Intelligence redefined as PASS Neurocognitive Abilities using the CAS2

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Presentation Outline

- Introduction
  - Using groups to stimulate thinking
  - How traditional IQ has influenced us
- A new way of thinking about intelligence
  - What is PASS theory of learning
  - How to measure PASS neurocognitive processes
- Case studies
- Final thoughts

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Core Groups

- Groups of 3-5
- Introduce yourself to the group
- Establish roles:
  - **C**oach
  - **O**rganizer (keeps time)
  - **R**ecorder
  - **E**nergizer
- Why is it important to think and learn in groups?

5

"Just Think!"

- What do we mean – Just think?
- Thinking has many names
  - Metacognition, executive function, mindfulness, cognitive processing, IQ, intelligence, attention, reasoning, problem solving, memory etc.
- Psychologists have used these terms when defining thinking -- especially intelligence
- We need to reflect on the concept of IQ and intelligence to define how to THINK SMART

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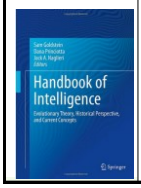
Evolution of IQ

http://www.jacknaglieri.com/cas2.html



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

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Jack A. Naglieri

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

Context

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

Origins of Traditional IQ

- On July 20, 1917 the authors 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 are more than 100 years OLD!**

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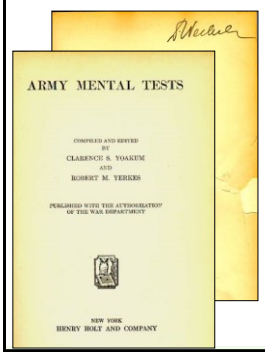
IQ's Origins



- Yoakum & Yerkes (1920) created IQ tests used today

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1920 Army Testing

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

Verbal & Quantitative

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

Nonverbal

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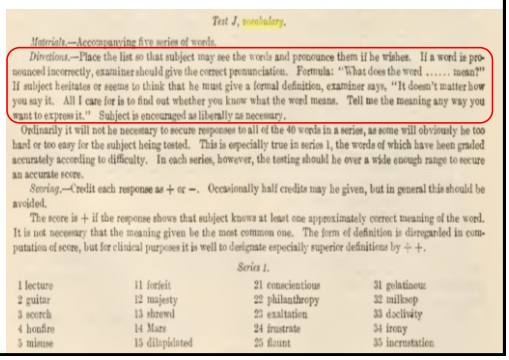
Army Mental Tests - Vocabulary (WISC-V)



Test 1, 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.

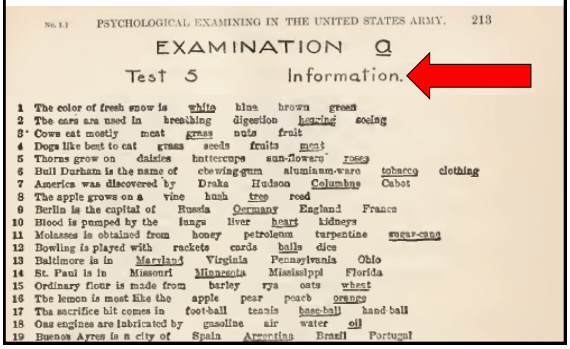
Scoring.—Credit each response as + or −. Occasionally half credits may be given, but in general this should be avoided.

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 docilityy
4 bonfire	14 Mars	24 frustrate	34 irony
5 misuse	15 dilapidated	25 flaunt	35 incrustation

Army Mental Tests - Information (WISC-V)



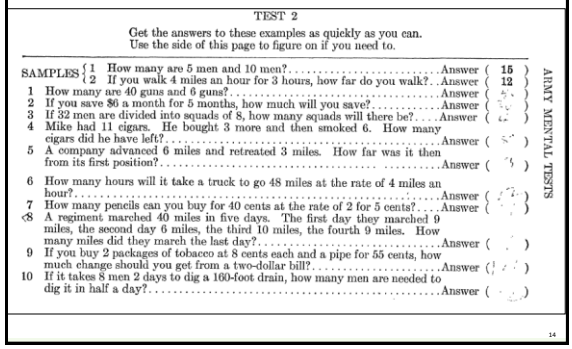
No. 1.1 PSYCHOLOGICAL EXAMINING IN THE UNITED STATES ARMY. 213

EXAMINATION Q

Test 5 Information.

1 The color of fresh snow is white blue brown green
2 The ears are used in breathing digestion hearing seeing
3 Cows eat mostly meat grass nuts fruit
4 Dogs like best to eat grass seeds fruits meat
5 Thorns grow on daisies buttercups sun-flowers roses
6 Bull Durham is the name of chewing-gum aluminum-ware tobacco clothing
7 America was discovered by Drake Hudson Columbus Cabot
8 The apple grows on a vine bush tree reed
9 Berlin is the capital of Russia Germany England France
10 Blood is pumped by the lungs liver heart kidneys
11 Molasses is obtained from honey petroleum turpentine sugar-cane
12 Bowling is played with rackets cards balls dice
13 Baltimore is in Maryland Virginia Pennsylvania Ohio
14 St. Paul is in Missouri Minnesota Mississippi Florida
15 Ordinary flour is made from barley rye oats wheat
16 The lemon is most like the apple pear peach orange
17 The sacrifice hit comes in foot-ball tennis base-ball hand-ball
18 Gas engines are lubricated by gasoline air water oil
19 Buenos Ayres is a city of Spain Argentina Brazil Portugal

Army Mental Tests - Arithmetic (WISC-V)



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)

1 How many are 40 guns and 6 guns? ... Answer ( )
2 If you save $6 a month for 5 months, how much will you save? ... Answer ( )
3 If 32 men are divided into squads of 8, how many squads will there be? ... Answer ( )
4 Mike had 11 cigars. He bought 3 more and then smoked 6. How many cigars did he have left? ... Answer ( )
5 A company advanced 6 miles and retreated 3 miles. How far was it then from its first position? ... Answer ( )
6 How many hours will it take a truck to go 48 miles at the rate of 4 miles an hour? ... Answer ( )
7 How many pencils can you buy for 40 cents at the rate of 2 for 5 cents? ... Answer ( )
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 ( )
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 ( )
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 ( )

ARMY MENTAL TESTS

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NONVERBAL TESTS

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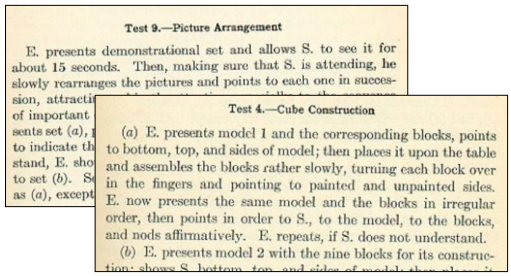
Army Mental Tests → Picture Arrangement & Block Design (WISC-V)



Test 9.—Picture Arrangement

E. presents demonstrational set and allows S. to see it for about 15 seconds. Then, making sure that S. is attending, he slowly rearranges the pictures and points to each one in succession, attracti... of important ... sents set (a), ... to indicate th... stand, E. sho... to set (b). S... as (a), except...

Test 4.—Cube Construction

(a) E. presents model 1 and the corresponding blocks, points to bottom, top, and sides of model; then places it upon the table and assembles the blocks rather slowly, turning each block over in the fingers and pointing to painted and unpainted sides. E. now presents the same model and the blocks in irregular order, then points in order to S., to the model, to the blocks, and nods affirmatively. E. repeats, if S. does not understand.

(b) E. presents model 2 with the nine blocks for its construc... shows S. bottom, top, and sides of model; then places it...

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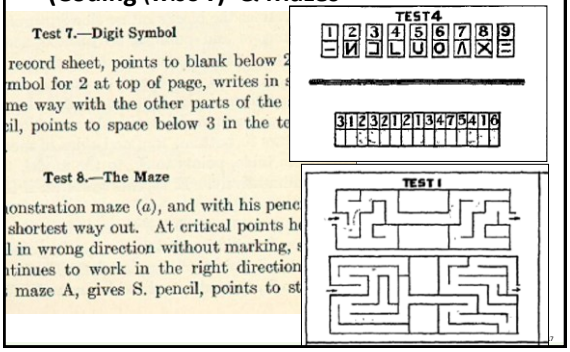
Army Mental Tests - WISC Digit Symbol (Coding (WISC-V) & Mazes



Test 7.—Digit Symbol

record sheet, points to blank below 2
mbol for 2 at top of page, writes in s
me way with the other parts of the
il, points to space below 3 in the to

TEST 4

1	2	3	4	5	6	7	8	9
–	И	⌐	L	U	O	Λ	X	=

3	1	2	3	2	1	2	1	3	4	7	5	4	1	6

Test 8.—The Maze

onstration maze (a), and with his penc
shortest way out. At critical points h
l in wrong direction without marking,
tinues to work in the right direction
maze A, gives S. pencil, points to st

TEST 1

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How did the US Army tests become IQ Tests?

Because of David Wechsler

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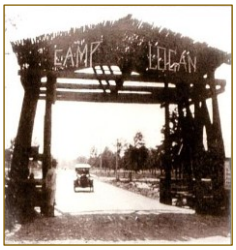
Origins of Traditional IQ

- In May of 1918 a 22 year-old David Wechsler administered the Alpha and Beta (Yerkes, 1921, p. 40) at Camp Logan in Texas
- He made a version of the Army tests for use by clinical psychologists
  - He contacted the Psychological Corporation, and spoke to ….



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Army Alpha and Beta

- The Army Alpha (Verbal & Quantitative) tests became Wechsler's **Verbal IQ scale**
- The Army Beta (visual-spatial) tests became Wechsler's **Performance IQ**, which is now referred to as Nonverbal
- **Did this mean Wechsler believed in Verbal and Nonverbal intelligences?**

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What a Nonverbal Test Measures

(Naglieri, Brulles, & Lansdown, 2008)

Helping All Gifted Children Learn: A Teacher's Guide to Using the NNAT2

It is important to understand that even though Wechsler's intelligence (IQ) tests were organized into verbal and nonverbal sections, he did not mean that verbal and nonverbal are different types of ability. Wechsler (1958) explicitly stated that the organization of subtests into verbal and performance scales did *not* indicate that two distinctive types of intelligence were being measured. In fact, he

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What a Nonverbal Test Measures

(Naglieri, Brulles, & Lansdown, 2008)

wrote: "the subtests are *different measures of intelligence*, not *measures of different kinds of intelligence"* (p. 64). Similarly, Naglieri (2003) further clarified that "the term nonverbal refers to the content of the test, not a type of ability" (p. 2). Thus, tests may differ in their content or specific demands, but still measure the concept of general intelligence.

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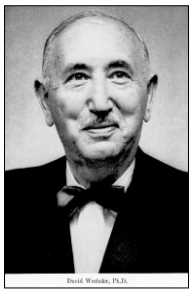
Wechsler's Definition

- Definition of intelligence does not mention verbal or nonverbal *abilities*:

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



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Verbal Nonverbal Intelligence?

- Verbal / Nonverbal is a practical division
- Advantages of Verbal tests
  - they correlate with achievement because they have achievement in them
    - Information, Vocabulary, Arithmetic
- Advantages of Nonverbal Tests
  - they correlate with achievement without having achievement in them
- **Why NONVERBAL** ?

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1927 Army Testing

Why Beta?

METHODS AND RESULTS 19

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

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

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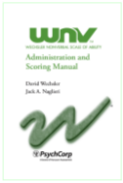
Spearman's *g*



Foreword

of nonverbal assessment many paces forward. In addition, the emphasis in the *WNV Manual* that the Full Scale measures *general ability nonverbally*—and *not* nonverbal ability—is an important distinction that further ties the WNV to Dr. Wechsler. Although his intelligence tests in the 1930s and 1940s departed from the one-score *Stanford-Binet* by offering separate Verbal and Performance IQs as well as a profile of scaled scores, Dr. Wechsler remained a firm believer in Spearman's *g* theory throughout his lifetime. He believed that his Verbal and Performance Scales represented different ways to access *g*, but he never believed in nonverbal intelligence as being separate from *g*. Rather, he saw the Performance Scale as the most sensible way to measure the general intelligence of people with hearing impairments, language disorders, or limited proficiency in English. And that is precisely what the WNV is intended to do.

Alan S. Kaufman, PhD
Clinical Professor of Psychology
Yale Child Study Center
Yale University School of Medicine

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Are Verbal IQ test items different from achievement test items?

The answer may surprise you…

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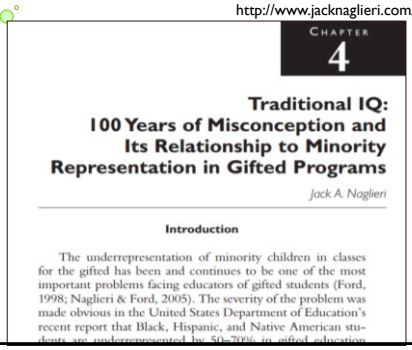
Verbal intelligence or achievement?

http://www.jacknaglieri.com/nnat.html



CHAPTER 4

Traditional IQ: 100 Years of Misconception and Its Relationship to Minority Representation in Gifted Programs

Jack A. Naglieri

Introduction

The underrepresentation of minority children in classes for the gifted has been and continues to be one of the most important problems facing educators of gifted students (Ford, 1998; Naglieri & Ford, 2005). The severity of the problem was made obvious in the United States Department of Education's recent report that Black, Hispanic, and Native American students are underrepresented by 50–70% in gifted education

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VIQ is Achievement - Vocabulary

What does *scared* mean?
(The child answers orally)

Someone who is *glad* is
(a) tall
(b) proud
(c) happy
(d) alone

Wechsler or Binet Vocabulary item presented orally by the examiner:

Stanford Achievement Test Reading Vocabulary

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VIQ is Achievement - Arithmetic

"A boy had twelve books and sold five. How many books did he have left?"

Stanford-Binet 5th Ed. Quantitative items

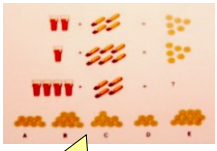
Peter counted seventeen lily pads at the pond. There were frogs sitting on five of the lily pads, and the rest were empty. How many lily pads were empty?
(a) 22 (b) 13 (c) 12

Stanford Achievement Test Math item

30

Quantitative Ability or Achievement?

- "Drinks and snacks cost money. Show me how much money these drinks and snacks would cost."



SB5 Quantitative Reasoning

- "If you bought both balls and you had this much money, how much money would you have left?"

WJ-III ACH Applied Problems

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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 will be at disadvantage when assessed with so-called Verbal and Quantitative reasoning "ability" tests

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Poverty and Test Scores

- Children from homes with limited enrichment receive low test scores because of unequal opportunity to learn
- Too many minority students are penalized on traditional tests of intelligence leading to under- and over-representation
- Many children with Specific Learning Disabilities do poorly on Verbal and Quantitative tests because of school failure and get LOW IQs

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Minority Representation

- The over-representation of minorities in special education is a significant problem (Naglieri & Rojahn, 2000).
- There is under-representation of minorities in gifted (Ford, 1998).
  - Black, Hispanic, and Native American students by 50% to 70% (U.S. Dept of Education, 1993)

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Case of Alejandro

Note: this is not a picture of Alejandro

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

REASON FOR REFERRAL

- Academic:
  - Could not identify letters/sounds
  - October 2013: Could only count to 39
  - All ACCESS scores of 1
- Behavior:
  - Difficulty following directions
  - Attention concerns
  - Refusal/defiance

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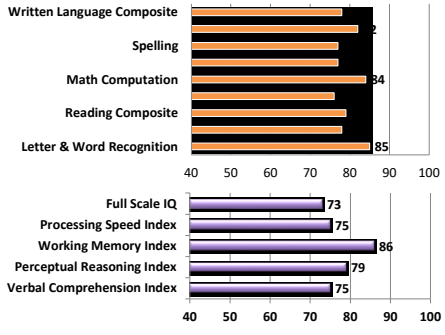
WISC-IV ASSESSMENT



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CORE Group Thinking

What would you say about Alejandro's abilities based on this assessment?

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BACK TO ALEJANDRO

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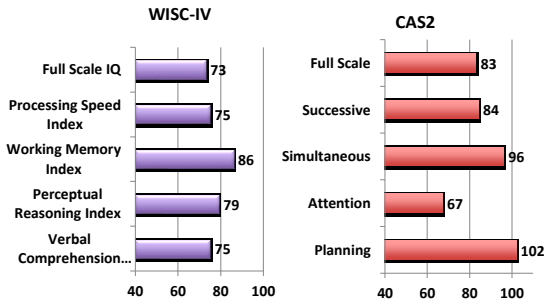
Assessing Brain Function is Different



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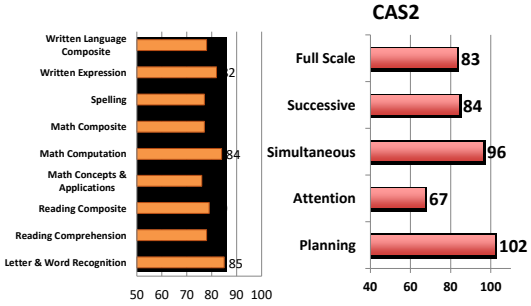
Alejandro's Results



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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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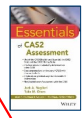
Discrepancy Consistency Method for SLD

- **Discrepancy #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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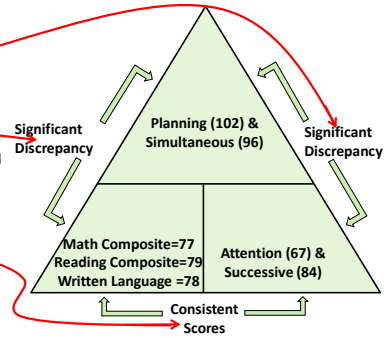
Discrepancy Consistency Model for SLD

- 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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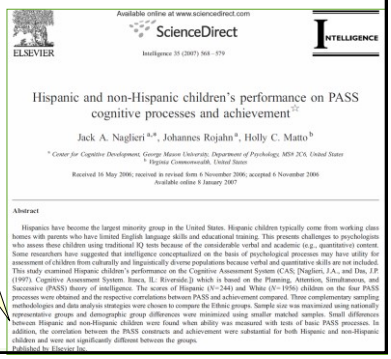
Naglieri, Rojahn, Matto (2007)

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



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

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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 between Hispanic and non-Hispanic children were found when ability was measured with tests of basic PASS processes. In addition, the correlation between the PASS constructs and achievement were substantial for both Hispanic and non-Hispanic children and were not significantly different between the groups.

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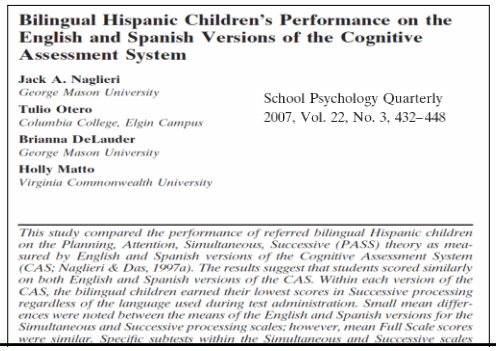
PASS scores – English and Spanish



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

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

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

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English & Spanish CAS

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

	CAS English		CAS Spanish		*d*-ratio	Correlations	
	Mean	*SD*	Mean	*SD*	*d*	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

A. Naglieri, Ph.D.

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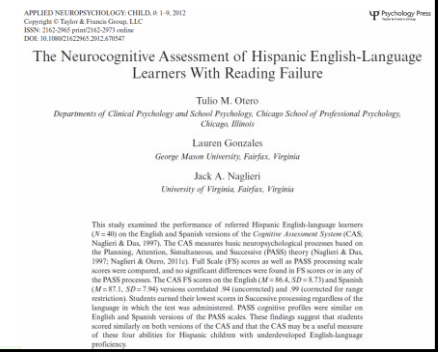
Otero, Gonzales, Naglieri (2012)

- SLD and PASS scores



APPLIED NEUROPSYCHOLOGY: CHILD, 0: 1–9, 2012
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Psychology Press

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

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Lauren Gonzales
George Mason University, Fairfax, Virginia
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.

CAS in Italy

Psychological Assessment

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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University of Virginia and Devereux Center for Resilient Children

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University of Florence

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Multi-Health Services, Toronto, Ontario, Canada

ned Italian and U.S. children's performance on the English and Italian versions, e Cognitive Assessment System (CAS; Naglieri & Conway, 2009; Naglieri & Das, d on a neurocognitive theory of intelligence entitled PASS (Planning, Attention, Successive; Naglieri & Das, 1997; Naglieri & Otero, 2011). CAS subtest, PASS ale scores for Italian (N = 809) and U.S. (N = 1,174) samples, matched by age and mined. Multigroup confirmatory factor analysis results supported the configural CAS factor structure between Italians and Americans for the 5- to 7-year-old error of approximation [RMSEA] = .038, 90% confidence interval [CI] = .033, .043; ex [CFI] = .96) and 8- to 18-year-old (RMSEA = .036, 90% CI = .028, .043; CFI = he Full Scale standard scores (using the U.S. norms) for the Italian (100.9) and U.S. re nearly identical. The scores between the samples for the PASS scales were very the Attention Scale (d = 0.26), where the Italian sample's mean score was slightly mean differences were found for 9 of the 13 subtest scores, 3 showed small d-ratios talian sample), and 1 was large (in favor of the U.S. sample), but some differences in were found. These findings suggest that the PASS theory, as measured by CAS, yields s and showed factorial invariance for these samples of Italian and American children, ral and linguistic characteristics.

US and Italian Samples– Mean Scores

Table 5
Means and SDs for Italian Children (N = 809) on the CAS Subtests and PASS and Full Scales Using U.S. Norms and Comparisons to U.S. Sample (N = 1,174), Matched by Age

Subtests and scales	Italian			U.S.					
	M	*SD*	*n*	*M*	*SD*	*n*	*F*	*p*	*d*-ratio
CAS composite scales									
Planning	97.7	13.4	809	100.5	15.4	1,174	18.1	<.01	−0.19
Simultaneous	103.0	13.9	809	101.1	14.1	1,174	9.3	<.01	0.14
Attention	104.2	13.7	809	100.6	14.4	1,174	32.2	<.01	0.26
Successive	99.0	12.5	809	100.5	14.5	1,174	5.1	.02	−0.11
Full Scale	100.9	12.9	809	100.5	14.8	1,174	2.3	.13	0.03

Note. CAS = Cognitive Assessment Sys… = Planning, Attention, Simultaneous, and Successive. U.S. sample *N*s vary due Designations for *d*-ratios are as follow… <.2), S = small (.2), M = medium (.5), and L = large (.8). For all *F* values the *df*s a for Speech Rate (1, 1219) and S… 762).

Italian mean = 100.9 &US mean = 100.5 using US NORMS

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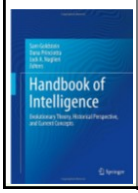
Non-Discriminatory Tests



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

Jack A. Naglieri

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

Context

April 6, 1917, is remembered as the day the United States entered World War I. On that same day a group of psychologists held a meeting in Harvard University's Emerson Hall to discuss the possible role they could play with the war effort (Yerkes 1921). The group agreed that psychological knowledge and methods could be of importance to the military and utilized to increase the efficiency of the Army and Navy personnel. The group included Robert Yerkes, who was also the president of the American Psychological Association. Yerkes made an appeal to members of APA who responded by

Training School in Vineland, New Jersey, on May 28. The committee considered many types of group tests and several that Arthur S. Otis developed when working on his doctorate under Lewis Terman at Stanford University. The goal was to find tests that could efficiently evaluate a wide variety of men, be easy to administer in the group format, and be easy to score. By June 9, 1917, the materials were ready for an initial trial. Men who had some educational background and could speak English were administered the verbal and quantitative (Alpha) tests and those that could not read the newspaper or speak English were given the Beta tests (today described as nonverbal).

The Alpha tests were designed to measure general information (e.g., how many months are

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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
- Black children earned higher scores on CAS than whites
- Fewer Black children would be identified as having intellectual disability using CAS than WISC-III

Think and Talk in CORE group

&

- Did PASS scores change your mind about Alejandro? How?
- What big "Ah Ha" did you have?
- Your thoughts…

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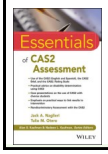
Race Differences

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

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



Note: The data for these results are reported for the Stanford-Binet IV from Wasserman (2000); Woodcock-Johnson III from Edwards and Oakland (2006); Kaufman Assessment Battery for Children from Naglieri (1986); Kaufman Assessment Battery for Children II from Lichenberger, Sotelo-Dynega, and Kaufman (2009); CAS from Naglieri, Rojahn, Matto, and Aquilino (2005); CAS2 from Naglieri, Das, and Goldstein (2014a); and Wechsler Intelligence Scale for Children IV (WISC-IV) from O'Donnell (2009).

Effect of Verbal Knowledge on Ability

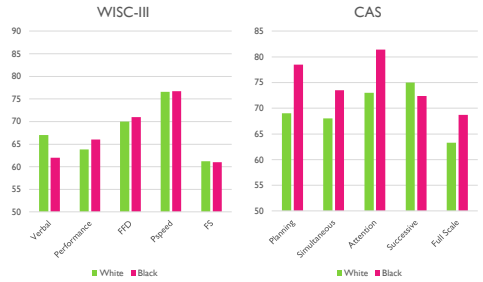
American Journal on Mental Retardation, 2001, Vol. 106, No. 4, 359-367

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

Naglieri & Rojahn (2001)



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Conclusions

- Traditional intelligence tests have changed very little *since 1917*
  - Verbal and quantitative test are too achievement laden and therefore they distort the IQ score
- "Second-generation intelligence tests" (KABC & CAS) do a much better job of *explaining current level of competence and predicting future performance; and they are better for diverse populations*

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

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Do you NEED Verbal tests

- Some have argued that verbal tests are more valid because they correlate high with achievement
  - That is a circular argument
- Do you need verbal tests to correlate with achievement?
  - The answer may surprise you ! !

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IQ Correlations with Achievement?

- IQ scores correlate about **.5 to .55** with achievement Intelligence (Brody, 1992)
- But traditional tests have achievement in them
- Naglieri (1999) summarized the correlations between several tests and achievement
  - The median correlation between each test's overall score and all achievement variables was obtained

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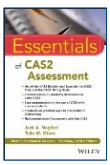
Correlations with Achievement

- Next, a summary of ability test correlations with achievement EXCLUDING the scales that clearly require knowledge
- The average correlations of the SCALES with achievement and those without achievement were obtained to avoid ***criterion contamination***…
- See Naglieri & Otero (2017)



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Correlations with Achievement

- Correlations between ability & achievement(Naglieri & Otero, 2017) show the strength of measuring basic psychological processes

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

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

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

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Presentation Outline

- Introduction
  - Using groups to stimulate thinking
  - How traditional IQ has influenced us
- A new way of thinking about intelligence
  - What is PASS theory of learning
  - How to measure PASS neurocognitive processes
- Case studies with instructional implications
- Final thoughts

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Intelligence in the 21st Century Conceptualized as brain function

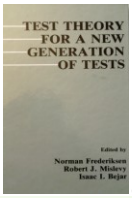
Our Amazing Brains !

IQ as Neurocognitive Abilities 1986

- Das and Naglieri proposed a neurocognitive theory of intelligence called PASS and a way to measure it (**C**ognitive **A**ssessment **S**ystem (Naglieri & Das, 1997) and the **CAS2** (Naglieri, Das, & Goldstein, 2014.)
  - The CAS was the first intelligence *test* to be built on a specific *theory* of intelligence.

Defining Neurocognitive Abilities

- How did we identify 'basic psychological processes'?
  - We used research from cognitive and neuropsychology to construct a model to test
  - We did not assign new labels to traditional IQ subtests
  - We recognized the limitations of developing a theory from factor analysis – "*a research program dominated by factor analyses of test intercorrelations is incapable of producing an explanatory theory of human intelligence*" (Lohman & Ippel, 1993, p. 41)



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From IQ to Brain Function

- Learning is based on BRAIN function
  - Wechsler (traditional IQ) was not based on the brain
  - We can now redefine intelligence as neurocognitive processes based on brain function (A. R. Luria)
- Reinvent understanding of intelligence based on the brain
  - Measure brain function, not IQ
  - Do not include achievement test questions
  - Measure ***thinking*** not ***knowledge***

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Knowledge vs. Thinking

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

- How does the student have to ***think*** to complete a task?
  - ***This is dependent on PASS neurocognitive processes***

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Presentation Outline

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- Case studies
- Final thoughts

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A Brain-Based view of Intelligence

and how this changes our view of students

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A Theory of Learning

28 Cognitive Assessment System: Redefining Intelligence From a Neuropsychological Perspective

Jack A. Naglieri and Tulio M. Otero

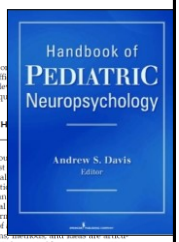
INTRODUCTION

Pediatric neuropsychology has become an important field for understanding and treating developmental, psychiatric, psychosocial, and learning disorders. By addressing both brain functions and environmental factors intrinsic in complex behaviors, such as thinking, reasoning, planning, and the variety of executive capacities, clinicians are able to offer needed services to children with a variety of learning, psychiatric, and developmental disorders. Brain–behavior relationships are investigated by neuropsychologists by interpreting several aspects of an individual's cognitive, language, emotional, social, and motor behavior. Standardized instruments are used by neuropsychologists to collect information and derive inferences about brain–behavior relationships. Technology, such as magnetic resonance imaging (MRI), functional MRI (FMRI), positron emission tomography, computerized tomography, and diffusion tensor imaging, has reduced the need for neuropsychological tests to localize and

Such tools should not

FROM NEUROPSYCH TO ASSESSMENT

Luria's theoretical



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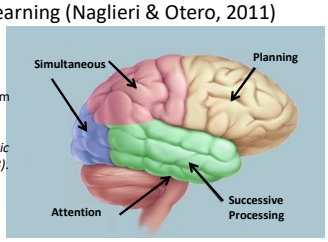
PASS Neurocognitive Theory

- The brain is the seat of abilities called PASS
- These neurocognitive processes are the foundation of learning (Naglieri & Otero, 2011)

Naglieri, J. A. & Otero, T. (2011). Cognitive Assessment System: Redefining Intelligence from A Neuropsychological Perspective. In A. Davis (Ed.). *Handbook of Pediatric Neuropsychology (320-333)*. New York: Springer Publishing.



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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 theory** is a way to measure neuro-cognitive abilities related to brain function

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Here's Where We're Going Today

- Planning
  - Attention
  - Successive
  - Simultaneous

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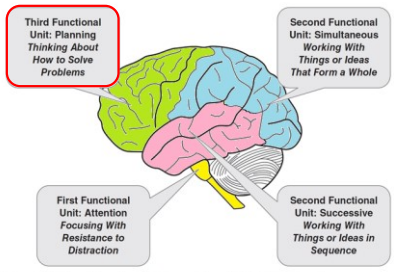
INTELLIGENCE CONCEPTUALIZED AS BRAIN FUNCTION



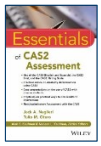


Figure 1.2 Three Functional Units and Associated Brain Structures

From: *Essentials of CAS2 Assessment*. Naglieri & Otero, 2017

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PASS Theory: Planning

- **Planning** is a neurocognitive process that a person uses to determine, select, and use efficient solutions to problems
  - problem solving
  - developing plans and using strategies
  - retrieval of knowledge
  - impulse control and self-control
- These can also be described as executive function, metacognition, strategy use

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Which Lemming has good Planning?

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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

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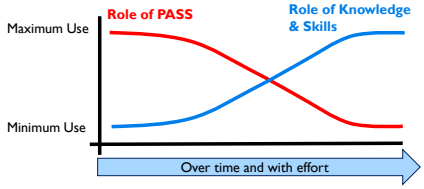
Planning Learning Curves

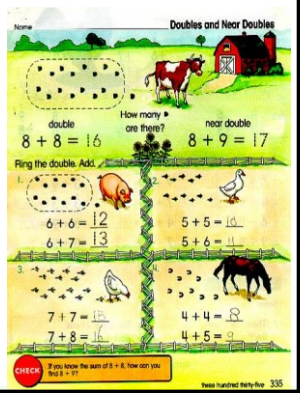
- Learning depends upon many factors especially PASS
- At first, PASS plays a major role in learning
- When a task is practiced and learned it requires less thinking (PASS) and becomes a skill



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

Math Strategies

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.



The Case of Rocky

Specific
Learning
Disability
and
ADHD

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The case of Rocky

- Rocky[1] is a real child with a real problem
- He lives in a large middle class school district
  - a wide variety of services are available
- In first grade Rocky was performing significantly below grade benchmarks in reading, math, and writing.
  - He received group reading instruction weekly and six months of individual reading instruction from a reading specialist
  - He made little progress and was retained

Note: This child's name and other potentially revealing data have been changed to protect his identity.

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The case of Rocky

- By the middle of his second year in first grade Rocky was having difficulty with
  - decoding, phonics, and sight word vocabulary; math problems, addition, fact families, and problem solving activities;
  - and focusing and paying attention."
- After two years of special team meetings and special reading instruction he is now working two grade levels below his peers and is having difficulty in reading, writing, and math
- A comprehensive evaluation was conducted

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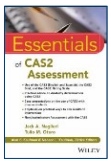
How to Analyze PASS scores



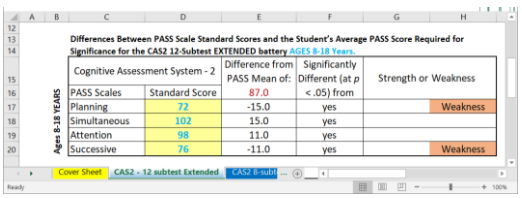
- Ipsative Approach with two rules
  - Low in relation to PASS average
  - Low in relation to the norm

Summary of the Rules

1. If a CAS2 scale's score is significantly different from the child's average, it is important for understanding personal strength or weakness.
2. If a CAS2 scale's score is significantly different from the child's average and it is below the 90 (the average range is 90–109), it is important for understanding personal strength or weakness, *and* it should be labeled a *weakness*.
3. If a CAS2 scale's score is significantly different from the child's average and it is above the 109 (the average range is 90–109), it is important for understanding personal strength or weakness, *and* it should be labeled a *strength*.

How to Analyze PASS scores

- For an excel spreadsheet that does the analysis of PASS scores go to PSW Calculator
  - http://www.jacknaglieri.com/case-studies.html



Differences Between PASS Scale Standard Scores and the Student's Average PASS Score Required for Significance for the CAS2 12-Subtest EXTENDED battery AGES 8-18 Years.

	Cognitive Assessment System - 2		Difference from PASS Mean of:	Significantly Different (at p < .05) from	Strength or Weakness
Ages 8-18 YEARS	PASS Scales	Standard Score	87.0		
	Planning	72	-15.0	yes	Weakness
	Simultaneous	102	15.0	yes	
	Attention	98	11.0	yes	
	Successive	76	-11.0	yes	Weakness

Cover Sheet | CAS2 - 12 subtest Extended | CAS2 8-subtt

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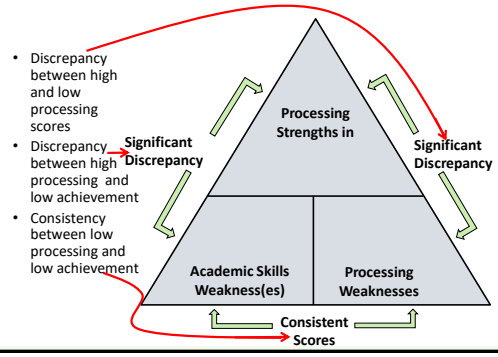
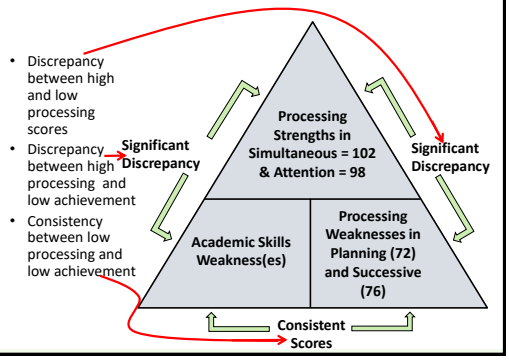
Discrepancy Consistency Model for Rocky

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



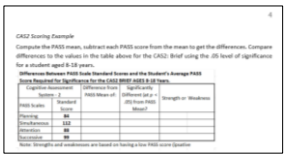
Discrepancy Consistency Model for Rocky

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



How to Find the PSW of PASS Scores

- See Pages 3 & 4 of the Think Smart Workbook
- Work the numbers



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How to Analyze PASS scores

DON'T FORGET 3.5

The essence of the Discrepancy/Consistency Method is two discrepancies and one consistency.

Discrepancy 1:
Significant variability among the PASS scores indicating a weakness in one or more of the basic psychological processes

Discrepancy 2:
Significant difference between high PASS scores and low achievement test scores

Consistency:
No significant difference between low PASS scores and low achievement

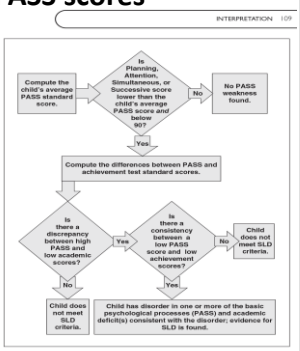
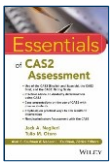


Figure 3.2 Steps for Using the Discrepancy/Consistency Method

Comparing PASS scores with other Achievement Tests

- See Naglieri & Otero (2017) tables



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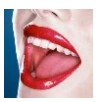
Think and Talk in CORE group

&



- Does the TRIANGLE make sense?
- How does it help you see the big picture?
- Your thoughts…

90

Here's Where We're Going Today

- Planning
- Attention
- Successive
- Simultaneous

91

Intelligence as Brain Function

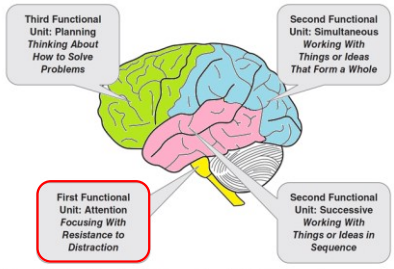


Figure 1.2 Three Functional Units and Associated Brain Structures

From: *Essentials of CAS2 Assessment*. Naglieri & Otero, 2017

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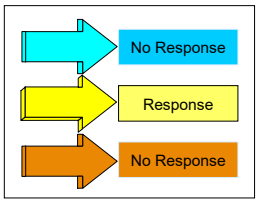
PASS Theory

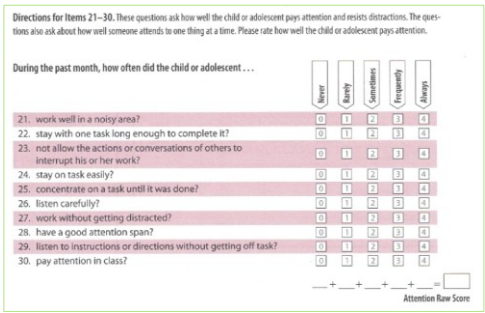
- **Attention** is a basic psychological process we use to selectively attend to some stimuli and ignores others
  - focused cognitive activity
  - selective attention
  - resistance to distraction

RED
BLUE



93

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

94

CAS2 Expressive Attention

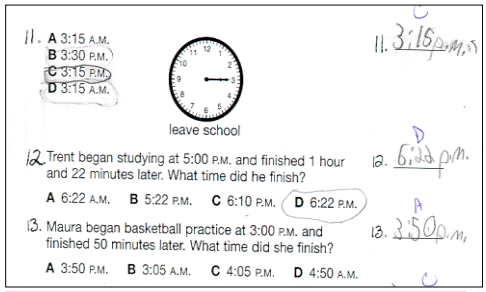
n

n

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

95

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.

Reading comprehension is difficult because of the similarity of the options

96

Frankie at age 11 years

- Referred by parents (at age 11) after a history of reading and self esteem problems
- High level of anxiety
  - he was too anxious to look closely at the words, and he would rather get the task completed and move on.
  - Frankie could not attend to the details of the sequence of letters for correct spelling, and the order of sound–symbol associations

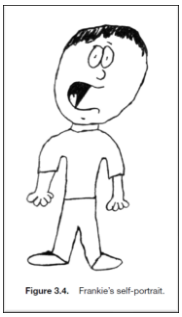


Figure 3.4. Frankie's self-portrait.

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PASS

- Work these PASS scores for Frankie, see what you get…

Table 3.3 Differences Between PASS Scale Standard Scores and the Student's Average PASS Score Required for Significance for the CAS2 Extended and Core Batteries, CAS2: Brief, and CAS2: Rating Scales

Scale	Age	*p*	Planning	Simultaneous	Attention	Successive
CAS2 Extended	5–7	.05	9.5	9.3	8.0	9.4
		.10	8.5	8.3	7.2	8.4
	8–18	.05	9.3	8.3	9.5	9.1
		.10	8.4	7.4	8.6	8.2
CAS2 Core	5–7	.05	11.2	10.1	9.0	10.7
		.10	10.1	9.0	8.1	9.6
	8–18	.05	10.2	9.1	10.9	10.4
		.10	9.2	8.1	9.8	9.3
CAS2: Brief	4–7	.05	9.9	11.5	9.4	12.0
		.10	8.9	10.3	8.5	10.8
	5–18	.05	9.1	10.8	11.3	11.8
		.10	8.2	9.7	10.1	10.6
CAS2: Rating Scale	5–7	.05	9.9	11.5	9.4	12.0
		.10	8.9	10.3	8.5	10.8
	8–18	.05	9.1	10.8	11.3	11.8
		.10	8.2	9.7	10.1	10.6

Differences Between PASS Scale Standard Scores and the Student's Average PASS Score Required for Significance for the CAS2 12-Subtest EXTENDED battery AGES 8-18 Years.

Ages 8-18 YEARS	Cognitive Assessment System - 2	Difference from PASS Mean of:	Significantly Different (at *p*	Strength or Weakness
	PASS Scales	Standard Score		
	Planning	94		
	Simultaneous	94		
	Attention	71		
	Successive	92		

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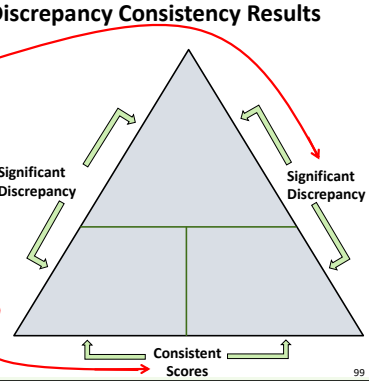
Frankie Discrepancy Consistency Results

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



99

Frankie Discrepancy Consistency Results

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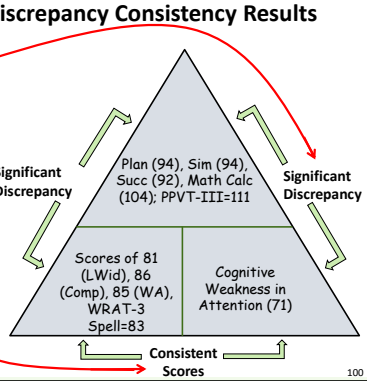
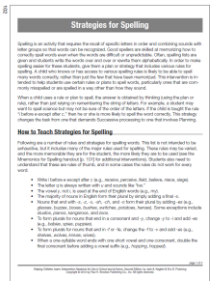


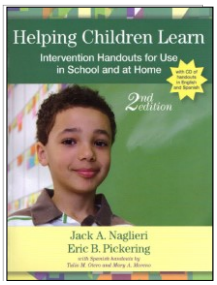
100

Frankie - Use Planning Strength



Strategies for Spelling

How to Teach Strategies for Spelling



Slides by Jack A. Naglieri, Ph.D.
(jnaglieri@gmail.com)

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Frankie – Metacognitive (Planning) Interventions

- Discourage passivity / encourage independence
  - Teacher should only provide as much assistance as is needed
  - Discourage exclusive use of teacher's solutions
  - Child needs to correct own work
  - Child needs to learn to be self-reliant (Scheid, 1993).

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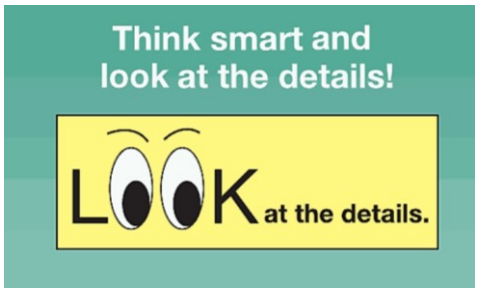
Focus: Am I paying attention?



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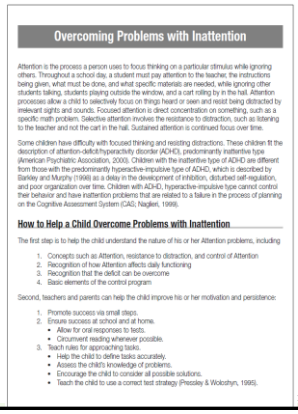
Frankie

Help Frankie better manage his attention problem



Overcoming Problems with Inattention

Attention is the process a person uses to focus thinking on a particular stimulus while ignoring others. Throughout a school day, a student must pay attention to the teacher, the instructions being given, what must be done, and what specific materials are needed, while ignoring other students talking, students playing outside the window, and a cart rolling by in the hall. Attention processes allow a child to selectively focus on things heard or seen and resist being distracted by irrelevant sights and sounds. Focused attention is direct concentration on something, such as a specific math problem. Selective attention involves the resistance to distraction, such as listening to the teacher and not the cart in the hall. Sustained attention is continued focus over time.

Some children have difficulty with focused thinking and resisting distractions. These children fit the description of attention-deficit/hyperactivity disorder (ADHD), predominantly inattentive type (American Psychiatric Association, 2000). Children with the inattentive-type of ADHD are different from those with the predominantly hyperactive-impulsive type of ADHD, which is described by Barkley and Murphy (1998) as a delay in the development of inhibition, disturbed self-regulation, and poor organization over time. Children with ADHD, hyperactive-impulsive type cannot control their behavior and have inattention problems that are related to a failure in the process of planning on the Cognitive Assessment System (CAS; Naglieri, 1999).

How to Help a Child Overcome Problems with Inattention

The first step is to help the child understand the nature of his or her Attention problems, including

1. Concepts such as Attention, resistance to distraction, and control of Attention
2. Recognition of how Attention affects daily functioning
3. Recognition that the deficit can be overcome
4. Basic elements of the control program

Second, teachers and parents can help the child improve his or her motivation and persistence:

1. Promote success via small steps.
2. Ensure success at school and at home.
   - Allow for oral responses to tests.
   - Circumvent reading whenever possible.
3. Teach rules for approaching tasks.
   - Help the child to define tasks accurately.
   - Assess the child's knowledge of problems.
   - Encourage the child to consider all possible solutions.
   - Teach the child to use a correct test strategy (Pressley & Woloshyn, 1995).

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Frankie - Interventions

- Teach rules for approaching tasks
  - Define tasks accurately
  - Assess child's knowledge of the problem
  - Consider ALL possible solutions
  - Evaluate value of all possible solutions
  - Checking work carefully is required
  - Correct your own test strategy (see Pressley & Woloshyn, 1995, p. 140).

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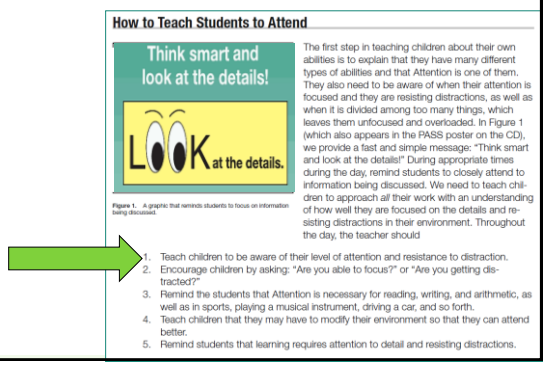
What Should Teachers & Parents do?



How to Teach Students to Attend

Figure 1. A graphic that reminds students to focus on information being discussed.

The first step in teaching children about their own abilities is to explain that they have many different types of abilities and that Attention is one of them. They also need to be aware of when their attention is focused and they are resisting distractions, as well as when it is divided among too many things, which leaves them unfocused and overloaded. In Figure 1 (which also appears in the PASS poster on the CD), we provide a fast and simple message: "Think smart and look at the details!" During appropriate times during the day, remind students to closely attend to information being discussed. We need to teach children to approach *all* their work with an understanding of how well they are focused on the details and resisting distractions in their environment. Throughout the day, the teacher should

1. Teach children to be aware of their level of attention and resistance to distraction.
2. Encourage children by asking: "Are you able to focus?" or "Are you getting distracted?"
3. Remind the students that Attention is necessary for reading, writing, and arithmetic, as well as in sports, playing a musical instrument, driving a car, and so forth.
4. Teach children that they may have to modify their environment so that they can attend better.
5. Remind students that learning requires attention to detail and resisting distractions.

Frankie and Successive Processing

- **Spelling**
  - Strategies for Spelling (pp.102–103)
  - Segmenting Words for Reading/Decoding and Spelling (p. 89)
- These are designed to help him perform better when tasks require a lot of Successive processing.

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Let's Take a Mindful Moment or Brain Break (or Syn-nap)

The brain needs time **to process!**

- Stretch
- Cross Laterals
- Walk and Talk
- Energizers
- Relaxers

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Is Frankie a Typical ADHD Child?

Note the Hyperactive-Impulsive Type

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Case of Christopher - Is He ADHD?

- Problems
  - behavior problems
  - impulsive & disorganized
  - forgets assignments
  - can't stay on task
  - poor grades
- Clinical Observations
  - anxious about testing
  - used simple strategies
  - did sloppy work
  - control problems (threw pencil when frustrated)
  - impulsive choices made

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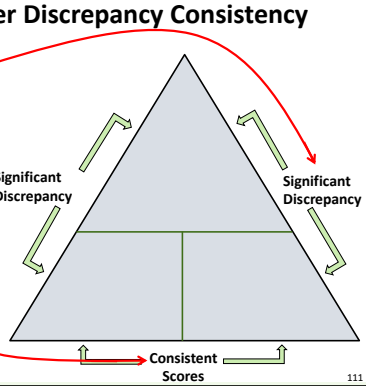
Christopher Discrepancy Consistency

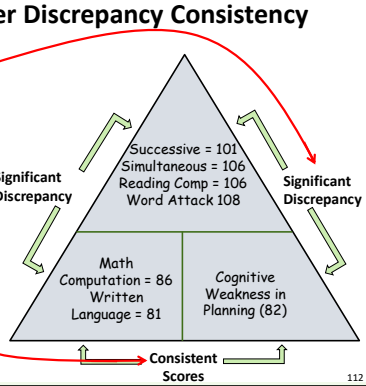
- **Discrepancy** between high and low processing scores
- **Discrepancy** between high processing and low achievement
- **Consistency** between low processing and low achievement



111

Christopher Discrepancy Consistency

- **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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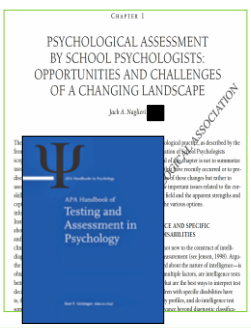
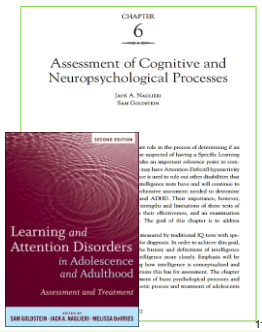
Which Tests have Useful Profiles ?

http://www.jacknaglieri.com/cas2.html





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Slides by Jack A. Naglieri, Ph.D. (jnaglieri@gmail.com)

Naglieri & Goldstein (2011)

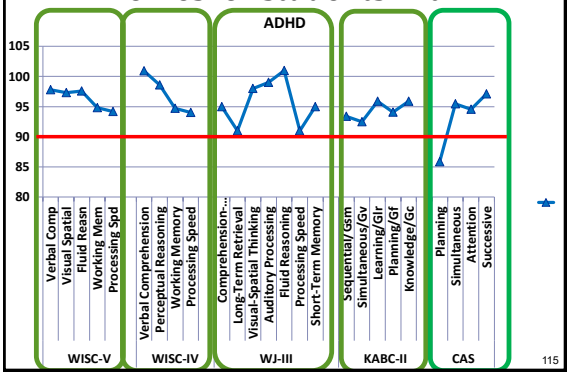
GROUP PROFILES BY ABILITY TEST

Because ability tests play such an important role in the diagnostic process, it is crucial to understand the sensitivity each test may have to any unique characteristics of those with an SLD or attention deficit. Clinicians need to know if an adolescent or adult has a specific deficit in ability that is related to a specific academic learning problem. There has been considerable research on, for example, Wechsler subtest profile analysis, and most researchers conclude that no profile has diagnostic utility for individuals with SLD or ADHD (Kavale & Forness, 1995). The failure of subtest profiles has led some to argue (e.g., Naglieri, 1999) that scale, rather than subtest, variability should

1. We need to know if intelligence tests yield distinctive profiles

2. Subtest profile analysis is UNSUPPORTED so use scale profiles instead

Profiles for students with ADHD



Canivez & Gaboury (2010)

- "the present study demonstrated the potential of the CAS to correctly identify students who demonstrated behaviors consistent with ADHD diagnosis." glcanivez@eiu.edu

Cognitive Assessment System Construct and Diagnostic Utility in Assessing ADHD

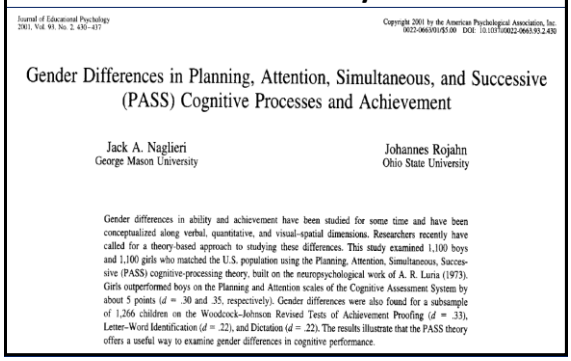
Gary L. Canivez, Eastern Illinois University; Allison B. Gaboury, Puyallup School District, Puyallup, WA

Paper presented at the 2010 Annual Convention of the American Psychological Association, San Diego, CA

Sex Differences & PASS

Who do you think is better in PLANNING and Attention; Boys or Girls?

Sex Differences: Ability



Journal of Educational Psychology
2001, Vol. 93, No. 2, 430–437

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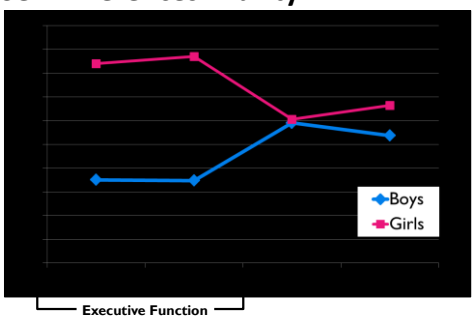
0022-0663/01/$5.00 DOI: 10.1037//0022-0663.93.2.430

Gender Differences in Planning, Attention, Simultaneous, and Successive (PASS) Cognitive Processes and Achievement

Jack A. Naglieri, George Mason University
Johannes Rojahn, Ohio State University

Gender differences in ability and achievement have been studied for some time and have been conceptualized along verbal, quantitative, and visual–spatial dimensions. Researchers recently have called for a theory-based approach to studying these differences. This study examined 1,100 boys and 1,100 girls who matched the U.S. population using the Planning, Attention, Simultaneous, Successive (PASS) cognitive-processing theory, built on the neuropsychological work of A. R. Luria (1973). Girls outperformed boys on the Planning and Attention scales of the Cognitive Assessment System by about 5 points (d = .30 and .35, respectively). Gender differences were also found for a subsample of 1,266 children on the Woodcock–Johnson Revised Tests of Achievement Proofing (d = .33), Letter–Word Identification (d = .22), and Dictation (d = .22). The results illustrate that the PASS theory offers a useful way to examine gender differences in cognitive performance.

Sex Differences: Ability



When Disobedience Reflects PASS

- 6-year girl in Kindergarten.
  - Attention problems and resistance to comply.
  - Delayed speech – she could comprehend but didn't speak until almost 3. Has received SLP services since 2.5.
- Occupational therapy evaluation
  - difficulty with attention to task, processing auditory information, fine motor precision, visual motor integration, self-care skills, coordination, and decreased muscle strength of both core musculature and intrinsic muscle of hand.
-

When Disobedience Reflects PASS

- Mom reports:
  - she can be shy and is easily frustrated when she can't perform as well as others.
- Teacher
  - strengths in creativity and art. Teacher is very concerned with *attention and non-compliance*. She is also working with her to improve friendship skills – she tries to control.
- Testing behavior
  - Has a desire to perform well but *requires boundaries* and set reward times in order to obtain consistent effort.
  - Impulsive and tries to control situation. Much movement including putting feet on the chair, laying on the table, and out of her seat.

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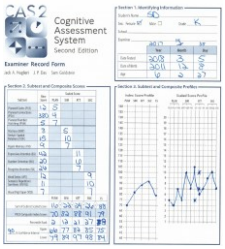
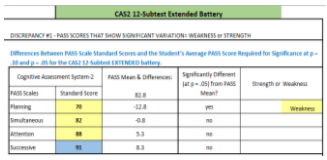
When Disobedience Reflects PASS

- Weakness in Planning
- Weak scores in
  - Semantic Concepts (85)
  - Positioning of Sounds (75)
  - Orthographical Processing (85)
  - Addition and Subtraction knowledge (75)
- RIAS Verbal (103) & Nonverbal (108)
- Tea-ch 2 scores are low in Selective Attention (70), Sustained Attention (83) Everyday Attention = 72





CAS2 12-Subtest Extended Battery

DISCREPANCY #1 - PASS SCORES THAT SHOW SIGNIFICANT VARIATION= WEAKNESS or STRENGTH

Differences Between PASS Scale Standard Scores and the Student's Average PASS Score Required for Significance at p = .10 and p = .05 for the CAS2 12-Subtest EXTENDED battery.

Cognitive Assessment System-2		PASS Mean & Differences:	Significantly Different (at p = .05) from PASS Mean?	Strength or Weakness
PASS Scales	Standard Score	82.8		
Planning	70	-12.8	yes	Weakness
Simultaneous	82	-0.8	no	
Attention	88	5.3	no	
Successive	91	8.3	no	

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When Disobedience Reflects PASS

- When you find a child low in Planning who is described as being difficult to control, is impulsive and has lots of 'bad' behavior
  - Low Planning means the student can't figure out how to meet the demands of life.
  - Low Planning means *resistance to change*
  - *Low planning may look like oppositional/defiant behaviors*
  - Don't be the student's frontal lobes
  - Give enough structure but NOT too much

123

Here's Where We're Going Today

- Planning
- Attention
- Successive
- Simultaneous

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INTELLIGENCE CONCEPTUALIZED AS BRAIN FUNCTION

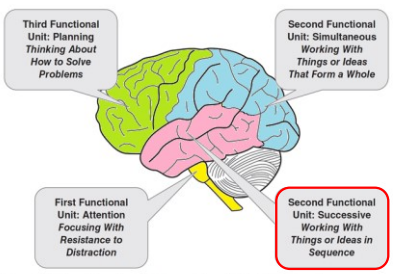

Figure 1.2 Three Functional Units and Associated Brain Structures
From: *Essentials of CAS2 Assessment*. Naglieri & Otero, 2017

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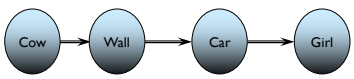
PASS: Successive

- **Successive** processing is used whenever we do something in a specific serial order
  - Anything we comprehend, speak, or do in a sequence requires successive processing



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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

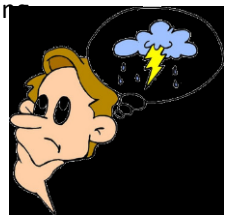
__ + __ + __ + __ + __ = ☐

Successive Raw Score

127

Insights…

- Even thought tasks were different in content and modality, they required the same kind of thinkin



128

PASS Theory: Successive

- **Successive** processing is used when information is in a specific serial order
  - Decoding words
  - Letter-sound correspondence
  - Phonological tasks
  - Understanding the syntax of sentences
  - Comprehension of written instructions
  - Sequence of words, sentences, paragraphs
  - Remembering the sequence of events in a story that was read

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Successive and Syntax

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

130

Phonemic Awareness = Successive

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

Blending: Advantage

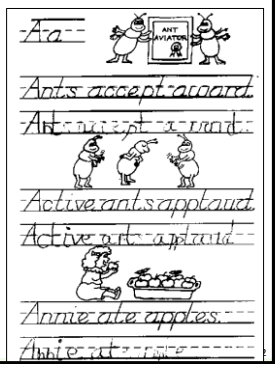
Item	Correct response	# of syllables	Score
ad : van : tage	advantage	3	0 1

From the Feifer Assessment of Reading (2016)

131

Successive Reading Practices

The sequence of the sounds is emphasized in this work sheet



Successive Processing & Reading Decoding

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

13
3

PASS - ADHD and SLD weaknesses

- Students with SLD in Reading Decoding, Spelling, phonological skill deficits and related problems have difference PASS profiles from those with ADHD

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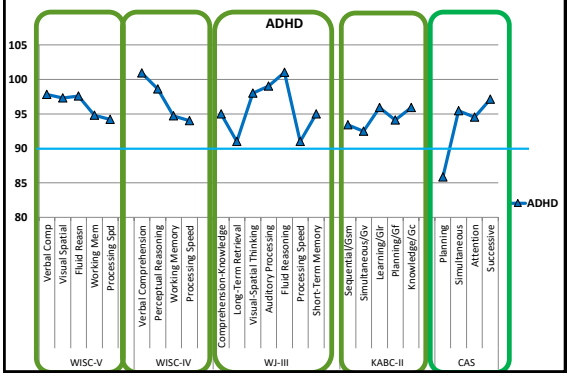
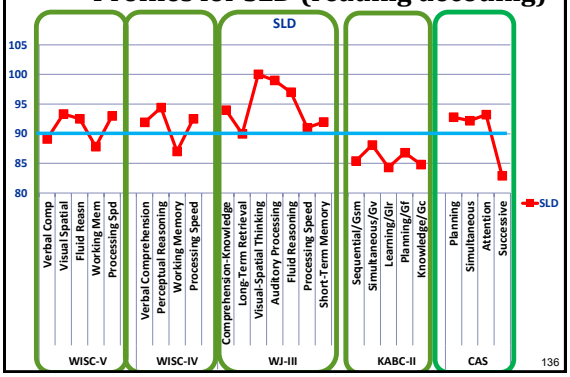
Profiles for students with ADHD

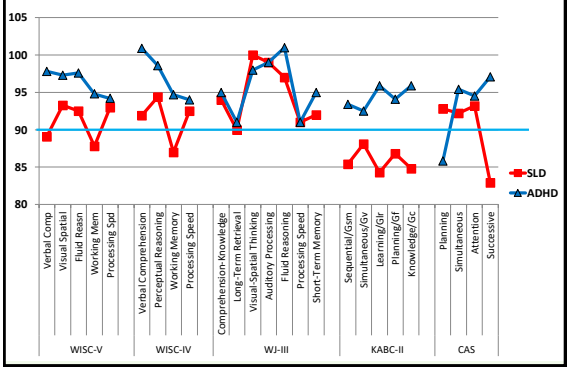


Profiles for SLD (reading decoding)



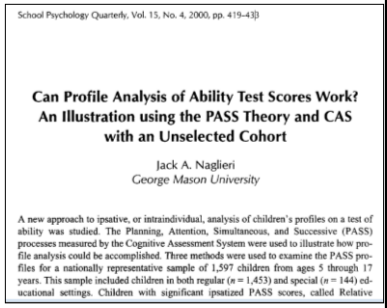
136

Profiles for SLD (reading decoding) & ADHD



PASS Profiles and Educational Placement

Students receiving special education were more than four times as likely to have at least one PASS weakness and a comparable academic weakness than those in regular education



School Psychology Quarterly, Vol. 15, No. 4, 2000, pp. 419–43[illegible]

Can Profile Analysis of Ability Test Scores Work? An Illustration using the PASS Theory and CAS with an Unselected Cohort

Jack A. Naglieri
George Mason University

A new approach to ipsative, or intraindividual, analysis of children's profiles on a test of ability was studied. The Planning, Attention, Simultaneous, and Successive (PASS) processes measured by the Cognitive Assessment System were used to illustrate how profile analysis could be accomplished. Three methods were used to examine the PASS profiles for a nationally representative sample of 1,597 children from ages 5 through 17 years. This sample included children in both regular (n = 1,453) and special (n = 144) educational settings. Children with significant ipsatized PASS scores, called Relative

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SLD Profiles on CAS (Huang, Bardos, D'Amato, 2010)

Identifying Students With Learning Disabilities: Composite Profile Analysis Using the Cognitive Assessment System

Journal of Psychoeducational Assessment
28(1) 19–30
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DOI: 10.1177/0734282909333057
http://jpa.sagepub.com
SAGE

Leesa V. Huang[1], Achilles N. Bardos[2], and Rik Carl D'Amato[3]

Abstract

The detection of cognitive patterns in children with learning disabilities (LD) has been a priority in the identification process. Subtest profile analysis from traditional cognitive assessment has drawn sharp criticism for inaccurate identification and weak connections to educational planning. Therefore, the purpose of this study is to use a new generation of cognitive tests with megacluster analysis to augment diagnosis and the instructional process. The Cognitive Assessment System uses a contemporary theoretical model in which composite scores, instead of subtest scores, are used for profile analysis. Ten core profiles from a regular education sample ($N = 1,692$) and 12 profiles from a sample of students with LD ($N = 367$) were found. The majority of the LD profiles were unique compared with profiles obtained from the general education sample. The implications of this study substantiate the usefulness of profile analysis on composite scores as a critical element in LD determination.

Johnson, Bardos & Tayebi, 2003

- "this study suggests that the CAS…yields information that contributes to the differential diagnosis of students suspected of having a learning disability in writing"

Journal of Psychoeducational Assessment
2003, 21, 180-195

DISCRIMINANT VALIDITY OF THE COGNITIVE ASSESSMENT SYSTEM FOR STUDENTS WITH WRITTEN EXPRESSION DISABILITIES

Judy A. Johnson
University of Houston - Victoria
Achilles N. Bardos
University of Northern Colorado
Kandi A. Tayebi
Sam Houston State University

This study explored the PASS cognitive processing theory in junior high students (aged 11-15 years) with and without written expression disabilities. Ninety-six students with (n = 48) and without (n = 48) written expression disabilities were administered the Das-Naglieri Cognitive Assessment System (DN:CAS; 1997) and the writing subtests of the Wechsler Individual Achievement Test (WIAT; 1992). Discriminant analyses were utilized to identify the DN:CAS subtests and composites that contributed to group differentiation. The Planning composite was found to be the most significant contributor among the four composite scores. Subsequent efficiency of classification analyses provided strong support for the validity of the obtained discriminant functions in that the four DN:CAS composite scale scores correctly identified 85% of the students as members of their respective groups.

Canivez & Gaboury (2010)

- "the present study demonstrated the potential of the CAS to correctly identify students who demonstrated behaviors consistent with ADHD diagnosis." glcanivez@eiu.edu

Cognitive Assessment System Construct and Diagnostic Utility in Assessing ADHD

Gary L. Canivez
Eastern Illinois University
Aileen R. Gaboury
Puyallup School District, Puyallup, WA

Paper presented at the 2010 Annual Convention of the American Psychological Association, San Diego, CA

Georgiou & Das (2013)

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University Students With Poor Reading Comprehension: The Hidden Cognitive Processing Deficit

George K. Georgiou, PhD[1] and J. P. Das, PhD[1]

Abstract

The present study aimed to examine the nature of the working memory and general cognitive ability deficits experienced by university students with a specific reading comprehension deficit. A total of 32 university students with poor reading comprehension but average word-reading skills and 60 age-matched controls with no comprehension difficulties participated in the study. The participants were assessed on three verbal working memory tasks that varied in terms of their processing demands and on the *Das–Naglieri Cognitive Assessment System*, which was used to operationalize intelligence. The results indicated first that the differences between poor and skilled comprehenders on working memory were amplified as the processing demands of the tasks increased. In addition, although poor comprehenders as a group had average intelligence, they experienced significant difficulties in simultaneous and successive processing. Considering that working memory and general cognitive ability are highly correlated processes, these findings suggest that the observed differences between poor and skilled comprehenders are likely a result of a deficient information processing system.

Think and Talk in CORE group

&

- Do the PASS patterns make sense?
- Does this information match what you have seen?
- Your thoughts…

Key Facts About Dyslexia

- Students with low Successive processing and specific reading decoding problems have one type of Dyslexia…
- What IS Dyslexia?

Key Facts About Dyslexia

- Dyslexia *is*
  - a specific learning disability - a disorder in one or more basic psychological process (i.e. **PASS**)
  - neurobiological in origin
  - Often associated with the phonological aspect of language
  - can impact either reading accuracy, reading fluency, or both
  - can develop despite sufficient instruction
  - not related to Wechsler Full Scale IQ scores

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Key Facts About Dyslexia

- There are four types of Dyslexia
  - **Dysphonetic Dyslexia**
  - ***Surface Dyslexia***
  - ***Mixed Dyslexia***
  - ***Reading Comprehension Deficits***

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Dysphonetic Dyslexia

- **Students with Dysphonetic Dyslexia have trouble…**
  - Blending letters and sounds, ordering sounds, decoding the sequence of sounds to make words
  - Decoding so they guess at words based on the initial letter
  - Spelling, and the result is poor reading comprehension
  - Learning math facts

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Dysphonetic Dyslexia

- **Case of Paul** -A 9 year old in 4th grade
  - Problems in reading and math
  - Can't remember the sequence of steps when doing math and math facts
  - Good memory for details
  - Can't sound out words
  - Poor spelling
  - Poor reading comprehension

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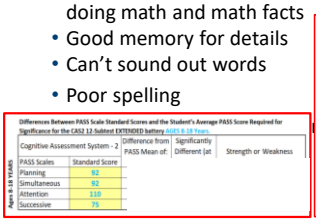
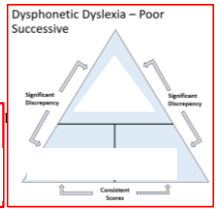
Dysphonetic Dyslexia

- **Case of Paul** -A 9 year old in 4th grade
  - Problems in reading and math
  - Can't remember the sequence of steps when doing math and math facts
  - Good memory for details
  - Can't sound out words
  - Poor spelling


Differences Between PASS Scale Standard Scores and the Student's Average PASS Score Required for Significance for the CAS2 12-Subtest EXTENDED battery Ages 8-18 Years.

Cognitive Assessment System - 2		Difference from PASS Mean of:	Significantly Different (at	Strength or Weakness
PASS Scales	Standard Score			
Planning	82			
Simultaneous	92			
Attention	110			
Successive	75			

Ages 8-18 YEARS



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Does Wechsler detect Dyslexia?

Case from Dr. Steve Feifer

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Paul – age 9 years

Presenting Concerns: Reading, Math Word Problems, Anxiety

WISCV	COMPOSITE SCORE	RANGE	PERCENTILE RANK
Verbal Comprehension	89	Below Average	23%
Visual Spatial	84	Below Average	14%
Fluid Reasoning	82	Below Average	12%
Working Memory	72	Very Low	3%
Processing Speed	76	Very Low	6%
FULL SCALE SCORE	81	Below Average	10%
WIAT III Reading	87	Below Average	19%
WIAT III Math	90	Average	25%
WIAT III Writing	94	Average	34%

Paul – age 9 years

CAS-2	STANDARD SCORE	Classification
Planning: the ability to apply a strategy, and self-monitor and self- correct performance while working toward a solution.	92	Average
Attention: the ability to selectively focus on a stimulus while resisting distractions.	110	Average
***Simultaneous Processing*-** is the ability to solve problems by integrating separate elements into a conceptual whole.	92	Average
***Successive Processing*-** is the ability to put information into a serial order or particular sequence.	72	Very Low
CAS-2 Full Scale	75	Below Average

How well does Paul do on phonological tests?

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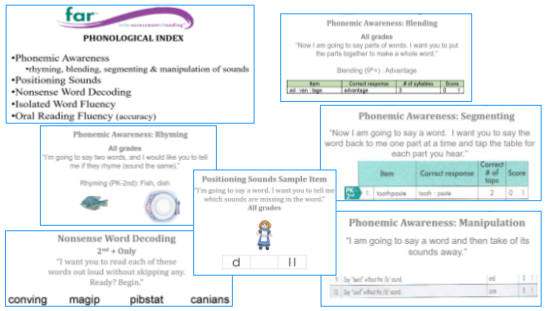
FAR Phonological Index Subtests



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Paul – age 9 years

FAR index	Standard score (95% CI)	Percentile	Qualitative descriptor
Phonological Index	75	5%	Moderately Below Average
Fluency Index	92	30%	Average
Mixed Index	81	10%	Below Average
Comprehension Index	97	42%	Average
FAR Total Index	**84**	**14%**	**Below Average**

KEY INTERPRETATION	Score	Percentile	Descriptor
Nonsense Word Decoding – requires the student to decode a series of nonsense words presented in order of increasing difficulty .	71	3%	Moderately Below Average
Irregular Word Reading Fluency – the student reads a list of phonologically irregular words arranged in order of increasing difficulty in 60 seconds.	95	37%	Average

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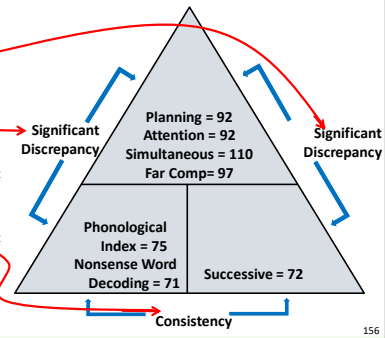
Discrepancy Consistency Method - Paul

Poor Successive + Poor Phonological = SLD in Reading Decoding

- 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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Here's Where We're Going Today

- Planning
- Attention
- Successive
- Simultaneous

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PASS DEEPER DIVE: INTELLIGENCE CONCEPTUALIZED AS BRAIN FUNCTION

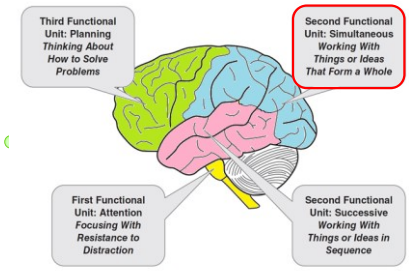

Figure 1.2 Three Functional Units and Associated Brain Structures

From: *Essentials of CAS2 Assessment*. Naglieri & Otero, 2017

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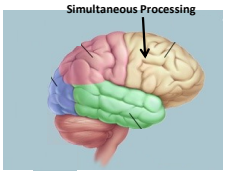
PASS Theory

- **Simultaneous** processing is used to integrate stimuli into groups
  - Stimuli are seen as a whole
  - Each piece must be related to the other
  - Whole language
  - Seeing word as a whole
  - Verbal concepts
  - Geometry, math word problems



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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

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Test Yourself !

Solve these analogies:

Girl is woman as boy is to _____?

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

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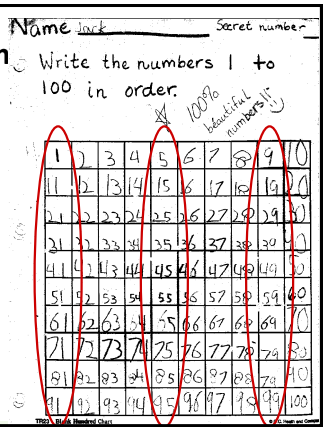
Numbers from 1 to 100

Simultaneous processing facilitated by this work sheet



Key Facts About Dyslexia

- There are four types of Dyslexia
  - **Dysphonetic Dyslexia**
  - ***Surface Dyslexia***
  - ***Mixed Dyslexia***
  - ***Reading Comprehension Deficits***

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Surface Dyslexia

- Students with **Surface Dyslexia…**
  - Have trouble with the spatial aspect of words
  - Read by breaking down words to individual phonemes and read very slowly
  - they tend to read letter-by-letter and sound-by-sound and they rely too heavily on the phonological properties of the word
  - Fluency suffers but phonological processing skills remain relatively intact.

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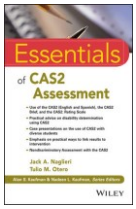
Case of Nelson (Naglieri & Feifer, 2017, Intervention Chapter 5)

- Nelson (9 year-old 4th grader) for 3 years
  - difficulty with spelling and written language math facts, and inconsistent with reading comprehending skills.
  - difficulty keeping pace with his peers and often failed to complete his work in a timely manner.
  - The Child Development Team (CDT) recommended a comprehensive psychological evaluation.



165

Case of Nelson (Naglieri & Feifer, 2017)

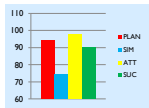
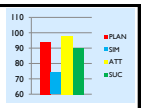


Table 5.2 Nelson's CAS2 Scoring

PASS Scales	Scaled Score	Percentile	Ability Range
CAS2 Planning: The ability to apply a strategy and self-monitor performance while working toward a solution	94	34	Average
CAS2 Attention: The ability to selectively focus on a stimulus while inhibiting responses from competing stimuli	98	45	Average
CAS2 Simultaneous Processing: The ability to reason and problem-solve by integrating separate elements into a conceptual whole, often involving visual-spatial tasks	74	4	Very low
CAS2 Successive Processing: The ability to put information into a serial order or particular sequence	90	25	Average
CAS2 Total Composite Score	89	23	Below average

166

Case of Nelson (Naglieri & Feifer, 2017)



Differences Between PASS Scale Standard Scores and the Student's Average PASS Score Required for Significance for the CAS2 12-Subtest EXTENDED battery AGES 8-18 Years.

Cognitive Assessment System - 2		Difference from PASS Mean of:	Significantly Different (at $p < .05$) from	Strength or Weakness
PASS Scales	Standard Score	88.8		
Planning	94	5.3	no	
Simultaneous	74	-14.8	yes	Weakness
Attention	98	9.3	no	
Successive	89	0.3	no	

Ages 8-18 YEARS

Notes

1. A Weakness is defined as PASS standard score that is significantly below the child's average PASS score (ipsative comparison at the .05 level) *and* the PASS score is below 90 (i.e. below the Average range).
2. A Strength is defined as PASS standard score that is significantly above the child's average PASS score (ipsative comparison at the .05 level) *and* the PASS score is above 109 (i.e. above the Average range).

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Case of Nelson (Naglieri & Feifer, 2017)

Table 5.6 Nelson's Scores on the Feifer Assessment of Reading (FAR)

FAR Index	Standard Score (95% CI)	Percentile	Qualitative Descriptor
Phonological Index	90 (±5)	25	Average
Fluency Index	73 (±7)	3	Moderately below average
Mixed Index	81 (±5)	10	Below average
Comprehension Index	97 (±8)	42	Average
FAR Total Index	84 (±5)	14	Below average

Table 5.3 Nelson's Scores on the KTEA-III Reading Subtests

Reading	Age Norms	Percentile	Range
Reading Comprehension: The student reads a word and points to its corresponding picture or reads a simple instruction and responds by performing the action.	83 ± 10	13	Below average
Silent Reading Fluency: The student is required to read as many statements as possible in 2 minutes and must respond either "yes" or "no" as to whether each statement is valid.	80 ± 11	9	Below average
KTEA-III Reading Composite Score	81 ± 6	10	Below average

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Case of Nelson (Naglieri & Feifer, 2017)

Table 5.4 Nelson's Scores on the KTEA-III Math Subtests

Math	Age Norms	Percentile	Range
Math Computation: The student solves math equations in the response booklet including addition and subtraction.	87 ± 10	19	Below average
Math Fluency: This is a timed task requiring the student to solve as many single-digit addition, subtraction, multiplication, and division problems in a minute.	89 ± 11	23	Below average
KTEA-III Math Composite Score	90 ± 6	25	Average
Spelling: The student is required to spell words of increasing difficulty dictated by the examiner.	86 ± 5	18	Below average
Writing Fluency: The student has 5 minutes to write as many sentences as possible describing various pictures.	88 ± 14	21	Below average
KTEA-III Written Language	87 ± 6	19	Below average

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Case of Nelson (Naglieri & Feifer, 2017)

- Nelson's history of reading problems and interventions to address this, slower reading speed, difficulty reading phonetically irregular words, and poor **Simultaneous**

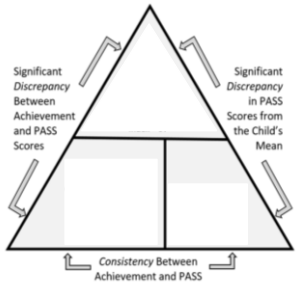

Figure 5.5 Nelson's Discrepancy/Consistency Method of SLD Results

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Mixed Dyslexia

- Students with **Mixed Dyslexia** have the most severe type of dyslexia
  - They have difficulty characterized by a combination of poor phonological processing skills, slower rapid and automatic word-recognition skills, inconsistent language comprehension skills, and odd error patterns in their reading.
  - **Main PASS processing problem(s): *Simultaneous and Successive***

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Reading Comprehension Deficit

- These students with **Reading Comprehension Deficits**
  - Are OK with word identification skills
  - But they can't get meaning from what they read
  - They have poor language and vocabulary development, attention difficulties, and/or limitations with planning and organization skills
  - They have few strategies for reading
  - **Main Pass processes: *Planning & Attention*.**

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Presentation Outline

- Introduction
  - Using groups to stimulate thinking
  - How traditional IQ has influenced us
- A new way of thinking about intelligence
  - What is PASS theory of learning
  - How to measure PASS neurocognitive processes
- Case studies
- Final thoughts

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PASS Comprehensive System

(Naglieri, Das, & Goldstein, 2014)

CAS2 Rating Scale (4 subtests)	CAS2 Brief (4 subtests)	CAS2 Core (8 subtests)	CAS2 Extended (12 subtests)
Total Score Planning Simultaneous Attention Successive	Total Score Planning Simultaneous Attention Successive	Full Scale Planning Simultaneous Attention Successive	Full Scale Planning Simultaneous Attention Successive Supplemental Scales Executive Function Working Memory Verbal / Nonverbal Visual / Auditory



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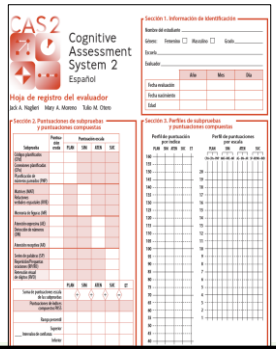
CAS2 for (Ages 5-18 yrs.)

CAS2 Español (Ages 5-18 yrs.)



CAS2

- 8 (40 minutes) or 12 (60 minutes) subtest versions
- PASS and Full Scales provided (100 & 15) subtests (10 and 3)

Figure 2.1. Completed pages of the Examiner Record Form for William.

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How to use Supplemental Scales

- We have these scores so you can relate findings on CAS2 to other tests
- Executive Function
- Working Memory
- Verbal
- Nonverbal
- Visual - Auditory comparison

Supplemental Composite Scores

Subtest	Scaled Score: EF w/o WM	EF w/ WM	WM	VC	NvC
Planned Codes					7
Planned Connections	8	8			
Matrices					10
Verbal-Spatial Relations		11	11	11	
Figure Memory					10
Expressive Attention	9	9			
Receptive Attention				9	
Sentence Repetition/Questions		7	7	7	

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How to use Supplemental Scales

- Executive Function (EF)
  - This scale provides a measure of the child's ability to achieve a goal by planning and organizing a task while paying careful attention to the stimuli and resisting distractions in the environment.
    - Relate this score to behavior rating scales of EF such as the Comprehensive Executive Function Inventory (Naglieri & Goldstein, 2015) and social skills
    - Look for academic problems in math, reading comprehension, written composition, homework, etc.

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How to use Supplemental Scales

- Working Memory
  - Baddeley and Hitch (1974) noted that WM involves the phonological loop and visual-spatial sketchpad.
  - Engle and Conway (1998) described the visual-spatial sketchpad as a mental image of visual and spatial features; and the phonological loop refers to retention of information when order of information is required
- Be careful not to assume that CAS2 WM score will = WISC-V WM score (Digit Span, Picture Span)

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How to use Supplemental Scales

- Verbal
  - This scale measures the child's ability to process information that requires recall and/or comprehension of verbal concepts or words across the Simultaneous, Successive, and Attention subtests
- It may be different from the WISC-V Verbal scale because the CAS2 Verbal scale does not require as much knowledge as the Similarities and Vocabulary tests do

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How to use Supplemental Scales

- Nonverbal
- This score measures the child's ability to process information with images across the Simultaneous and Planning scales.
- It may be different from the WISC-V Nonverbal scale because Wechsler subtests used (Block Design, Visual Puzzles, Matrix Reasoning, Figure Weights, Picture Span and Coding) are very diverse in their content

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How to use Supplemental Scales

- Visual - Auditory comparison
  - Scores on the Word Series and Visual Digit Span subtests are used to investigate the role visual or aural presentation of stimuli may have in the student's ability to remember information that is arranged in a specific order.
  - This tests the hypothesis that a student learns better by seeing or hearing

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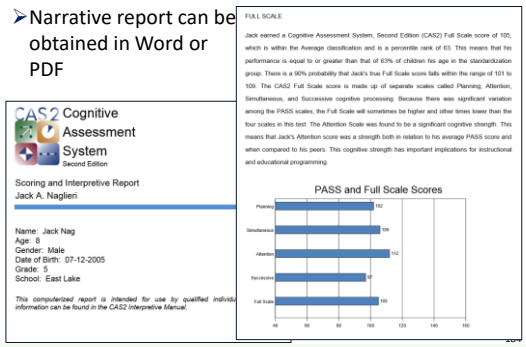
CAS2 Online Score & Report

- Narrative report can be obtained in Word or PDF



CAS2: Brief for Ages 4-18 years

CAS2: Brief

- Give in 20 minutes
- **Good for reevaluations**
- Yields PASS and Total standard scores (Mn 100, SD 15)
- All items are different from CAS2
  - Planned Codes
  - Simultaneous Matrices
  - Expressive Attention
- New Subtest
  - Successive Digits (forward only)

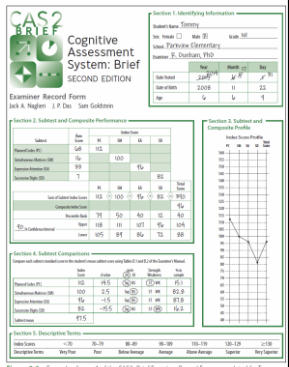


Figure 3.1. Example of page 1 of the CAS2: Brief Examiner Record Form, completed for Tommy.

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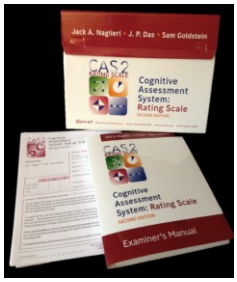
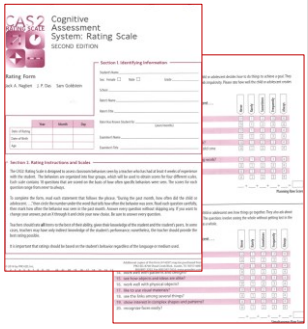
CAS2 Rating Scales (Ages 4-18 yrs.)

- The CAS2: Rating measures behaviors associated with PASS constructs
- Normed on a nationally representative sample of 1,383 students rated by teachers



CAS2 Rating Scales

- The CAS2: Rating form contains 40 items
- 10 items for each PASS scale
- PASS and Total scales are set to have a mean of 100 and standard deviation of 15



CAS2 Rating Scales

- The rater is given a description of what each scale is intended to measure.
- This informs teachers about PASS

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.

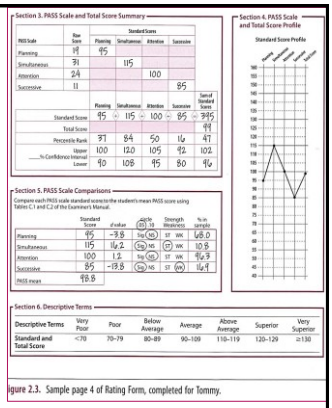
Directions for Items 11–20. These questions ask how well the child or adolescent sees how things go together. They also ask about working with diagrams and understanding how ideas fit together. The questions involve seeing the whole without getting lost in the parts. Please rate how well the child or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

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.

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.

CAS2 Rating Scales

- The CAS2: Rating Scale scores can be used as part of a larger comprehensive evaluation or for instructional planning



igure 2.3. Sample page 4 of Rating Form, completed for Tommy.

Presentation Outline

- Introduction
  - Using groups to stimulate thinking
  - How traditional IQ has influenced us
- A new way of thinking about intelligence
  - What is PASS theory of learning
  - How to measure PASS neurocognitive processes
- Case studies
- Final thoughts

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Case of María

(Case of Dr. Mary A. Moreno)

CASE STUDY: MARIA (C.A. 13-8 GRADE 8)

REASON FOR REFERRAL

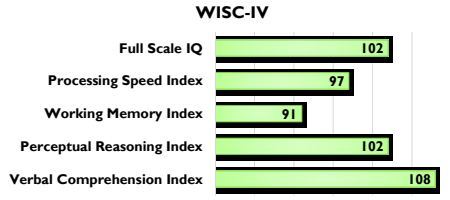
➢ Academic:

- Delays in mathematical skills
  - Mainly in fractions
  - Difficulties in multiplication
- Reading and writing
  - Poor reading fluency (slow or "tired" while reading)
  - Mistakes when reading aloud, repeats, stops often or "gets lost" when reading
  - Reads without expression and ignores punctuation marks
  - Organizational problems in reading and writing
  - Writes very slowly

WISC-IV

➢ 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



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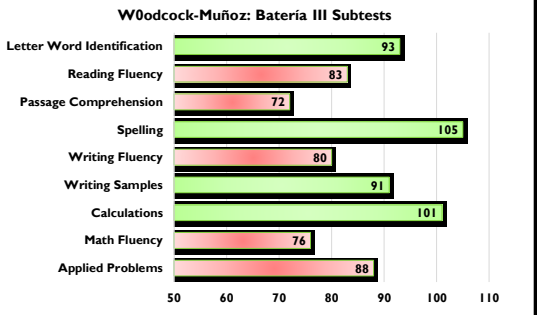
Achievement



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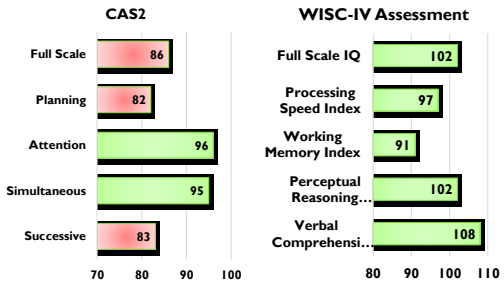
PASS with CAS2 Spanish



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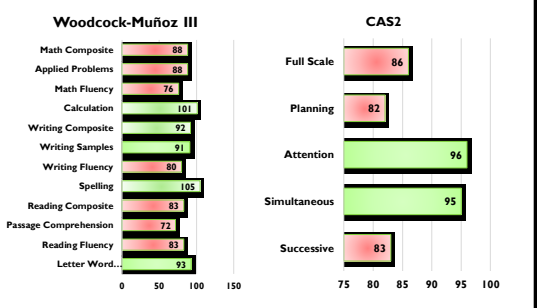
María's Results



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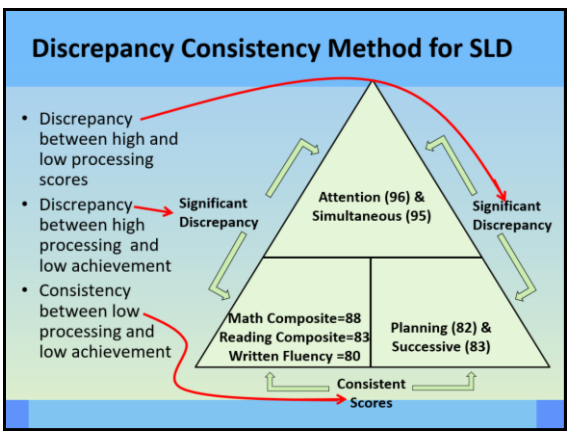
Discrepancy Consistency Method for SLD



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

- 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 and Attention = 96
- She has documented:
  - Academic difficulties – math and reading fluency
  - Behavioral difficulties – Anxiety
  - Planning (aka, Executive functioning) difficulties – Organization, self-monitoring

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

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

Light Through a Dark Forest: A Practitioner's Perspective

- **If my assessment helps guide teachers to more efficiently and effectively educate learning challenged students, I have accomplished my goal.**
- PASS scores help me see learning disabilities better than Wechsler
- PASS gives a basis for understanding strengths and weaknesses and how to effectively target intervention

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Case of Teya by Jana Parker School Psychologist Menlo Park City School District

Slow learner, ID or SLD?

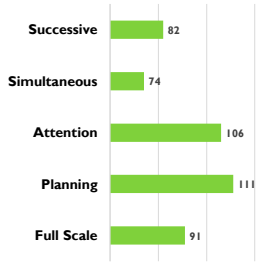
CASE STUDY: Teya (C.A. 10-7 GRADE 5)

REASON FOR REFERRAL

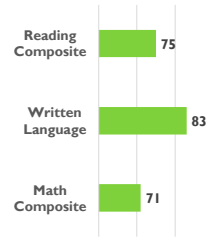
- Concerns and Supports:
  - Eligible under SLD/SLI (SLD despite only strength on Visual Spatial Index of WISC V)
  - Functioning around 2nd grade in all academic areas
  - Receiving reading, writing, and math tutoring
  - OT for fine and gross motor
  - Language therapy since preschool
  - Social immaturity

CAS2 and WJ IV Scores

- CAS2



- Achievement WJ



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Using PASS to Understand Challenges

- WJ IV Writing Prompt:
  - Use one good sentence to tell three things you would like to do on a sunny day.

"I whode love to sleep on a sunny day because I am to lazze to go to the beach."

- **Spelling issues due to simultaneous processing problems (surface dyslexia)**
- **Followed only one part of the prompt, due to simultaneous processing problems, not integrating all pieces to the whole**

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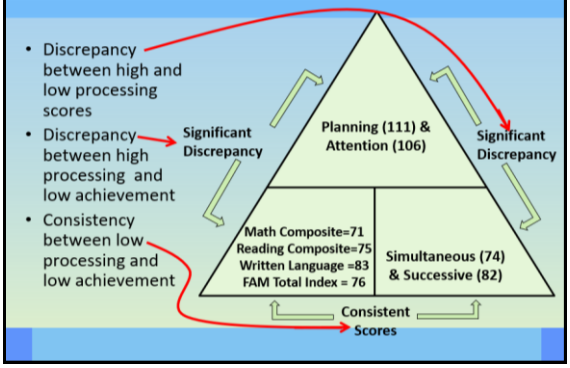
Discrepancy Consistency Method for SLD



PASS and DCM for Eligibility and Intervention

- From a practitioner perspective:
  - DCM provides clarity for SLD eligibility
  - PASS shines light on strengths that would go unnoticed via knowledge-based cognitive assessment
  - Better understanding for using strengths to mitigate weaknesses
  - Simple explanations for parents, teachers *AND* students

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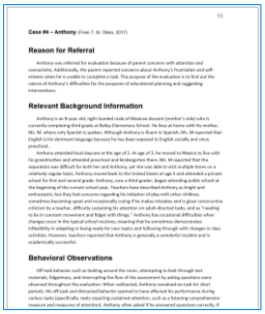
The Case of Anthony

- CORE group activity
- Read the background and test results
- Analyze the pattern of strengths and weaknesses in PASS and academic scores



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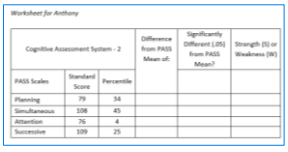
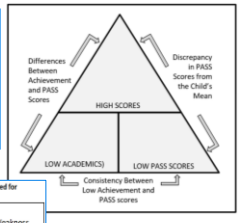
The Case of Anthony – ADHD?



Worksheet for Anthony

Cognitive Assessment System - 2			Difference from PASS Mean of:	Significantly Different (.05) from PASS Mean?	Strength (S) or Weakness (W)
PASS Scales	Standard Score	Percentile			
Planning	79	34			
Simultaneous	108	45			
Attention	76	4			
Successive	109	25			



Differences Between PASS Scale Standard Scores and the Student's Average PASS Score Required for Significance for the CAS2 12-Subtest EXTENDED battery AGES 8-18 Years.

Ages 8-18 YEARS	Cognitive Assessment System - 2	Difference from PASS Mean of:	Significantly Different (at p < .05) from	Strength or Weakness
PASS Scales	Standard Score	93.0		
Planning	79	-14.0	yes	Weakness
Simultaneous	108	15.0	yes	
Attention	76	-17.0	yes	Weakness
Successive	109	16.0	yes	

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The Case of Clark

- CORE group activity
- Read the background and test results
- Analyze the pattern of strengths and weaknesses in PASS and academic scores

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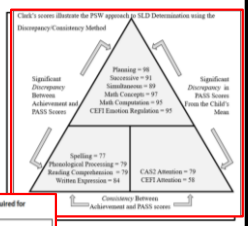
The Case of Clark

Worksheet for Clark

Cognitive Assessment System - 2			Difference from PASS Mean of:	Significantly Different (.05) from PASS Mean?	Strength (S) or Weakness (W)
PASS Scales	Standard Score	Percentile			
Planning	98	45			
Simultaneous	89	24			
Attention	79	8			
Successive	91	27			



Differences Between PASS Scale Standard Scores and the Student's Average PASS Score Required for Significance for the CAS2 12-Subtest EXTENDED battery AGES 8-18 Years.

Ages 8-18 YEARS	Cognitive Assessment System - 2		Difference from PASS Mean of:	Significantly Different (at $p < .05$) from	Strength or Weakness
	PASS Scales	Standard Score	89.3		
	Planning	98	8.8	no	
	Simultaneous	89	-0.3	no	
	Attention	79	-10.3	yes	Weakness
	Successive	91	1.8	no	

CAS2 in New Zealand

➢**Message from** Barbara H

Good morning. I am an educational psychologist in New Zealand. I work with a team of Resource Teachers of learning and behaviour supporting 50 schools in Auckland. We use the CAS2 frequently in conjunction with the WISC-V in assessment where it is felt that a cognitive assessment would be helpful in understanding the cognitive profile of a child so that we can best support them.

- I am working with a Speech Language Therapist and together we have assessed a nine year old boy named Lorence who has a complex (yet to be fully understood) language difficulty.
- I administered the CAS extended battery.
- I have not administered a WISC-V as I doubt it would produce valid information given this child's profile.

CAS2 in New Zealand

- Born in the Philippines.
- Speaks a combination of English and Tagalog
- Attended pre-school and then a city school in the Philippines from the age of 5 years.
- Immigrated to NZ in 2014 when 8 years of age.
- Lorence's language was delayed (did not speak until over 2 years of age).
- At the age of five years he was not pronouncing some words correctly and received private speech language therapy.

CAS2 in New Zealand

- Lorence was referred to the Resource Teachers of Learning and Behaviour Service (RTLB) as he had not been making the expected progress in English and there were ongoing concerns about his difficulties with communication.
  - A Filipino teacher aide employed by the school also had difficulties understanding him in Tagalog.
- School reports Lorence's interactions with others are minimal, he lacks the skills to relate to his peers, he gets frustrated and upset when he does not know what to do.
- He is unable to follow verbal instructions and fixates on rules and what others are doing.

CAS2 in New Zealand

- During the assessments Lorence was not confident in speaking Tagalog, although he does converse in his mother tongue at home.
  - Testing showed that he has forgotten much of his early learning in Tagalog. While he could understand the instructions in Tagalog to talk about the pictures, he answered only in English.
- The assessment team gathered information, did observations and administered a number of assessments
- There is a general belief by the school, speech language therapist and assessment team that this young man is of low cognitive functioning (*I do not agree with this*).

CAS2 in New Zealand

- Test Results
- Peabody Picture Vocabulary Test-4 score = 1st percentile
- Expressive Vocabulary Test score = < 1st percentile

Differences Between PASS Scale Standard Scores and the Student's Average PASS Score Required for Significance at p = .10 and p = .05 for the CAS2 12-Subtest EXTENDED battery.

Cognitive Assessment System-2		PASS Mean & Differences:	Significantly Different (at p = .05) from PASS Mean?	Strength or Weakness
PASS Scales	Standard Score	91.5		
Planning	106	14.5	yes	
Simultaneous	93	1.5	no	
Attention	98	6.5	no	
Successive	69	-22.5	yes	Weakness

CAS2 in New Zealand

- This is a high stakes situation for Lorence and his family.
  - His parents gave up good careers in the Philippines to come to NZ for their children.
  - If Lorence is diagnosed with a disability or unable to make progress in his learning they will not be granted residency and will have to return home.
- I administered the CAS in the hope that it would give me information that would help me to understand more about how best to support this little boy in the classroom.

CAS2 in New Zealand

- Good morning Jack. I just wanted to give you an update on how things are going with the student you helped me with last year.
- The assessment information was shared with the student, his parents and his teachers. This changed the perception others had of him and the perception he had of himself.
- With this new understanding of his strengths and challenges, his teacher last year worked hard to teach him in a way that best suited his learning needs and he has made pleasing progress.
- We have just met with his teacher this year to ensure that she also has an understanding of him so this good work can continue.
- Thank you again for all your help.
- Warmest regards, Barbara H

Presentation Outline

- Introduction
  - Using groups to stimulate thinking
  - How traditional IQ has influenced us
- A new way of thinking about intelligence
  - What is PASS theory of learning
  - How to measure PASS neurocognitive processes
- Final thoughts

Conclusions

- Understanding PASS neurocognitive abilities of the students you work with *will* help you make better decisions about HOW they learn
- Understanding WHY a student fails is the key to knowing HOW they learn best
- The TEST you use has a PROFOUND influence on what you learn about a student – and THAT MAKES ALL THE DIFFERENCE
  - Choose wisely

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