING COMPREHENSION: INSTRUCTIONAL RELEVANCE OF THE PASS THEORY

Frederick A. Haddad
Kyrene School District, Tempe, Arizona
Y. Evie Garcia
Northern Arizona University
Jack A. Naglieri
George Mason University
Michelle Grinditch, Ashley McAndrews, Jane Eubanks
Kyrene School District, Tempe, Arizona

This study was to evaluate whether the instruction designed to facilitate planning would benefit on reading comprehension on the specific Planning, Attention, and Successive (PASS) processes. The results showed that children with a Planning weakness ($n = 10$) benefited substantially (effect size of 1.32) from the instruction designed to facilitate planning. Children with no weakness ($n = 21$; effect size = .32) or a Successive weakness ($n = 11$; effect size of .80) did not benefit as much. These results support previous research suggesting that PASS profiles are relevant to instruction.



The case of María (by Dr. Moreno-Torres)

▶ Conclusions:

- ▶ She has intra-individual differences in basic psychological processes that underlie her academic problems.
- ▶ She earned CAS-2 Successive processing and Planning scores below the average range.
- ▶ She has considerable problems working with academic tasks that demand:
 - ▶ Sequencing of information
 - ▶ Use of different strategies and cognitive flexibility
- ▶ María has low scores in basic reading, math and writing organization
- ▶ Taken together, the results provide evidence of a disorder in basic psychological processing with academic failure = SLD

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Final Thoughts About Maria

- Maria's case is similar to that of thousands of Hispanic children currently attending schools in the United States.
- Some of them may present academic difficulties that may be confused with difficulties in language proficiency.
- When evaluating them, it is important to use instruments that allow the identification of cognitive strengths and weaknesses that underlie their academic difficulties, without penalizing them for their difficulties in defining or explaining concepts.

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Core Group Discussion

- Organizer – Have your group discuss: **FINAL THOUGHTS FOR THE DAY**
 - What ‘take away’ thoughts do you have?
 - What implications does this have for your practice?
- Coach – Help the group organize their thoughts
- Reporter – Keep notes and report on the conversation
- Energizer – Focus !



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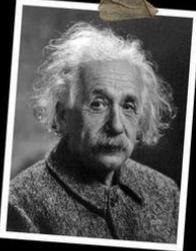
Conclusions: Testing and Social Justice

- We have shown you why the historical foundations of traditional intelligence tests pose an obstacle for social justice – too much knowledge for diverse populations, and that IQ tests are too limited in scope.
- We have also shown research on race and ethnic differences which show how a neurocognitive approach such as the CAS can help ensure a more socially just approach to assessment.
- We hope we have given you enough information so that you can identify measures of intelligence that are most appropriate from a social justice perspective for the diverse populations you work with.

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REFLECT ON THESE

<p>"Education is not the learning of facts, but the training of the mind to think." -Albert Einstein</p> 		<p>Make a career of humanity. Commit yourself to the noble struggle for equal rights. You will make a greater person of yourself, a greater nation of your country, and a finer world to live in.</p> <p>— <i>Martin Luther King</i> —</p> <p>AZ QUOTES</p>
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