PASS Neurocognitive Theory of Intelligence: Assessment, Eligibility Determination and Intervention using the CAS2

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How Are You Feeling Today ?

2

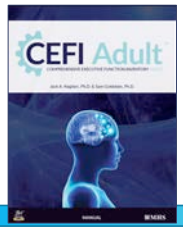
Let's Get Ready to Learn

Mindful Breathing

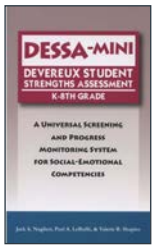
3

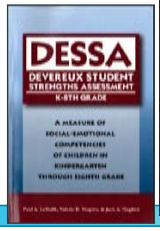
Disclosures

Executive Function



Social Emotional





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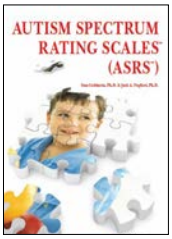
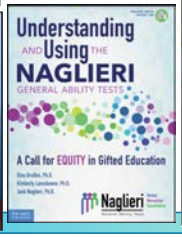
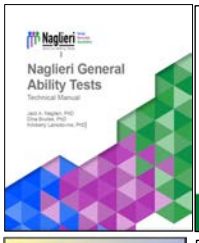
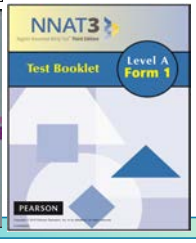


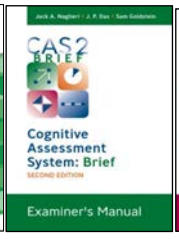


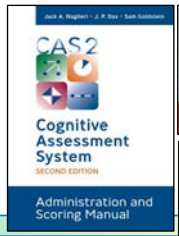
Gifted Identification



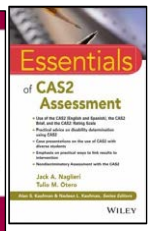


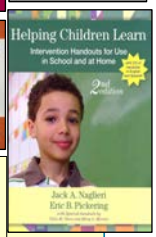
PASS Neurocognitive Theory: Assessment & Intervention Handouts





Coming 2022
CAS2 Online
Admin &
Scoring





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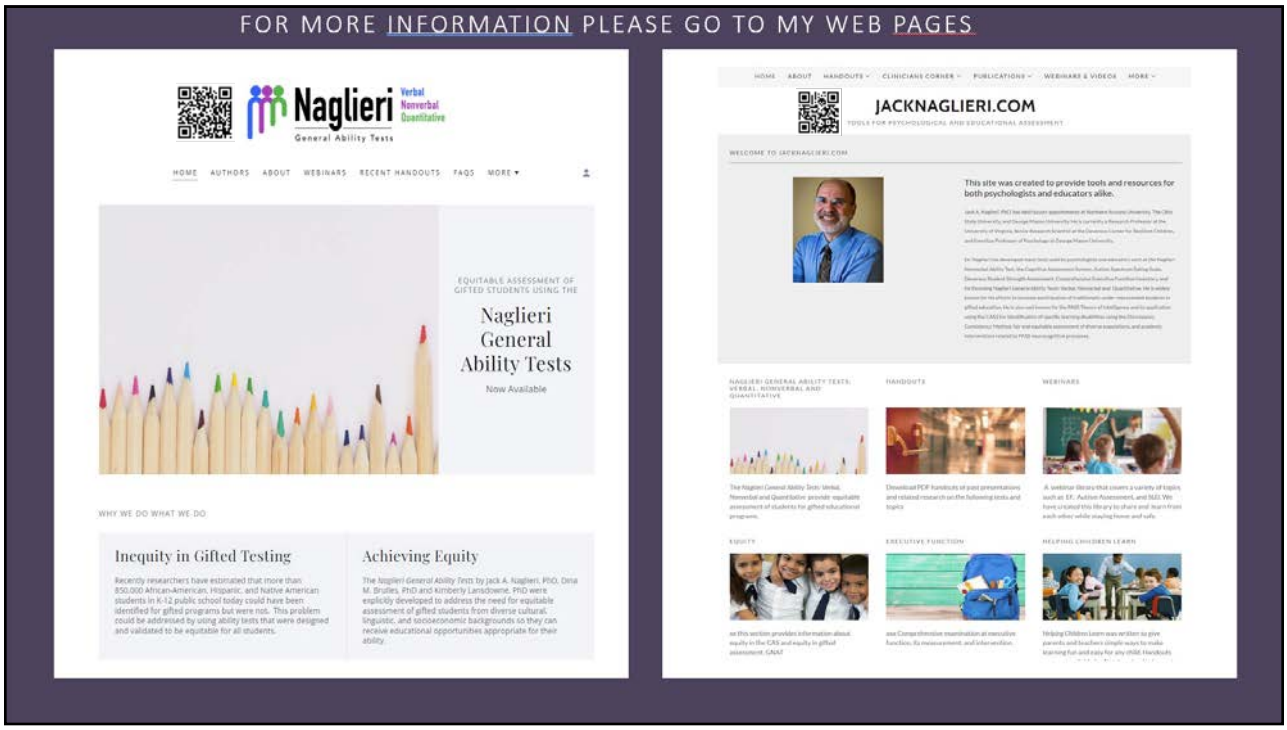

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The BIG picture

- The comprehensive assessments we provide can alter the course of a student's life; making this one of the most important tasks we have.
- We want Intellectual assessment that
  - Is consistent with IDEA and state regulations regarding SLD determination
  - Helps us understand WHY a student fails
  - Informs us about academic strengths & weaknesses and interventions
  - Is fair for students from diverse populations
- These goals can be achieved if we use second-generation tests that measure the way students THINK to LEARN
  - The definition of THINKING should be based on BRAIN function
  - PASS theory is a way of defining THINKING and the Cognitive Assessment System-2nd Edition a way to measure a student's ABILITY to think

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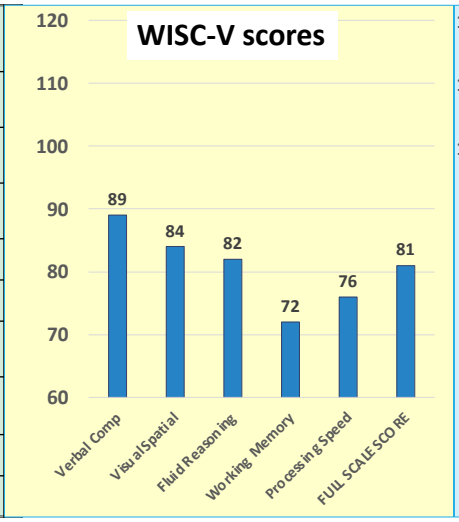
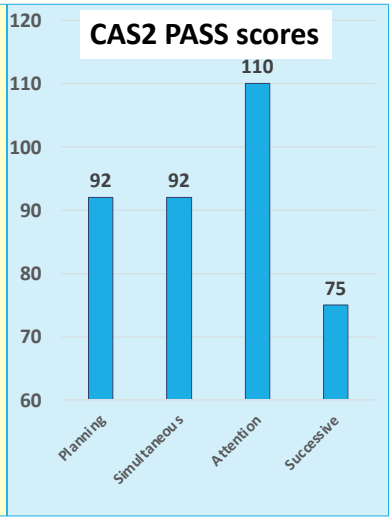
Case of Paul: gr. 4 Dyslexia (Steve Feifer)

- **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

Paul – age 9 Presenting Concerns: Reading, Math Word Problems, Anxiety

WISC-V	STANDARD SCORE
Verbal Comprehension	89
Visual Spatial	84
Fluid Reasoning	82
Working Memory	72
Processing Speed	76
FULL SCALE SCORE	81
WIAT IV Reading	**81**
WIAT IV Math	**90**
WIAT IV Writing	**94**





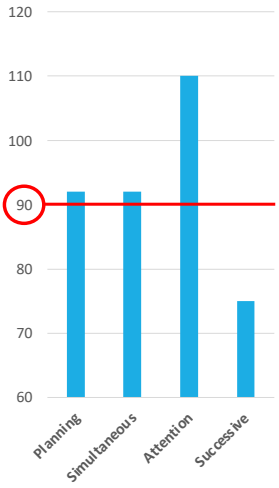
Paul – age 9 years

CAS-2	STANDARD SCORE	Classification
Planning	92	Average
Simultaneous	92	Average
Attention	110	Average
Successive	75	Very Low

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	92.3			
Planning	92	-0.3	no		
Simultaneous	92	-0.3	no		
Attention	110	17.8	yes	Strength	
Successive	75	-17.3	yes		Weakness



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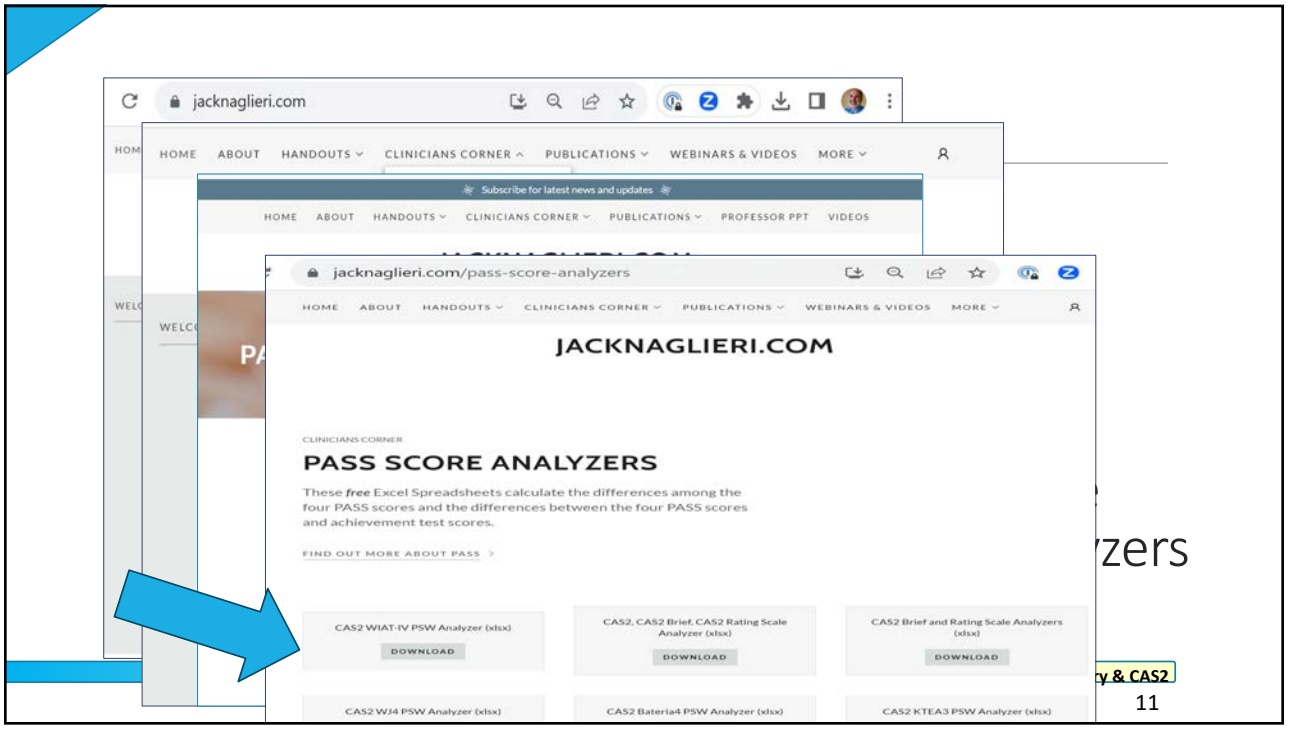

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PASS Score Analyzer for WIAT-IV

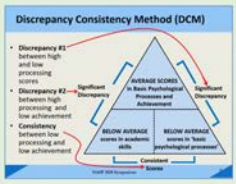
Discrepancy Consistenty Method (DCM) for comparing PASS scores from the *Cognitive Assessment System* (CAS2; Extended & Core battery) with the *WIAT-IV*
Jack A. Naglieri, Ph.D.

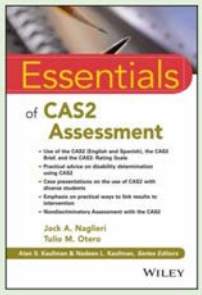
HOW TO USE THIS WORKBOOK:

1. Click on tab for the CAS2 Extended (12-subtests) or Core (8-subtests) with the WIAT-IV Subtests and Composites
2. Enter the PASS scores in the column labeled "Standard Scores" in BOX #1.
3. Enter the achievement test standard scores in BOX #2.

Note: Once the PASS and WIAT-IV scores are entered the discrepancies and consistencies between neurocognitive and achievement scores will be noted. Follow the Flow-Chart (see Figure 3.2 included here) but for a complete discussion of this method and related issues see *Essentials of CAS2 Assessment*).

The information contained in this spreadsheet follows that taken in part from *Essentials of CAS2 Assessment* by Jack A. Naglieri & Tulio M. Otero (2017). See that book for more information on the interpretation of the CAS2 measures of PASS neurocognitive processes. The values needed for significance between the CAS2 with the WIAT-III appear in the *Essentials of CAS2 Assessment* book, as is a discussion of the methodology used and related topics. That discussion similarly applies to the WIAT-IV.





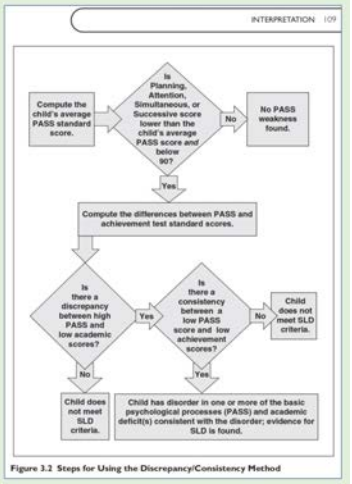
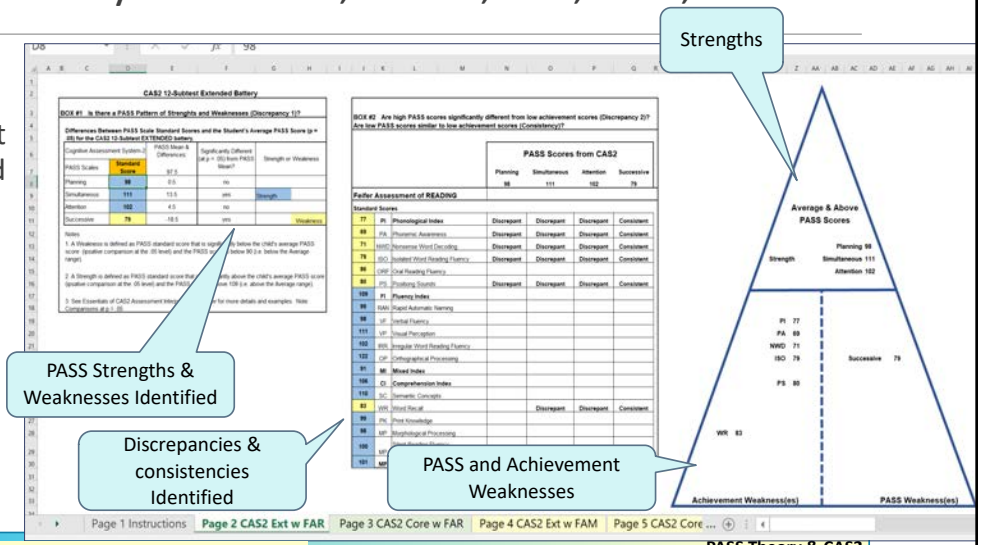


Figure 3.2 Steps for Using the Discrepancy/Consistency Method

Page 1 Instructions | Page 2 CAS2 Ext w Composites | Page 3 CAS2 Core w Composites | Page 4 CAS2 Ext w Subtests | Page 5 CAS2 Core w Subtests | Tech Info

CAS2 PSW Analyzer for WJ4, KTEA3, FAR, FAM, Bateria

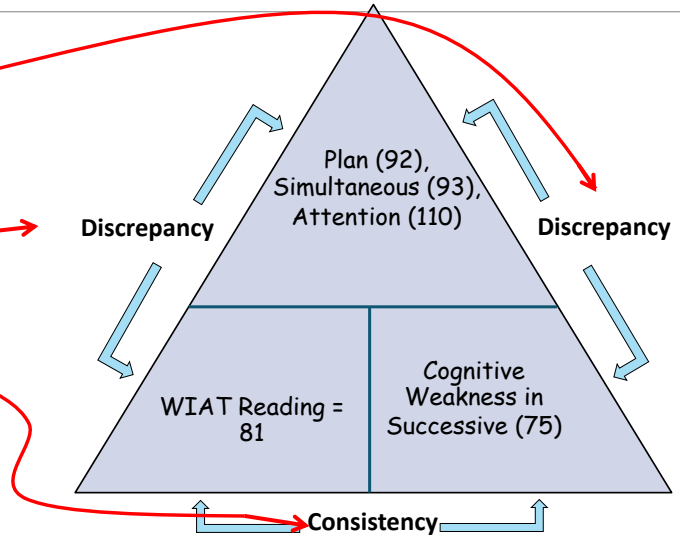
- Enter PASS and Achievement test standard scores and all comparisons are evaluated



FREE – on www.jacknaglieri.com

Paul's Discrepancy Consistency Results

- **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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Intervention Protocol (Naglieri & Kryza, 2019)

1. Help child understand their PASS strengths and challenges (be intentional & transparent)
2. Encourage Motivation & Persistence (student's mindset)
3. Encourage strategy use (build skill sets)
4. Encourage independence and self efficacy (metacognition, self assessment & self correction)

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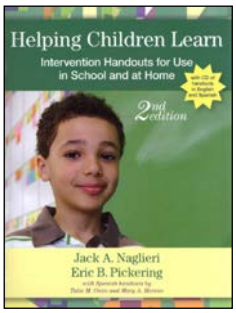
Be Intentional and Transparent

- The test results showed that your brain is strong at
  - Noticing details (Attention),
  - seeing how things go together (Simultaneous)
  - And figuring out how to do things (Planning)
- The results also showed that
  - It is very hard for you to follow a sequence (Successive)
- But we can help you with that…
  - Handouts for students to manage sequences



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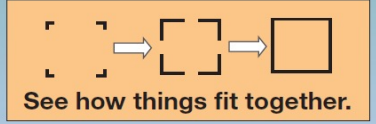
Four Ways to Think Smart!

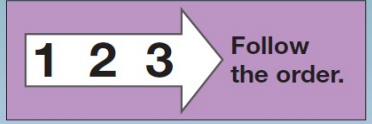
Think smart and use a plan!

Think smart and look at the details!

Think smart and put the pieces together!



Think smart and follow the sequence!



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Step 1 – Talk with Students

How to Be Smart: Planning

When we say people are smart, we usually mean that they know a lot of information. But being smart also means that someone has a lot of ability to learn new things. Being smart at learning new things includes knowing and using your *thinking abilities*. There are ways you can use your abilities *better* when you are learning.

What Does Being Smart Mean?

One ability that is very important is called *Planning*. The ability to *plan* helps you figure out *how to do things*. When you don't know how to solve a problem, using Planning ability will help you figure out how to do it. This ability also helps you control what you think and do. It helps you to stop before doing something you shouldn't do. Planning ability is what helps you wait until the time is right to act. It also helps you make good decisions about what to say and what to do.

CAS2

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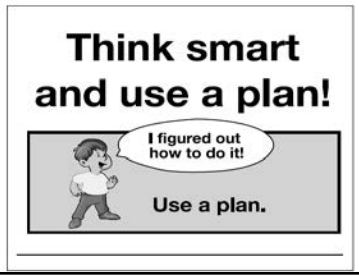
Step 1 – Talk with Students

How Can You Be Smarter?

You can be smarter if you PLAN before doing things. Sometimes people say, "Look before you leap," "Plan your work and work your plan," or "Stop and think." These sayings are about using the ability to plan. When you stop and think about *how* to study, you are using your ability to plan.

You will be able to do more if you remember to use a plan. An easy way to remember to use a plan is to look at the picture "Think smart and use a plan!" (Figure 1). You should always use a plan for reading, vocabulary, spelling, writing, math problem solving, and science.

Do you have a favorite plan for learning spelling words? Do you use flashcards or go on the Internet to learn? Do you ask the teacher or another student for help? You can learn more by using a plan for studying that works best for you.



It is smart to have a plan for doing all schoolwork. When you read, you should have a plan. One plan is to look at the questions you have to answer about the story first. Then read the story to find the answers. Another plan is to make a picture of what you read so that you can see all the parts of the story. When you write you should also have a plan. Students who are good at writing plan and organize their thoughts first. Then they think about what they are doing as they write. Using a plan is a good way to be smarter about your work!

ASS Theory & CAS2

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Step 1 – Talk with Students

How to Be Smart: Attention

When we say people are smart, we usually mean that they know a lot of information. But being smart also means that someone has a lot of ability to learn new things. Being smart at learning new things includes knowing and using your *thinking abilities*. There are ways you can use your abilities *better* when you are learning.

What Does Being Smart Mean?

Attention is a very important ability that everyone has. Everything we do requires the ability to focus on some things and ignore others. The ability to pay attention is what makes us able to focus our thoughts on one thing and resist distractions. No one can learn without the ability to attend. We cannot attend to *all* the information our brain is receiving. In order to focus, we must resist attending to some things so we can focus on others. In school there is much to attend to and many things that are distracting. Students hear others talking, a noise in the hallway, or the beep of a computer; they see a flash of light from the window; and so forth. Schoolwork requires a lot of focus of attention.

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Step 1 – Talk with Students

How Can You Be Smarter?

You can be smarter if you carefully use your ability to attend. Remember to be aware of how well you are attending. Be sure to notice if you are being distracted. If you are having a problem, do something to help you pay attention. You will be able to do more if you remember to "Think smart and look at the details!" (see Figure 1). Remember to think about how well you are attending when you do your work.

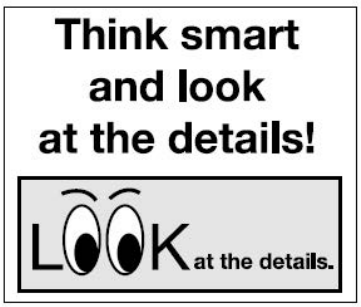

Figure 1. Picture reminder to attend to the details.

It is smart to be aware of your level of attention. Also remember to notice if you are being distracted. Ask yourself, "Am I losing my ability to focus?" or "Am I getting distracted?" If so, change your seat, take a short break, stand up and stretch, or do something to help you attend better. Remember that you can't learn if you can't pay attention.

You should remember that Attention can be disrupted by loud noises or seeing something distracting. It is important to notice when your ability to attend is good or bad. If you are having trouble attending, figure out what you need to do to attend better.

Step 1 – Talk with Students

How to Be Smart: Simultaneous

When we say someone is smart, we usually mean that they know a lot of information. Yet, being smart also means having a lot of ability to learn new things. Being smart at learning new things includes knowing and using *thinking abilities*. There are ways to use your abilities *better* when you are learning.

What Does Being Smart Mean?

Simultaneous ability is what you use to see how things fit together. This ability helps you see the *big* picture. This ability is what helps you understand the meaning of a sentence and a story. It is also very important for seeing patterns in numbers, word spellings, or themes in a story. It also lets you judge distances. For example, when you throw a ball you have to judge the distance to your target and how high you have to aim to get it there.

How Can You Be Smarter?

You can be smarter if you look to see how things are connected. Sometimes people say, "Get the big picture." This saying is about using your Simultaneous ability. When you stop and think about *how things fit together to make the "big picture,"* you are using your Simultaneous ability.

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Step 1 – Talk with Students

You will be able to learn more if you remember to see patterns and themes in all you do. An easy way to remember to do this is to look at the picture "Think smart and put the pieces together!" (Figure 1). You should always use your ability to see how parts go together to make a whole when reading; studying vocabulary, spelling, or science; and solving math problems.

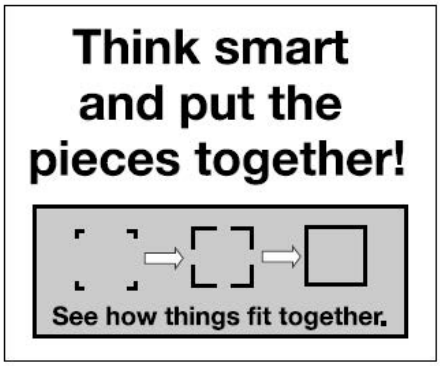

Figure 1. Picture for remembering to see the big picture.

It is smart to use your ability to see the big picture when doing all schoolwork. When you read, you should draw a picture of the characters and story line. Use a series of drawings that shows what happens in the story. Creating a story by using pictures is an excellent way to organize the information. Simultaneous ability is used when you do that, and it is a good way to be smarter about your work!

You can improve your math skills if you use Simultaneous ability. Think about the problem, see what information is needed and what is not, figure out what is related to what, and use esti-

CAS2

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Step 1 – Talk with Students

How to Be Smart: Successive

When we say people are smart, we usually mean they know a lot of information. But being smart also means that someone has a lot of ability to learn new things. Being smart at learning new things includes knowing and using your *thinking abilities*. There are ways you can use your abilities *better* when you are learning.

What Does Being Smart Mean?

Successive ability is what you use to put *information in order.* It is what you use when you have to remember the *sequence* of information, such as a telephone number. When you tie your shoe you have to do all the steps in the right *order*. When you are sounding out a word you haven't seen before, you are using your Successive ability to say the sounds in the correct *order*. When you repeat a word you have never heard before, especially if it is in a different language, you are using Successive ability. This ability also helps you put sounds together to say words, and words together to make sentences. Sequential ability is very important for reading, math, and all of your subjects.

CAS2

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Step 1 – Talk with Students

How Can You Be Smarter?

You can be smarter if you pay attention to the sequences in which things must be done. There are ways of making the sequence easier to remember. For example, group letters when spelling words. Find out if writing the words 10 times each helps you. Do flashcards work better for you? It is smart to find out how you learn sequences best and then to use what works best for you. Thinking about the sequences of things is a good way to be smarter about your work!

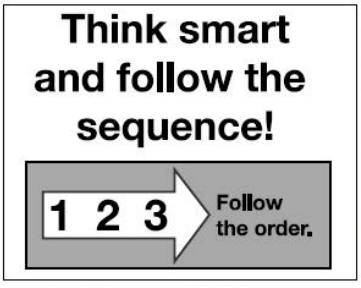

Figure 1. Picture for remembering to follow the sequence.

Remembering to Follow the Sequence

Remember that sometimes when you are anxious, tired, or just doing too many things at one time, you might forget to look at the order in which information is presented. When you see that you are not using your Successive ability, say to yourself, "Think smart and follow the sequence!" (see Figure 1). Looking closely at the sequences of things will make you smarter!

PASS Theory & CAS2

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Ideas to Consider

A Theory Based on Brain Function	• Thinking vs Knowing
From PASS to CAS2	• A Different View of People
Research Update	• PASS and Equity – Measure Thinking not Knowing • To *g* or not to *g*
Administration and Interpretation Issues	• Test order, subtest interpretation, etc.
Reasons To Change	• Validity of PASS Theory

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Shift from Traditional To Second Generation Intelligence Tests

- Wechsler, et al
- **C**ognitive **A**ssessment **S**ystem 2nd Edition

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Intelligence as Neurocognitive Functions

- In my first working meeting with JP Das (February 11, 1984) we proposed that intelligence was better REinvented as neurocognitive processes andwe began development of the **C**ognitive **A**ssessment **S**ystem (Naglieri & Das, 1997).
- We conceptualized intelligence as Planning, Attention, Simultaneous, and Successive (PASS) neurocognitive processes based on Luria's concepts of brain function.

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Key Attributes of a Second-Generation Intelligence Test

1. We started with a THEORY of intelligence based on the BRAIN as described by A. R. Luria
2. We selected and created test questions to measure THINKING defined as PASS
3. We did not include test questions that demand KNOWING such as Vocabulary, etc.
4. There is now considerable research to demonstrate that PASS scores from the CAS are equitable, interpretable beyond the total score, yields profiles for strengths and weaknesses, and leads to intervention

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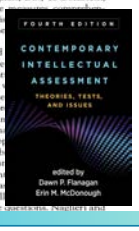
Neuropsychological Correlates of PASS

Naglieri, J. A., & Otero, T. M. Redefining Intelligence as the PASS Theory of Neurocognitive Processes.

CHAPTER 6

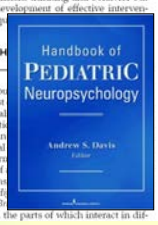
Redefining Intelligence with the Planning, Attention, Simultaneous, and Successive Theory of Neurocognitive Processes



28 Cognitive Assessment System: Redefining Intelligence From a Neuropsychological Perspective

Jack A. Naglieri and Tulio M. Otero

INTRODUCTION



PASS Theory & CAS2

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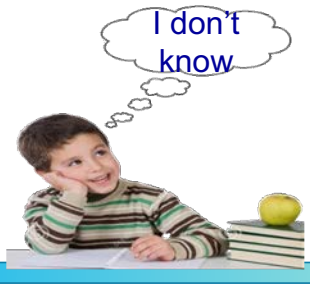
CAS2 Measures Thinking (PASS) not Knowing

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



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

This is dependent on the brain's neurocognitive processes

PASS Theory & CAS2

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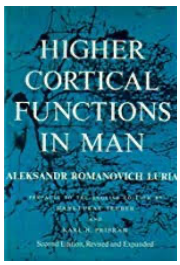
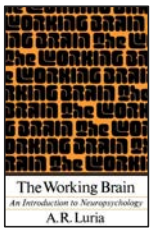
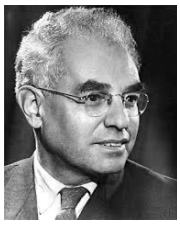
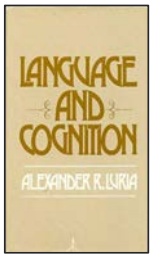
PASS Neurocognitive Theory









- **P**lanning = THINKING ABOUT HOW YOU DO WHAT YOU DECIDE TO DO
- **A**ttention = Focused THINKING and RESISTANCE TO DISTRACTIONS
- **S**imultaneous = THINKING about how things go together
- **S**uccessive = THINKING about A SEQUENCE

PASS = 'basic psychological processes'

NOTE: Easy to understand concepts!

PASS Provides a Common Language

- Psychologists, teachers, parents, and students can all use a common language to describe abilities without the esoteric terms we have used for years – NO psychobabble

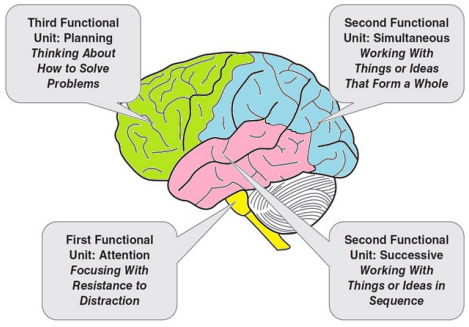


Figure 1.2 Three Functional Units and Associated Brain Structures

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

Frankie was struggling in school at age 11

None of the images of students are real pictures of the person

- Referred by parents 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

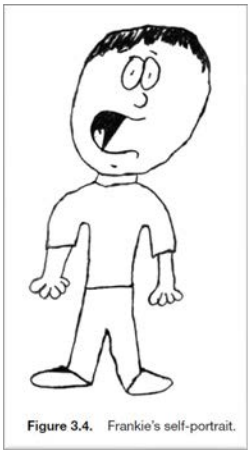


Figure 3.4. Frankie's self-portrait.

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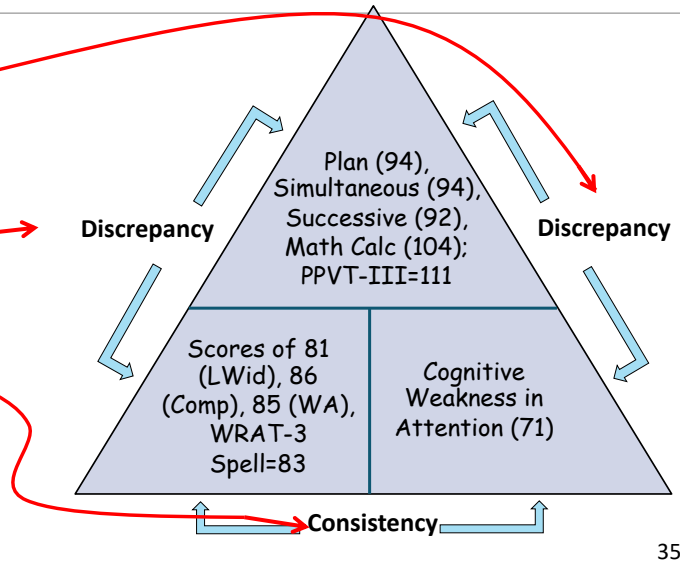
Frankie's Discrepancy Consistency Results

- **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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Frankie: Then and Now

- I informed Frankie of his PASS scores, and everything changed
- He learned to manage his attention problem by using good Planning which helped him
  - recognize when he is off task
  - Think of possible ways to manage his attention
  - recognize when he needed a change in the environment to reduce distractions
- Perhaps most importantly: He was given hope – that he could succeed

- Is married and has a Frankie graduated High School and went to college
- few children
- He is a graphic designer
- He uses his knowledge and good Planning, Simultaneous and Successive processing to manage any obstacles he may still have with attention

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PASS Theory Based on Brain Function – Planning

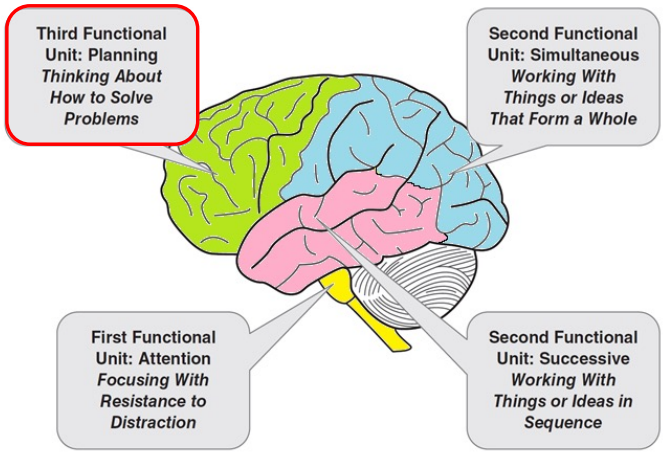

Figure 1.2 Three Functional Units and Associated Brain Structures

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

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PASS Theory: Planning

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

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

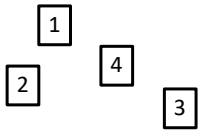
___ + ___ + ___ + ___ + ___ = ___

Planning Raw Score

Planning Subtests

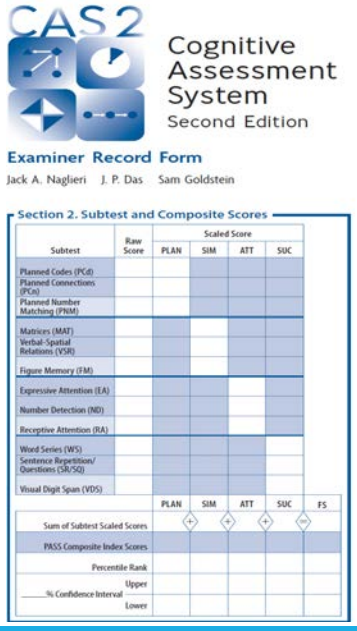
Planned Codes

Planned Connections



Planned Number Matching

5176	5761	5167	1576	5176	1567



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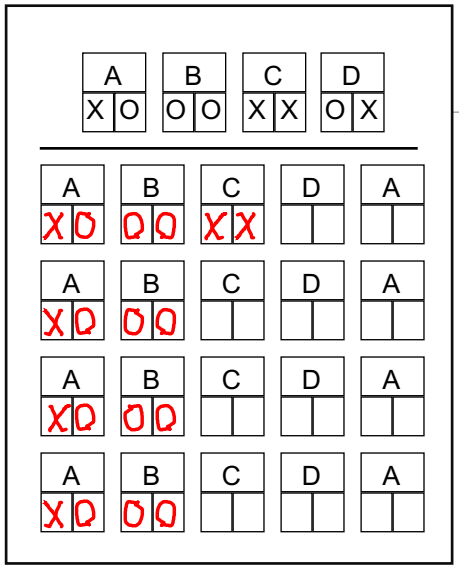

Planned Codes Page 1

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

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Planned Codes Page 2 Jack Jr age 10

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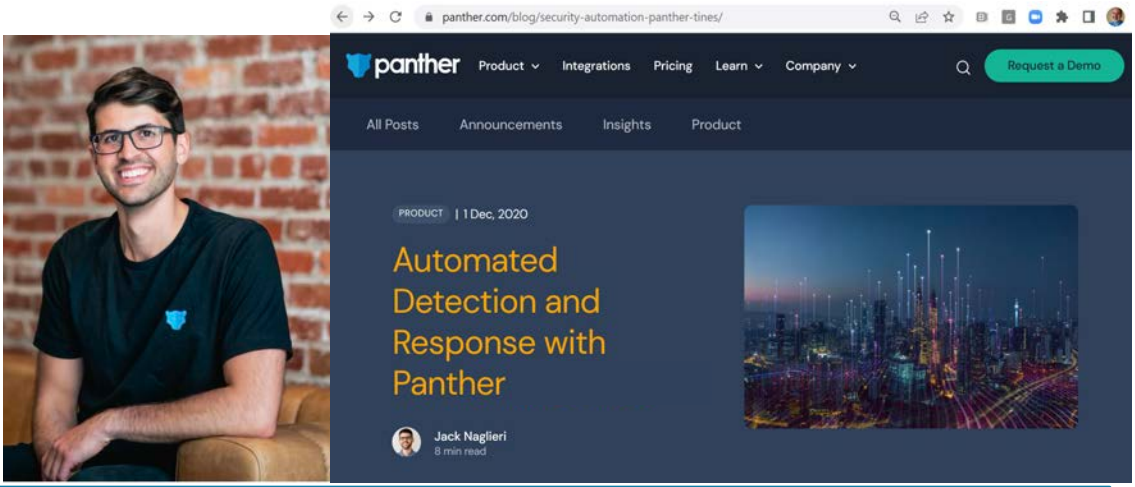
20 Years Later Planning is the Key to Success



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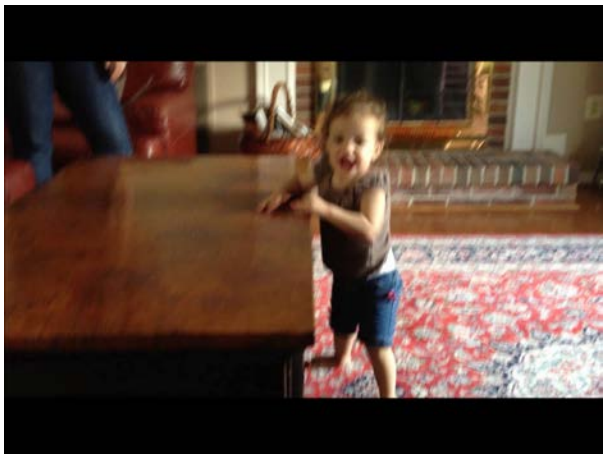
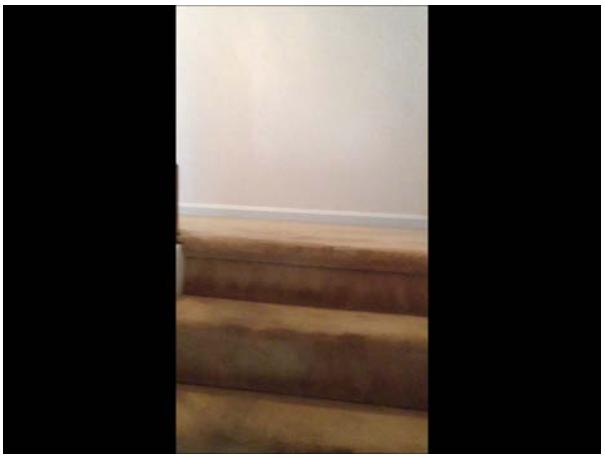
A 13 month old's Plan

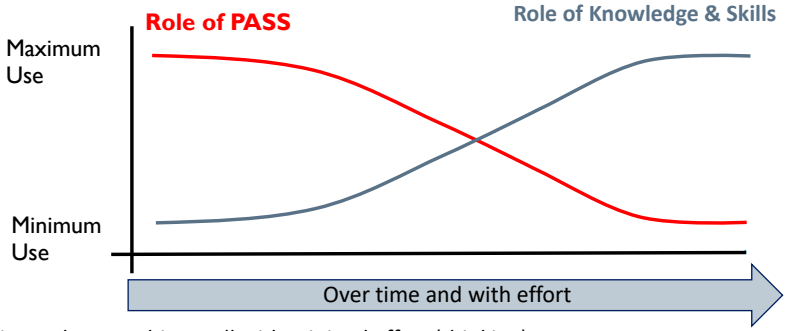
At 19 months Planning & Knowledge





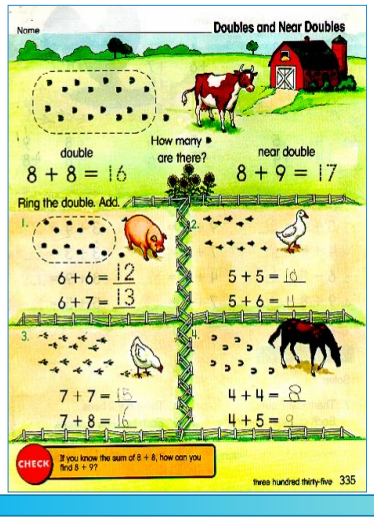
Planning Learning Curves

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



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

Math strategies stimulate thinking



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

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

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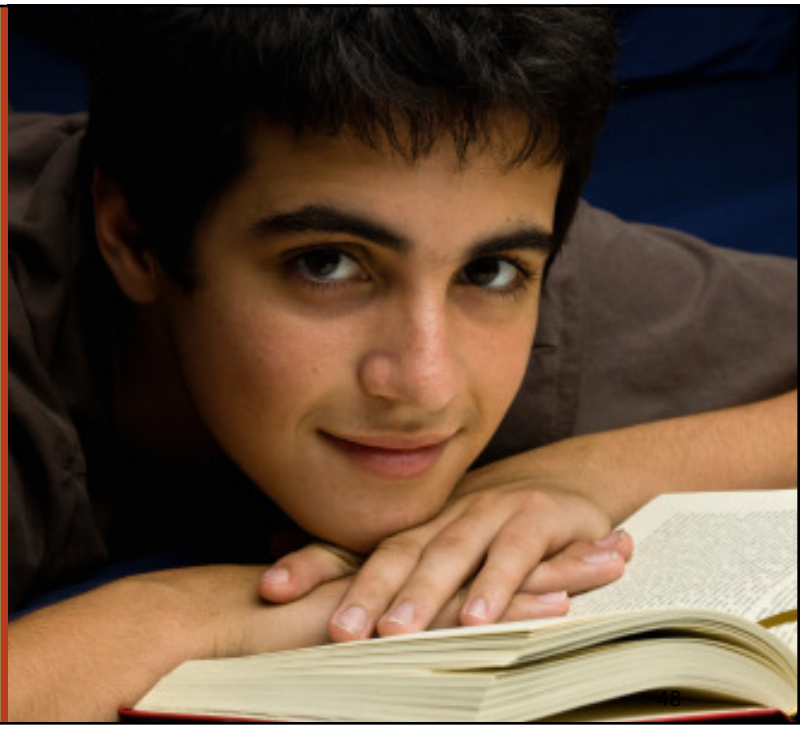
The Case of Rocky

Strengths with Specific Learning Disability and

ADHD



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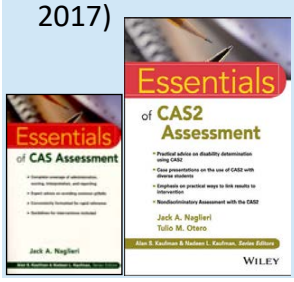
The case of Rocky

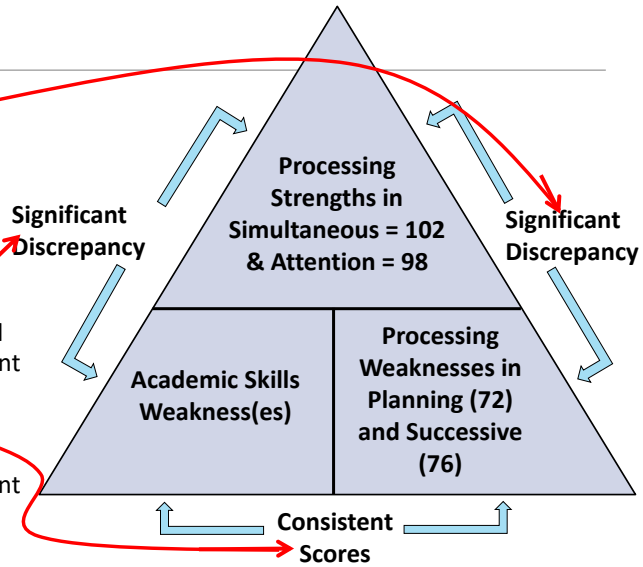
- Rocky[1] went to school in a large middle-class district
- In first grade Rocky was significantly below grade benchmarks in reading, math, and writing.
  - He received group reading instruction weekly and six months of individual reading instruction but minimal progress →retained
- By the middle of his second year in first grade he still struggling
  - decoding, phonics, and sight word vocabulary; math problems, addition, 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 in reading, writing, and math

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

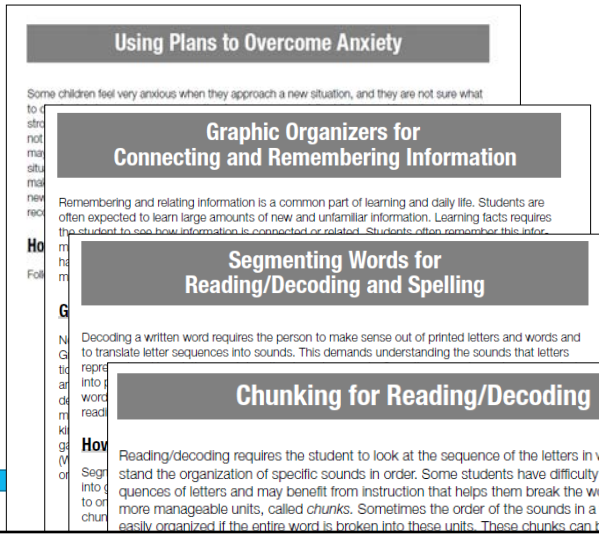
- The Discrepancy Consistency Method (DCM) was first introduced in 1999 (most recently in 2017)



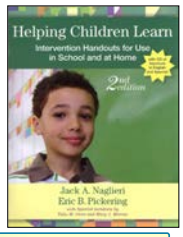
- Discrepancy between high and low processing scores
- Discrepancy between high processing and low achievement
- Consistency between low processing and low achievement



Interventions for Rocky



- Helping Children Learn Intervention Handouts for Use in School and at Home, *Second Edition*
  By Jack A. Naglieri, Ph.D., & Eric B. Pickering, Ph.D.,
- Spanish handouts by
- Tulio Otero, Ph.D., &
- Mary Moreno, Ph.D.



PASS Theory & CAS2

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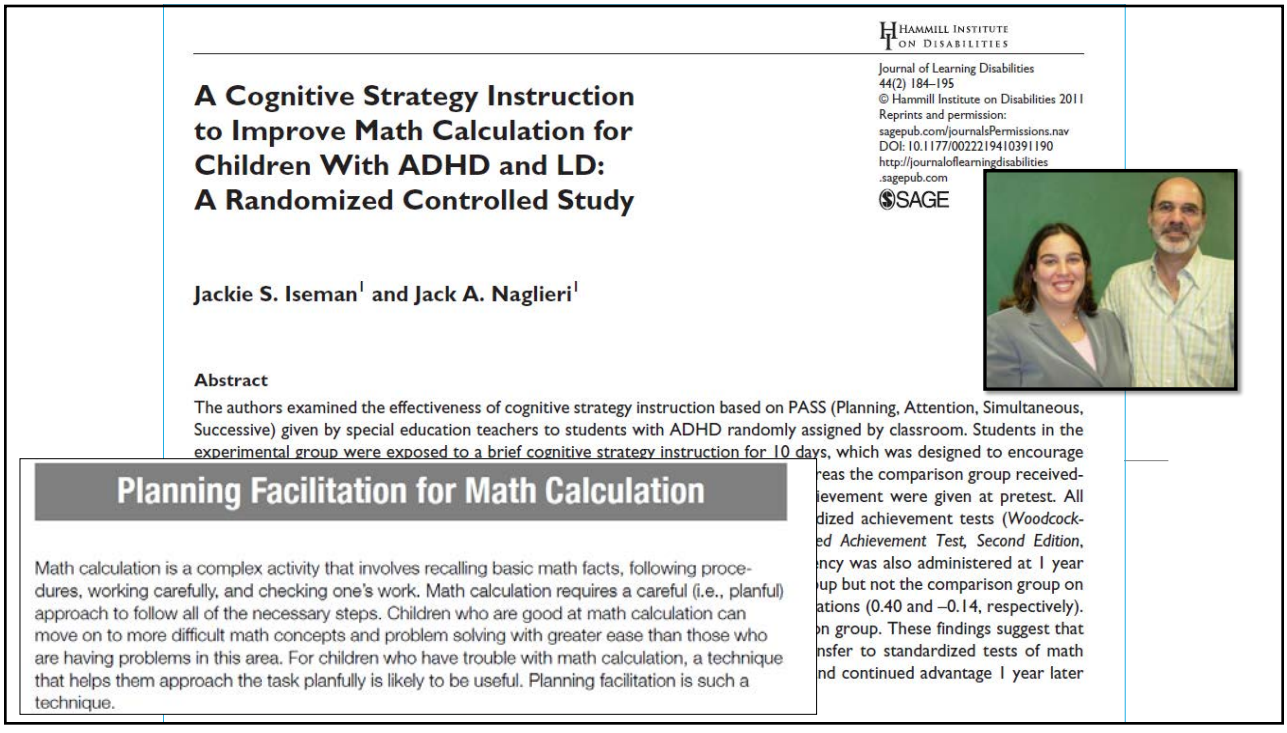

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Instructional Sessions

- Math lessons were organized into "instructional sessions" delivered over 13 consecutive days
- Each instructional session was 30-40 minutes
- Each instructional session was comprised of three segments as shown below

10 minutes	10-20 minutes	10 minutes
10 minute math worksheet	Planning Facilitation or Normal Instruction	10 minute math worksheet

Experimental Group
19 worksheets with Planning Facilitation

Vs.

Control Group
19 worksheets with Normal Instruction

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Planning (Metacognitive) Strategy Instruction

Teachers Asked

- Teachers *facilitated* discussions to help students become more self-reflective about use of strategies
- Teachers asked questions like:
  - What was your goal?
  - Where did you start the worksheet?
  - What strategies did you use?
  - How did the strategy help you reach your goal?
  - What will you do again next time?

Students Responded

- "My goal was to do all of the easy problems on every page first, then do the others."
- "I do the problems I know, then I check my work."
- "I draw lines to keep the columns straight"
- "I did the ones that took the least time"

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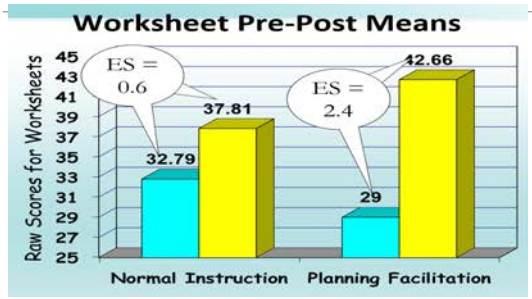
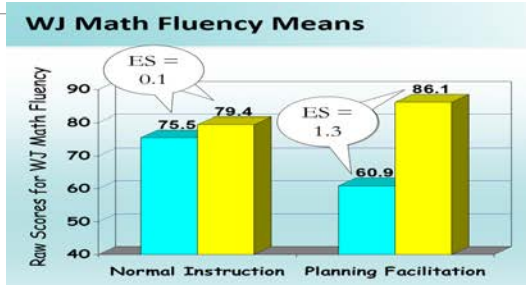
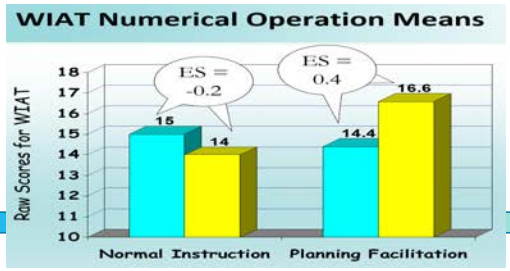
Pre-Post Means and Effect Sizes for the Students with LD and ADHD



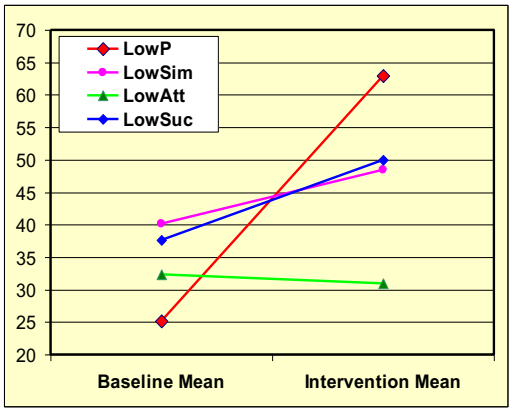




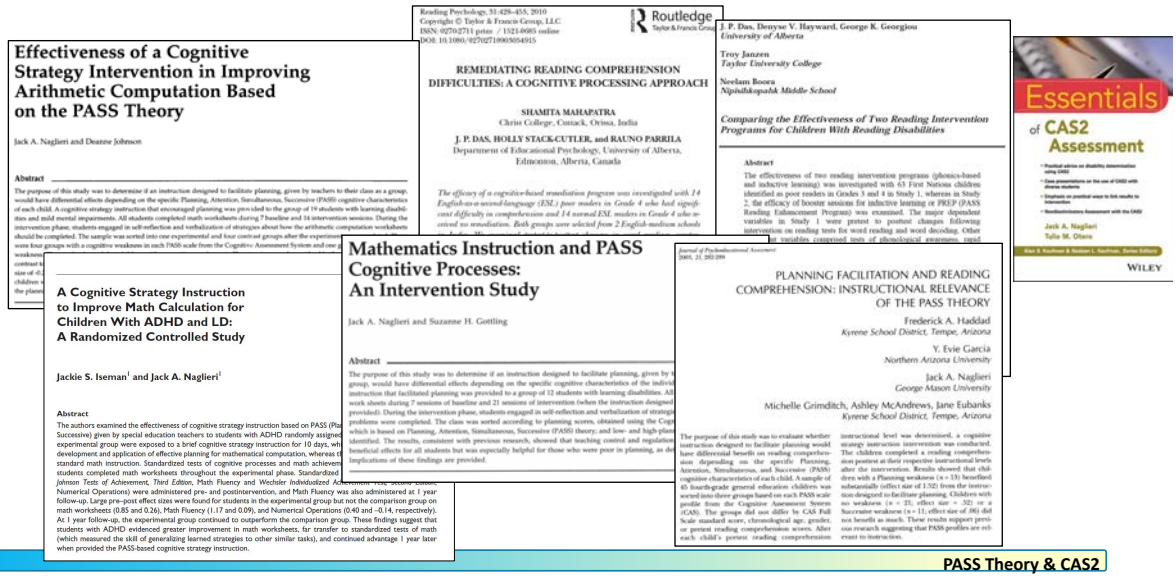
At 1-year follow-up, 27 of the students were retested on the WJ-III ACH Math Fluency subtest as part of the school's typical yearly evaluation of students. This group included 14 students from the comparison group and 13 students from the experimental group. The results indicated that the improvement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

Pre-Post Changes for the Students with LD and ADHD

- The students with a weakness in Planning, Simultaneous or Successive processing scales benefited from the Planning Facilitation method
- Importantly, the students with a weakness in Planning improved the most
- This has been the case in all the studies of Planning Facilitation
- COGNITION PREDICTS RESPONSE TO INTERVENTION



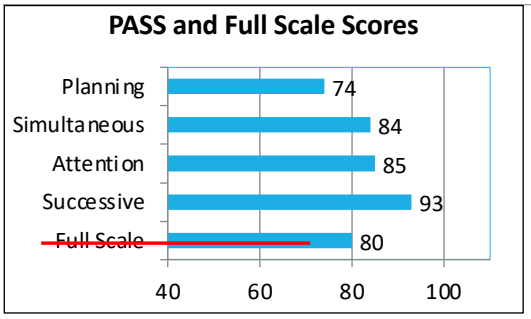
Summary of PASS Intervention Research in Essentials of CAS2



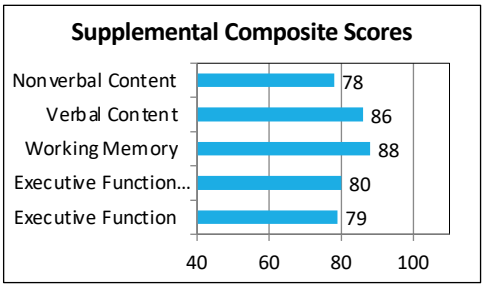
Jessica

- Previous diagnoses of ADHD, ODD, Anxiety and Depression.
- Received OT since 1st grade.
- Since 3rd grade the OT focus was helping the teacher to teach strategies for self monitoring, attention, visual sequencing, and organization
- Problems following verbal directions, inefficient work, struggles to work in a noisy setting, is distractable, fiddles with objects, inflexible, and frustrates easily.
- She receives speech and language services for language processing issues.
- Currently takes medications to manage her diagnoses, she takes Clonidine 0.2 mg to help with sleep and anger issues. She also takes Ritalin 40 mg ER in the am and 10 mg booster at lunch time.

Jessica 4th grade



Composite/Subtest	Standard Scores	Percentile Rank	Descriptive Category
Reading Composite	74	4	Below average
Letter & Word Recognition	73	4	Below average
Reading Comprehension	76	5	Below average
Math Composite	68	2	Low
Math Concepts & Applications	65	1	Low
Math Computation	74	4	Below average
Written Language Composite	-	-	-
Spelling	66	1	Low



PASS Theory & CAS2

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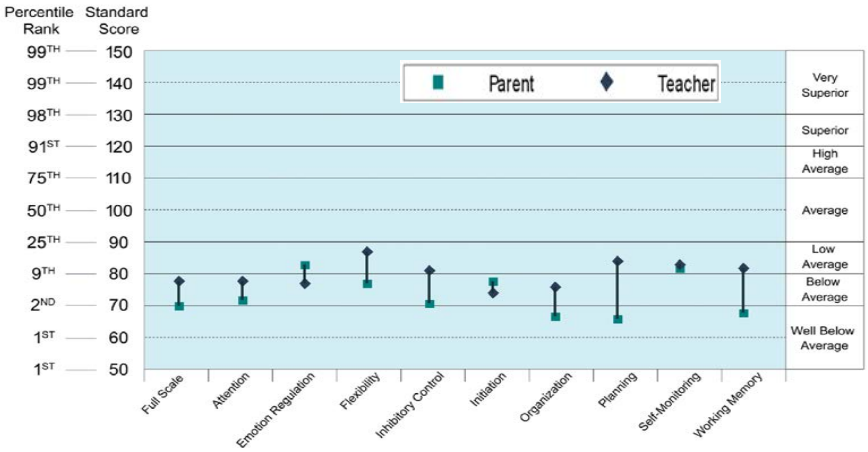
Comprehensive Executive Function Inventory- CEFI



PASS Theory & CAS2

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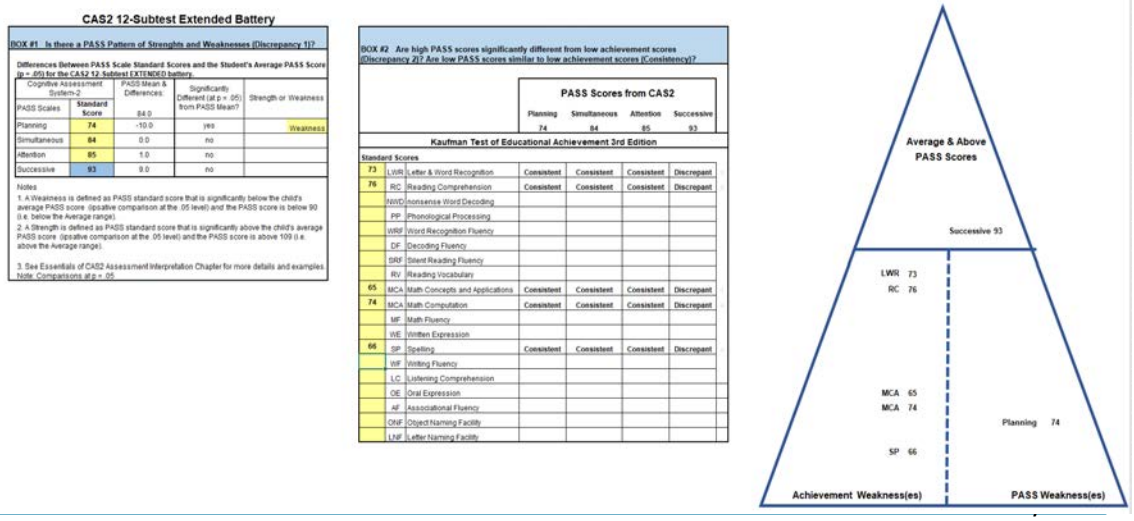
FREE PASS and KTEA-III Score Analyzer



CAS2 12-Subtest Extended Battery

BOX #1 Is there a PASS Pattern of Strengths and Weaknesses (Discrepancy 1)?

Differences Between PASS Scale Standard Scores and the Student's Average PASS Score (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	84.0		
Planning	74	-10.0	yes	Weakness
Simultaneous	84	0.0	no	
Attention	85	1.0	no	
Successive	93	9.0	no	

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).
3. See Essentials of CAS2 Assessment Interpretation Chapter for more details and examples.
Note: Comparisons at p = .05

BOX #2 Are high PASS scores significantly different from low achievement scores (Discrepancy 2)? Are low PASS scores similar to low achievement scores (Consistency)?

			PASS Scores from CAS2			
			Planning	Simultaneous	Attention	Successive
			74	84	85	93
Kaufman Test of Educational Achievement 3rd Edition						
Standard Scores						
73	LWR	Letter & Word Recognition	Consistent	Consistent	Consistent	Discrepant
76	RC	Reading Comprehension	Consistent	Consistent	Consistent	Discrepant
	NWD	Nonsense Word Decoding				
	PP	Phonological Processing				
	WRF	Word Recognition Fluency				
	DF	Decoding Fluency				
	SRF	Silent Reading Fluency				
	RV	Reading Vocabulary				
65	MCA	Math Concepts and Applications	Consistent	Consistent	Consistent	Discrepant
74	MCA	Math Computation	Consistent	Consistent	Consistent	Discrepant
	MF	Math Fluency				
	WE	Written Expression				
66	SP	Spelling	Consistent	Consistent	Consistent	Discrepant
	WF	Writing Fluency				
	LC	Listening Comprehension				
	OE	Oral Expression				
	AF	Associational Fluency				
	ONF	Object Naming Facility				
	LNF	Letter Naming Facility				

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Impressions

- This case is an example of the behaviors (CEFI) that are consistent with a low planning score on CAS2.
- Based on the data and teacher reports/observations, I see her low performance is driven by Low planning, EF, and Attention. She can't get to the point where she can fully recruit Simultaneous and Successive processes.

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Core Group Activity

- **QUESTIONS:**
- **We have looked at a few case studies, what is you impression of this approach to assessment?**
- **What are the possible advantages?**

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PASS Theory Based on Brain Function -– Attention

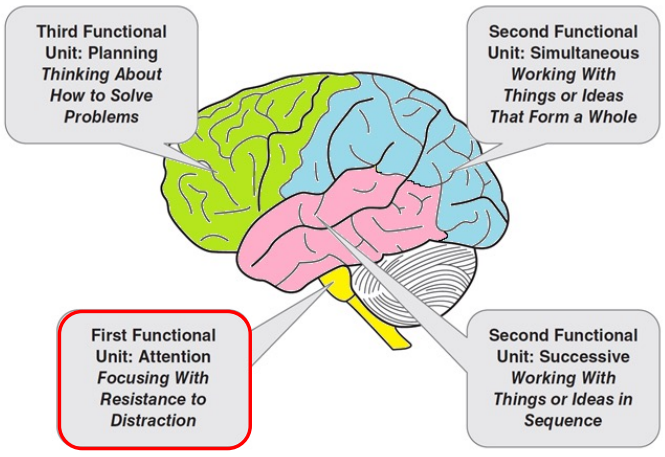

Figure 1.2 Three Functional Units and Associated Brain Structures

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

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Attention Subtests

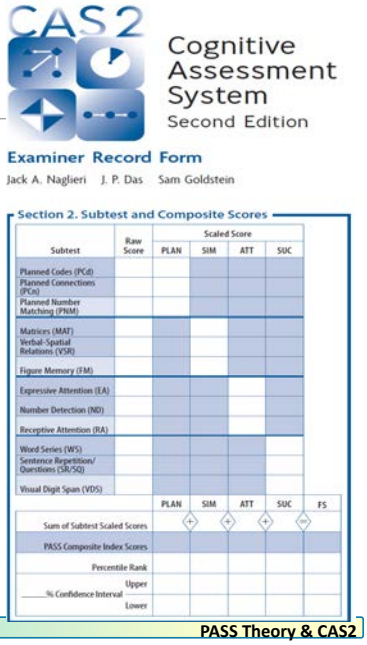
Expressive Attention

Number Detection

Find the numbers that look like this: 1 2
1 5 1 4 2 2 5

Receptive Attention

N n	T r	b t
T R	n b	A a



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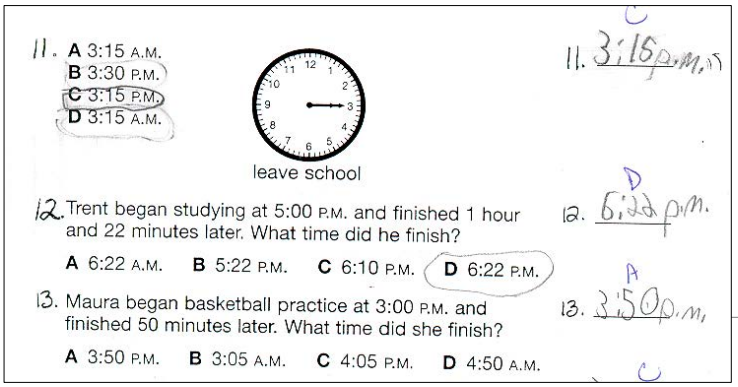
PASS Theory: Attention

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

RED	RED	BLUE
YELLOW	YELLOW	RED
BLUE	RED	YELLOW
BLUE	BLUE	BLUE
YELLOW	BLUE	YELLOW

66


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

leave school

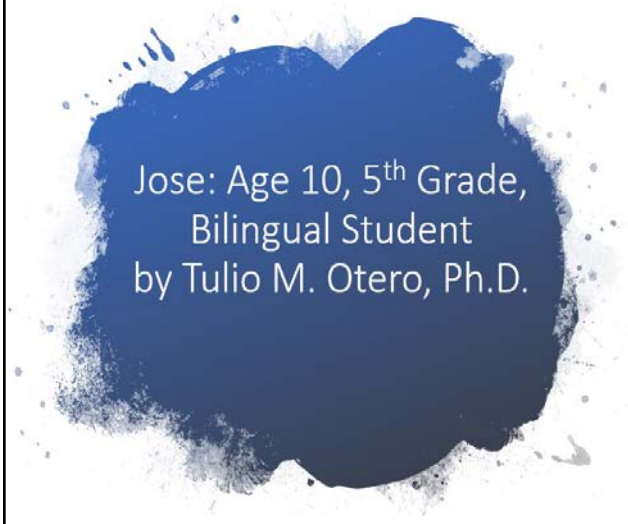
12. Trent began studying at 5:00 P.M. and finished 1 hour and 22 minutes later. What time did he finish?
A 6:22 A.M. B 5:22 P.M. C 6:10 P.M. D 6:22 P.M.

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.

11. 3:15 p.m.
12. 6:22 p.m.
13. 3:50 p.m.

Attention

READING COMPREHENSION IS DIFFICULT BECAUSE OF THE SIMILARITY OF THE OPTIONS



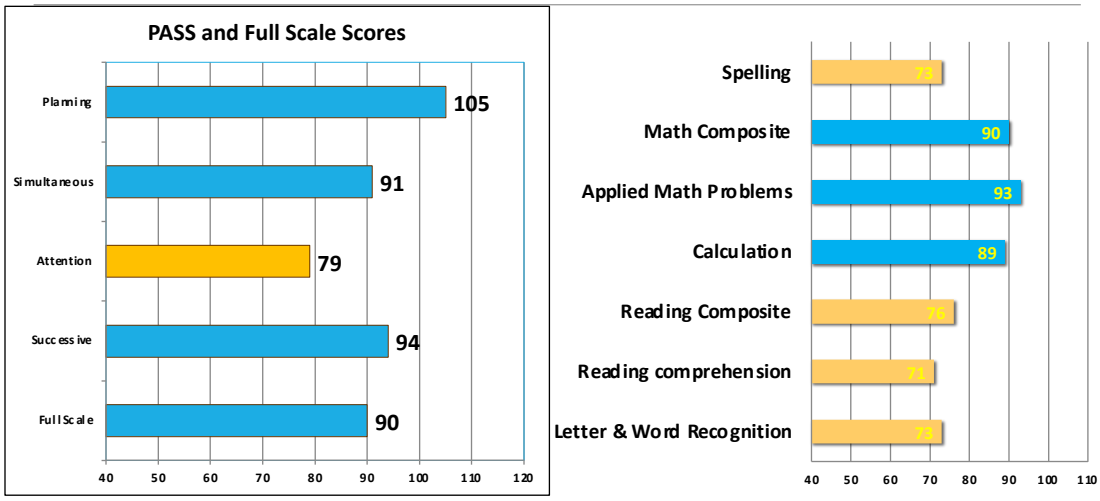
Jose reading problems and the teacher these concerns:

phonemic awareness, reading fluency, reading comprehension math problem-solving, spelling, written expression

Jose also receives ELL services and his current ACCESS scores are as follows: Listening 5.8, Speaking 1.9, Reading 2.8, Writing 3.5.

2018 WISC4 Spanish : VCI 55, PRI 92, WM 86, PS 91

CAS2 and KTEA-III Scores (January 2020)



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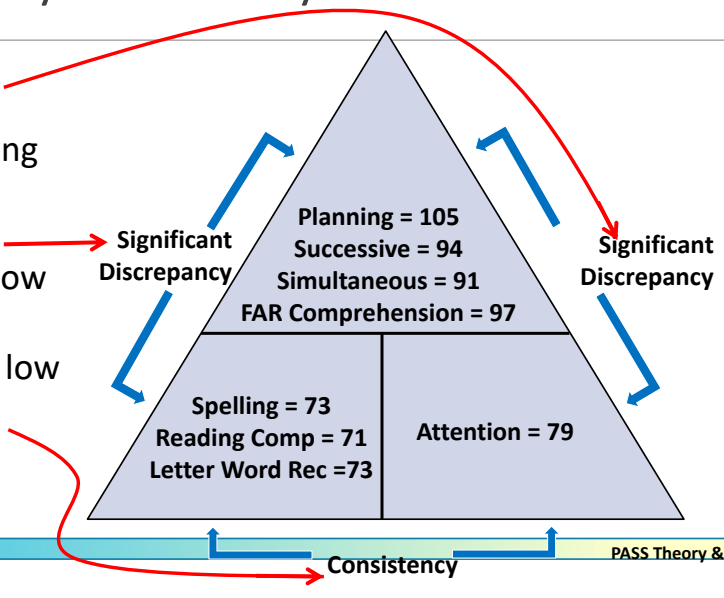
Discrepancy Consistency Method for Jose

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



70

Intervention Protocol (Naglieri & Kryza, 2019)

1. Help child understand their PASS strengths and challenges (be intentional & transparent)
2. Encourage Motivation & Persistence (student's mindset)
3. Encourage strategy use (build skill sets)
4. Encourage independence and self efficacy (metacognition, self assessment & self correction)

Jose was given this simple intervention

Remember to check how well you are attending. If you are having a problem, use a plan and look at this
(taped to his desk).

From: Naglieri, J. A., & Pickering, E. B. (2010). *Helping Children Learn: Intervention Handouts for Use at School and Home (Second Edition).* Baltimore, MD: Brookes Publishing.

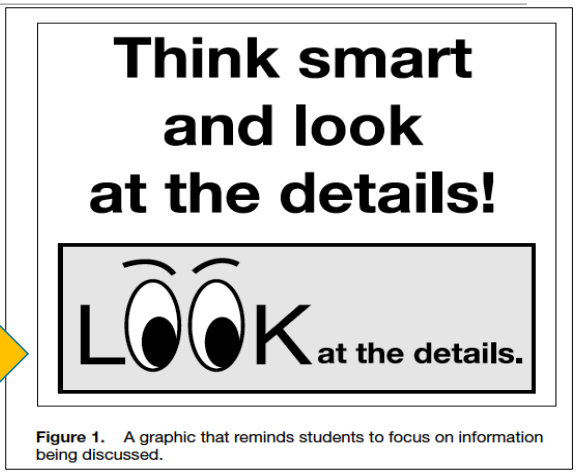


Figure 1. A graphic that reminds students to focus on information being discussed.

Two weeks later!

- Teacher reported that José has increased his reading accuracy by at least 80%.
- He read 16 words correctly out of a list of 20.
- He has done this over the last 3. sessions.

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PASS Theory Based on Brain Function - Simultaneous Processing

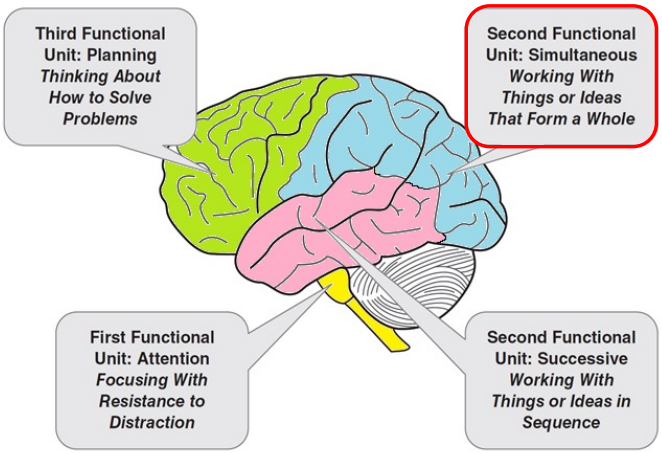

Figure 1.2 Three Functional Units and Associated Brain Structures

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

74

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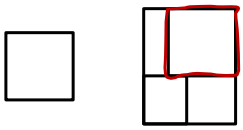
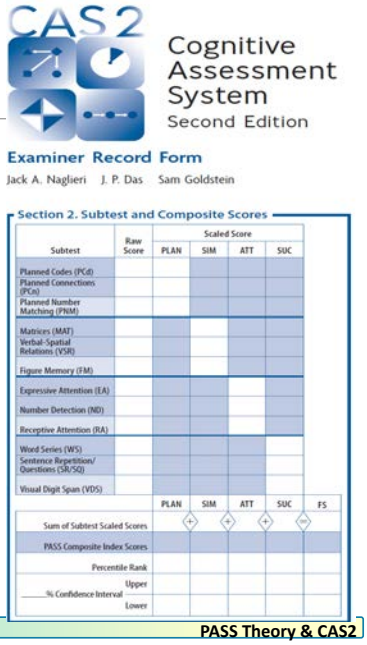
Simultaneous Subtests

Matrices

Verbal Spatial Relations

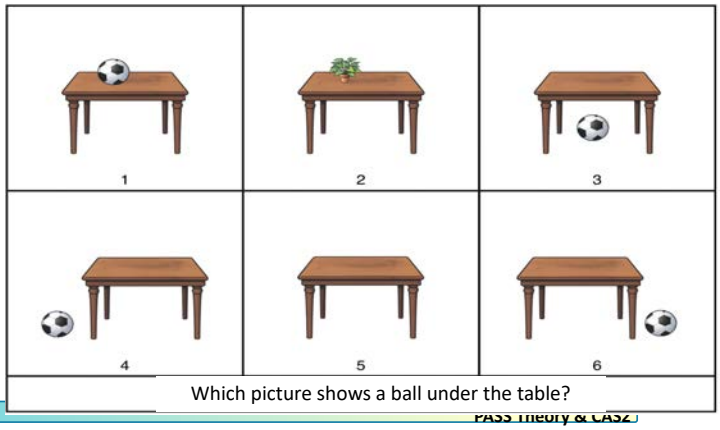
Figure Memory

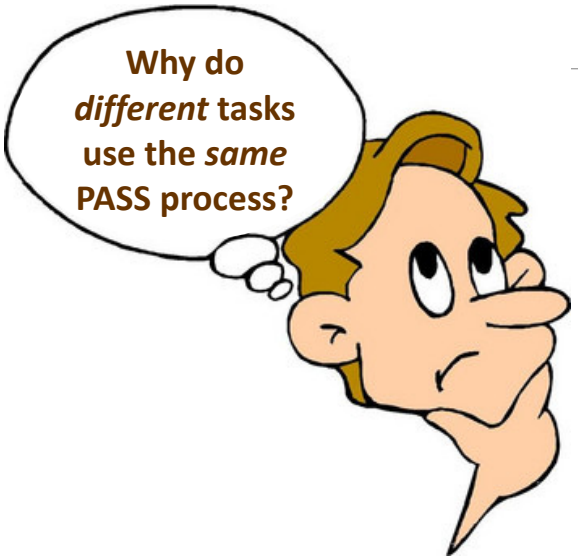




PASS Theory: Simultaneous

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



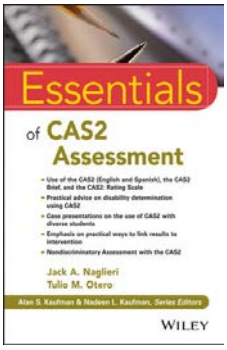


And Consider this…

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

Case: Neil (Naglieri & Feifer, 2017, Intervention Chapter 5)

- Neil (9 year-old 4th grader)
  - 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.



Case: Neil 4th grade –CAS2

CAS-2	STANDARD SCORE	RANGE
Planning:	**94**	**Average**
Attention:	**98**	**Average**
Simultaneous the ability to reason and problem solve by integrating separate elements into a conceptual whole, and often requires strong visual-spatial problem solving skills.	**74**	**Very Low**
Successive	**90**	**Average**
~~**CAS-2 Full SCale**~~	~~**89**~~	~~**Below Average**~~

FAR index	Standard score
Phonological Index	90
Fluency Index	73
Mixed Index	81
Comprehension Index	97
FAR Total Index	**84**

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Case: Neil- FAR Subtest Interpretation

Simultaneous

KEY INTERPRETATION	Score	Percentile	Descriptor
Isolated Word Reading Fluency – the student reads a list of phonologically regular words arranged in order of increasing difficulty in 60 seconds.	86	18%	Below Average
Irregular Word Reading Fluency – the student reads a list of phonologically irregular words arranged in order of increasing difficulty in 60 seconds.	71	3%	Moderately Below Average

➢He can apply decoding skills to familiar words but lacks an effective strategy when reading phonologically irregular words.

Simultaneous

Simultaneous

KEY INTERPRETATION	Score	Percentile	Descriptor
Visual Perception – requires the student to identify letters printed backwards that are embedded within an array of words. A timed measure of text perception.	75	5%	Moderately Below Average
Orthographic Processing – the student must recall a group of letters in the correct order that are embedded within a target word presented for 1 second. A measure of orthographic working memory skills.	72	4%	Moderately Below Average

➢He struggles with both text perception, as well as orthographic processing, both of which are hindering his reading pace and fluency

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Case: FAM Scores for Neil

FAM Index	Standard Score	Percentile	Range
Procedural Index – measures the ability to count, order, and/or sequence numbers.	94	34%	Average
Verbal Index – measures the ability to automatically identify numbers, retrieve facts, and understand math terminology.	86	18%	Below Average
Semantic Index – measures the ability to determine magnitude representations, estimation, pattern recognition, and quantitative reasoning.	72	3%	Moderately Below Average
FAM TOTAL INDEX	79	8%	Moderately Below Average

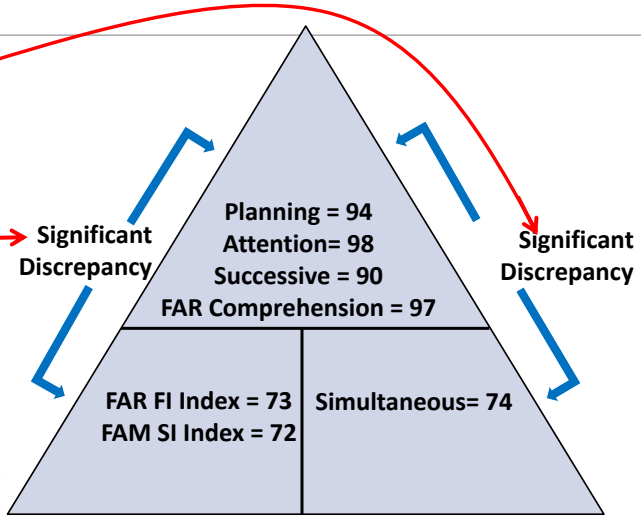
Like Verbal Spatial Relations subtest

Simultaneous

82

Case: Discrepancy Consistency for Neil

- 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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Case: FAM Report Writer
Websites and Apps

1. Khan Academy *https://www.khanacademy.org/*

The Khan Academy is full of helpful videos explaining a variety of math topics, as well as other academic topics. There is an initial pre-test upon first logging in that determines appropriate starting levels.

2. Hooda Math *http://www.hoodamath.com/*

Hooda Math is geared toward helping kids practice and learn through games and computer activities. Specific math topics include addition, subtraction, multiplication, addition, geometry, basic physics, fractions, integers, and algebra.

3. Estimation 180 *http://www.estimation180.com*

Estimation 180 is a website that presents a new estimation challenge every day of the school year.

4. Patrick JMT *http://patrickjmt.com/*

The "JMT" in Patrick JMT stands for "Just Math Tutorials." This website has clear math videos on a variety of math related topics.

5. Cool Math 4 Kids *https://www.coolmath4kids.com*

A highly entertaining and interactive website offering games, activities, puzzles, and challenges for a variety of math topics for children.

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PASS Theory Based on Brain Function – Successive Processing

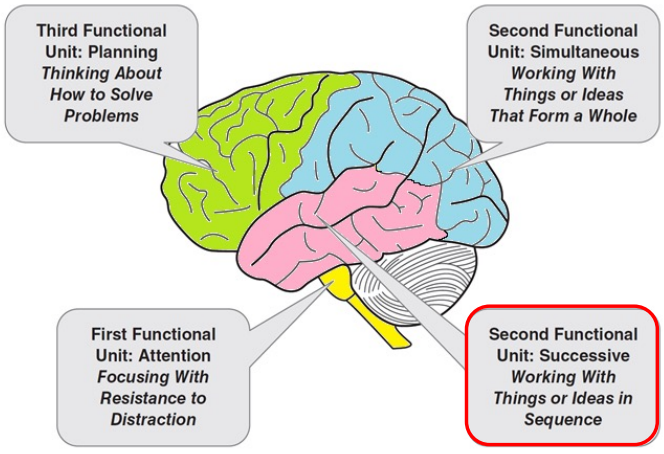


Figure 1.2 Three Functional Units and Associated Brain Structures

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

85

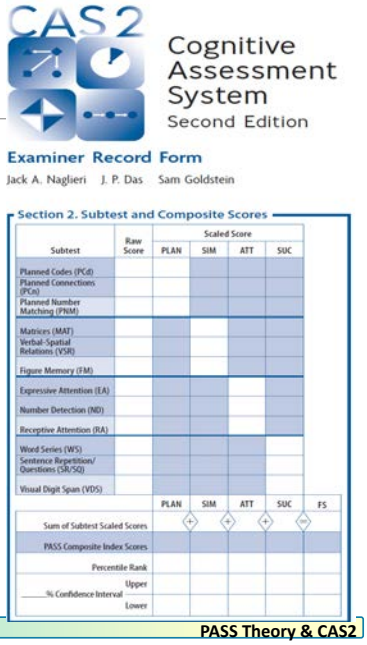
85

Successive Subtests

Word Series

Sentence Repetition or Sentence Questions

Visual Digit Span



PASS Theory: Successive

- **Successive** processing is a basic psychological process we use to manage stimuli in a specific serial order
  - Stimuli form a chain-like progression
  - Recall a series of words
  - Decoding words
  - Letter-sound correspondence
  - Phonological tasks
  - Understanding the syntax of sentences
  - Comprehension of written instructions

Recall of Numbers in Order
Successive Processing

4	3	8	6	1

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?***

CAS2: Rating Scale Successive

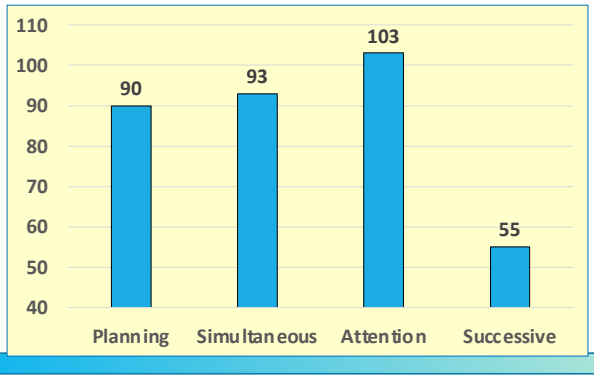
Directions for Items 31–40. These questions ask how well the child or adolescent remembers things in order. The questions ask about working with numbers, words, or ideas in a series. The questions also ask about doing things in a certain order. Please rate how well the child or adolescent works with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

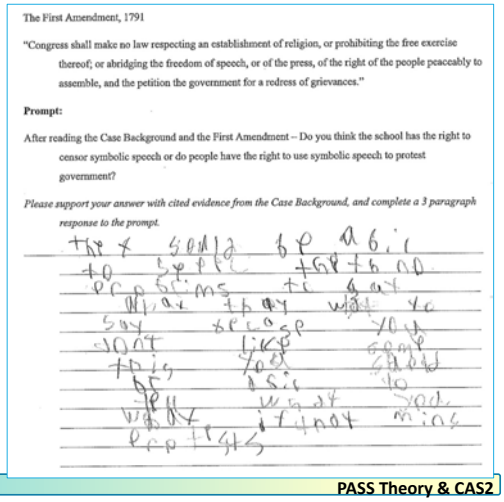
During the past month, how often did the child or adolescent . . .	Never	Rarely	Sometimes	Frequently	Always
31. recall a phone number after hearing it?	0	1	2	3	4
32. remember a list of words?	0	1	2	3	4
33. sound out hard words?	0	1	2	3	4
34. correctly repeat long, new words?	0	1	2	3	4
35. remember how 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

PASS and Handwriting

- Acquisition of handwriting demands Successive processing




The First Amendment, 1791

"Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof; or abridging the freedom of speech, or of the press, of the right of the people peaceably to assemble, and the petition the government for a redress of grievances."

Prompt:

After reading the Case Background and the First Amendment – Do you think the school has the right to censor symbolic speech or do people have the right to use symbolic speech to protest government?

Please support your answer with cited evidence from the Case Background, and complete a 3 paragraph response to the prompt.

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CASE by Tulio Otero: Alex (C.A. 6-7 GRADE 1)

REASON FOR REFERRAL

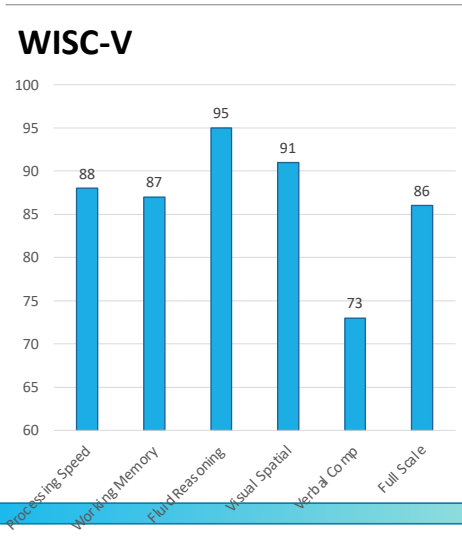
Is classified as Intellectual Disability. Team is interested in changing eligibility

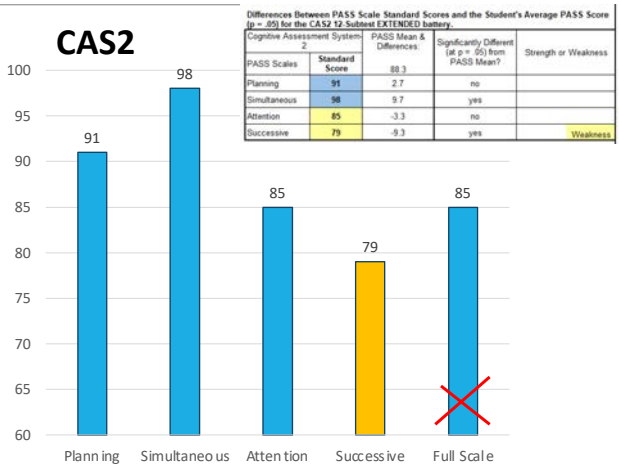
- Academic:
  Limited skill to identify letters sounds
  Possible ASD
- Conversationally Bilingual
- Behavior:
  - Difficulty following directions
  - Attention concerns

Note: this is not a picture of Alex

91

WISC-V and CAS2 Scores Alex (C.A. 6-7 Grade 1)





Differences Between PASS Scale Standard Scores and the Student's Average PASS Score (p = .05) for the CAS2 12 Subtest EXTENDED battery.

Cognitive Assessment System-2 PASS Scales	Standard Score	PASS Mean & Differences: 88.3	Significantly Different (at p = .05) from PASS Mean?	Strength or Weakness
Planning	91	2.7	no	
Simultaneous	98	9.7	yes	
Attention	85	-3.3	no	
Successive	79	-9.3	yes	Weakness

PASS Theory & CAS2

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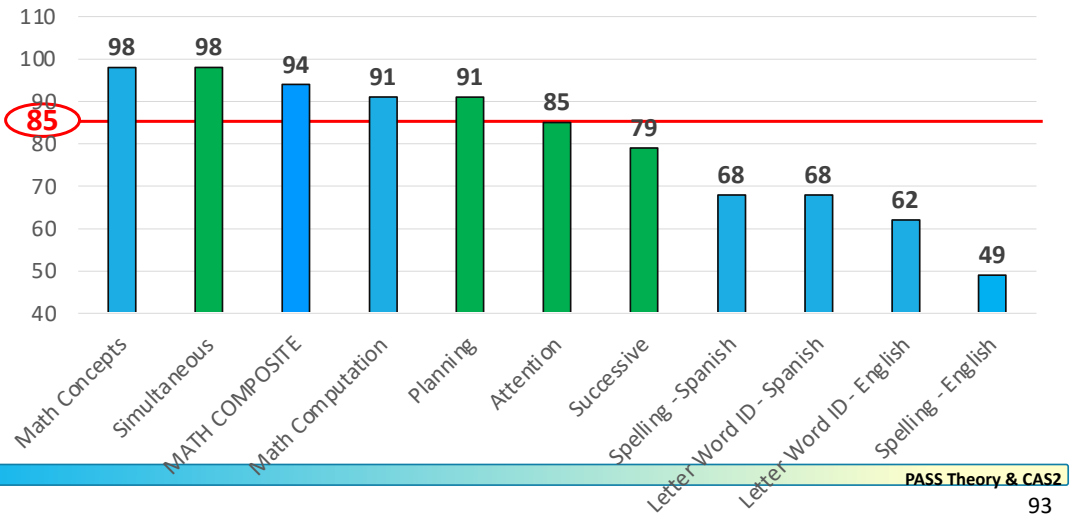
KTEA 3 and CAS2 Scores for Alex



PASS Theory & CAS2

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PASS Strengths & Weakness with KTEA

CAS2 12-Subtest Extended Battery

BOX #1 Is there a PASS Pattern of Strenghts and Weaknesses (Discrepancy 1)?

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

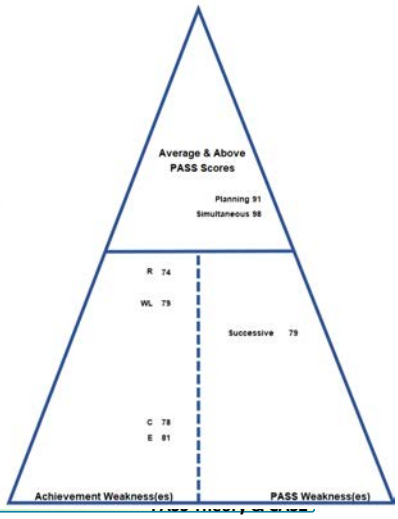
Cognitive Assessment System-2		PASS Mean & Differences		
PASS Scales	Standard Score	88.3	Significantly Different (at p = .05) from PASS Mean?	Strength or Weakness
Planning	91	2.7	no	
Simultaneous	98	9.7	yes	
Attention	85	-3.3	no	
Successive	79	-9.3	yes	Weakness

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).
3. See Essentials of CAS2 Assessment Interpretation Chapter for more details and examples. Note: Comparisons at p = .05

BOX #2 Are high PASS scores significantly different from low achievement scores (Discrepancy 2)? Are low PASS scores similar to low achievement scores (Consistency)?

			PASS Scores from CAS2			
			Planning	Simultaneous	Attention	Successive
			91	98	85	79
Kaufman Test of Educational Achievement 3rd Edition						
Standard Scores						
74	R	Reading	Discrepant	Discrepant	Consistent	Consistent
98	M	Math				
79	WL	Written Language	Discrepant	Discrepant	Consistent	Consistent
	ASB	Academic Skills Battery				
	SS	Sound-Symbol				
	DF	Decoding Fluency				
	RF	Reading Fluency				
	RU	Reading Understanding				
	OL	Oral Language				
	OR	Oral Fluency				
78	C	Comprehension	Discrepant	Discrepant	Consistent	Consistent
81	E	Expression		Discrepant	Consistent	Consistent
	OP	Orthographic Processing				
	AF	Academic Fluency				

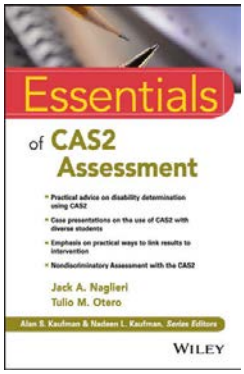


94

94

Alex and PASS (by Dr. Otero)

- Alex's profile is revealing
- He has good processing scores:
  - Simultaneous = 91 and Planning = 98
- He has a "disorder in one or more of the basic psychological processes
  - Attention = 85 and Successive = 79
- Using the Discrepancy Consistency Method (1999, 2017) he meets criteria for SLD (see Naglieri & Otero, 2017).



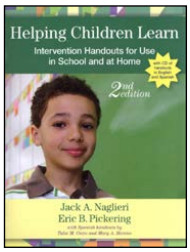
95

Intervention Protocol (Naglieri & Kryza, 2019)

1. Help child understand their PASS strengths and challenges (be intentional & transparent)
2. Encourage Motivation & Persistence (student's mindset)
3. Encourage strategy use (build skill sets)
4. Encourage independence and self-efficacy (metacognition, self-assessment & self-correction)

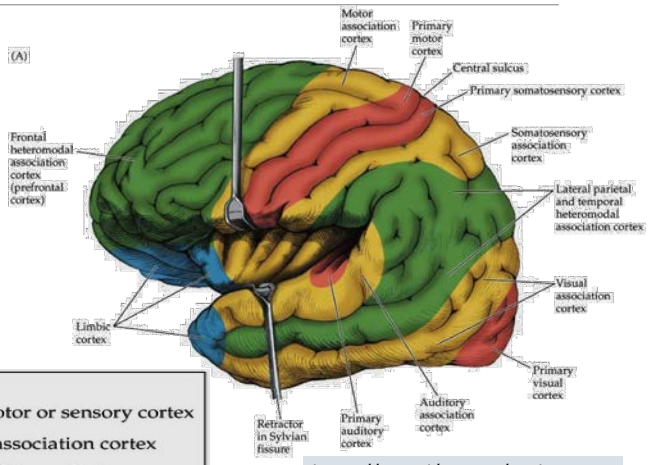
Be Intentional and Transparent

- Give Alex the PASS handouts
  - *"The test showed that your brain is strong in seeing the BIG PICTURE (Simultaneous Processing) and*
  - *Recognizing strategies to use. (Planning Processing) Does that make sense to you?*
- Explain to him the PASS areas that are challenges for him
  - The part of your brain that makes learning challenging for you is the part that helps pay close attention, not get distracted by things around you, and keep all kinds of information in sequence (in order).
  - We're going to work on using your strengths and helping you develop more skills.



Heteromodal Association Cortex (Goldberg, 2006)

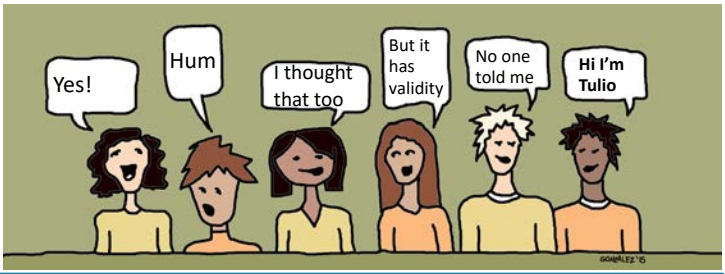
- Our brains ***merge stimuli*** coming in from the senses (unimodal association cortex) into one stream of information in the **Heteromodal association cortex**
- (green areas)



https://goo.gl/images/cyphg7

Core Group Activity

- **QUESTIONS:**
- **What are the advantages of using PASS theory as measured by the CAS2**
- **What are the obstacles?**



PASS → CAS2

A Theory Based on Brain Function	• Thinking vs Knowing and Social Justice
From PASS to CAS2	• A Different View of People
Research Update	• PASS and Equity – Measure Thinking not Knowing • To *g* or not to *g*
Administration and Interpretation Issues	• Test order, subtest interpretation, etc.
Reasons To Change	• Validity of PASS Theory

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PASS Comprehensive System

(Naglieri, Das, & Goldstein, 2014)

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CAS2 for (Ages 5-18 yrs.)

NEW! CAS2 Digital (English and Spanish) coming in 2021 with integrated scoring and narrative report

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CAS2 Online Score & Report

http://www.proedinc.com/customer/ProductView.aspx?ID=7277

- Enter data at the subtest level or enter subtest raw scores
- Online program converts raw scores to standard scores, percentiles, etc. for all scales.
- A narrative report with graphs and scores is provided

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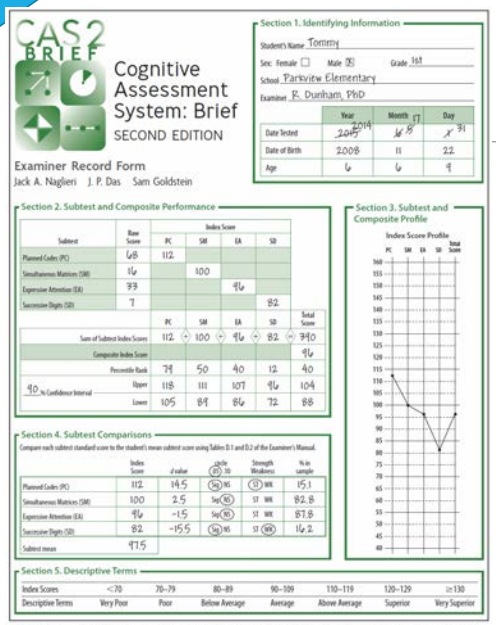

CAS2 BRIEF
Cognitive Assessment System: Brief
SECOND EDITION
Examiner Record Form
Jack A. Naglieri J. P. Das Sam Goldstein

Section 1. Identifying Information
Student's Name Tommy
Sex: Female ☐ Male ☒ Grade 1st
School Parkview Elementary
Examiner R. Dunham, PhD

	Year	Month	Day
Date Tested	2014	11	31
Date of Birth	2008	11	22
Age	6	6	9

Section 2. Subtest and Composite Performance

Subtest	Raw Score	Index Score PC	SM	EA	SD
Planned Codes (PC)	68	112			
Simultaneous Matrices (SM)	16		100		
Expressive Attention (EA)	33			96	
Successive Digits (SD)	7				82

	PC	SM	EA	SD	Total Score
Sum of Subtest Index Scores	112	100	96	82	390
Composite Index Score					96
Percentile Rank	79	50	40	12	40
90% Confidence Interval Upper	118	111	107	96	104
90% Confidence Interval Lower	105	89	86	72	88

Section 3. Subtest and Composite Profile
Index Score Profile
PC SM EA SD Total Score

Section 4. Subtest Comparisons
Compare each subtest standard score to the student's mean subtest score using Tables D.1 and D.2 of the Examiner's Manual.

	Index Score	d value	Sig (.05)	Strength Weakness	% in sample
Planned Codes (PC)	112	14.5	Sig NS	ST WK	15.1
Simultaneous Matrices (SM)	100	2.5	Sig NS	ST WK	82.8
Expressive Attention (EA)	96	-1.5	Sig NS	ST WK	87.8
Successive Digits (SD)	82	-15.5	Sig .05	ST WK	16.2
Subtest mean	97.5				

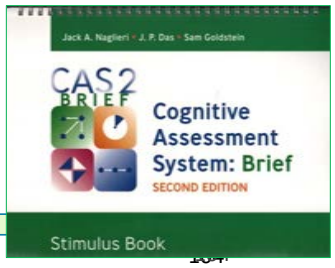
Section 5. Descriptive Terms

Index Scores	<70	70–79	80–89	90–109	110–119	120–129	≥130
Descriptive Terms	Very Poor	Poor	Below Average	Average	Above Average	Superior	Very Superior

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

CAS2: Brief

- Yields PASS and Total standard scores (Mn 100, SD 15)
- Directions for administration are in the Record Form
- For Re-evaluations and Screening
- All items are different from CAS2
  - Planned Codes
  - Simultaneous Matrices
  - Expressive Attention
  - Successive Digits



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CAS2: Brief

- CAS2: Brief takes 20 minutes to administer
- It is intended to be used for instructional planning during Tier 2
- It is also used as a screening tool for a fast evaluation of PASS neurocognitive ability scores
- Also helpful for re-evaluations

CAS2: Brief Standard Scores

Planning	Attention	Simultaneous	Successive
133	91	103	125
94	82	94	78
61	91	90	100
91	92	97	100
70	83	100	70
65	75	66	50
40	89	68	80
87	87	87	85
89	85	90	70
96	103	101	85
59	61	62	55
99	98	105	125
56	82	92	85
103	83	92	80
97	99	100	115
94	89	99	90
95	76	97	122
81	98	70	75
96	105	100	95
75	89	98	55
81	79	104	110
77	85	100	80
52	81	80	65
94	82	82	100
56	145	106	115
86	95	75	80
80	74	82	75
134	89	107	85
96	83	85	100
88	79	73	80
64	129	98	121
98	118	85	75
85	97	75	80
98	107	102	83
64	91	90	65
83	91	93	60
MN	83.8	91.2	90.2	86.5
SD	20.1	15.6	12.8	20.4

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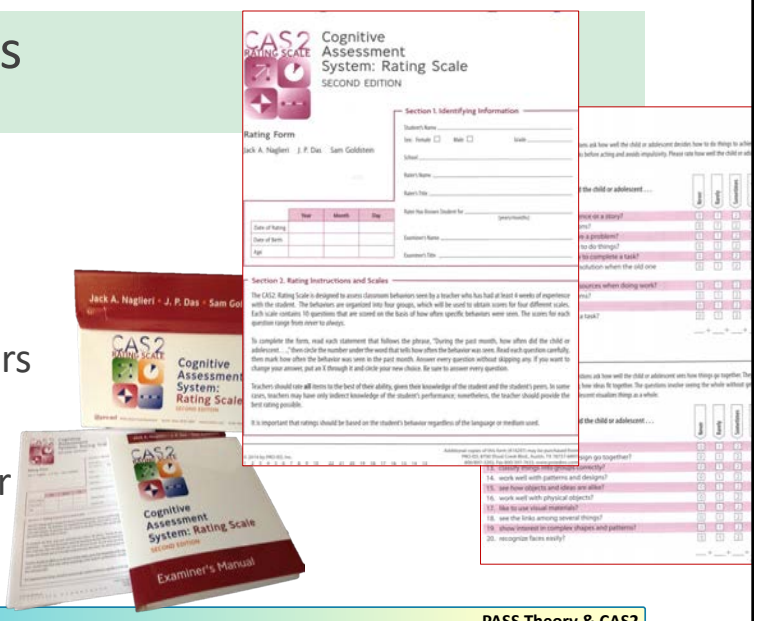
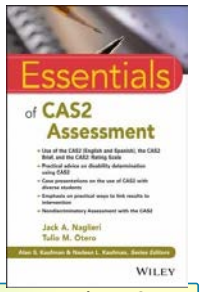
CAS2 Rating Scales
(Ages 4-18 yrs.)

- The CAS2: Rating measures behaviors associated with PASS constructs
- Completed by teachers and can be used by psychologists, special educators and regular educators



CAS2, CAS2 Online Score and Report Write, CAS2-Espanol, CAS2: Brief, CAS2 Rating Scale

- This book is the most complete discussion of PASS theory and its measurement
- Chapters cover all versions of the CAS2 as well as the online scoring and report writer
- Administration, scoring, interpretation
- Reliability, validity (PASS profiles, evidence of test fairness,
- Discrepancy Consistency Method for SLD
- Intervention planning and clinical case studies



CAS2 is Different

My Professional Journey	• An Awakening About Traditional Intelligence Tests
A Theory Based on Brain Function	• Thinking vs Knowing and Social Justice
From PASS to CAS2	• A Different View of People
Research Update	• PASS and Equity – Measure Thinking not Knowing • To *g* or not to *g*
Administration and Interpretation Issues	• Test order, subtest interpretation, etc.
Reasons To Change	• Validity of PASS Theory

PASS Theory & CAS2

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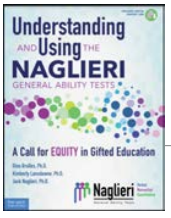
Race and Ethnic Differences for *Traditional* and *Second-Generation* Intelligence Tests



	By Race	By Ethnicity
TRADITIONAL Tests that require knowledge	**9.4**	**6.4**
Otis-Lennon School Ability Test (district wide)	13.6	-
Stanford-Binet IV (normative sample)	12.6	-
CogAT7 Nonverbal	11.8	7.6
WISC-V (normative sample)	11.6	-
WJ- III (normative sample)	10.9	10.7
K-ABC II Fluid-Crystallized Index	9.4	9.8
WISC-V (statistical controls normative sample)	8.7	5.4
K-ABC II Mental Processing Index	8.1	8.2
CogAT-Total (V, Q & NV)	7.0	4.5
CogAT7 - Verbal	6.6	5.3
CogAT- Nonverbal	6.4	2.9
CogAT7-Quantitative	5.6	3.6
SECOND GENERATION Tests that require minimal knowledge	**4.5**	**2.5**
CAS-2 (normative sample)	6.3	4.5
Naglieri General Ability Test-Verbal (Ns= 392 & 709)	6.2	1.0
Naglieri General Ability Test-Quantitative (Ns= 392 & 709)	5.5	4.4
CAS (statistical controls normative sample)	4.8	4.8
Naglieri General Ability Test-Nonverbal (Ns= 392 & 709)	4.4	0.3
CAS-2 (statistical controls normative sample)	4.3	1.8
Naglieri General Ability Test-Quantitative (N = 6,098)	4.3	2.9
NNAT (matched samples)	4.2	2.8
Naglieri General Ability Test-Verbal (N= 5,739)	4.2	1.3
Naglieri General Ability Test-Nonverbal (N=6,887)	3.5	0.9
CAS-2 Brief (normative samples)	2.0	2.8

Note: The results summarized here were reported for the Otis-Lennon School Ability Test by Avant and O'Neal (1986); Stanford-Binet IV by Wasserman (2000); Woodcock-Johnson III race differences by Edwards and Oakland (2006) and ethnic differences by Sotelo-Dynega, Ortiz, Flanagan, and Chaplin (2013); CogAT7 by Carman, Walther and Bartsch (2018) and Lohman (2016), WISC-V by Kaufman, Raiford, and Coalson (2016); Kaufman Assessment Battery for Children-II by Lichtenberger, Volker, Kaufman & Kaufman, (2006) and Scheiber, C., Kaufman, A.S. Which of the Three KABC-II Global Scores is the Least Biased?. Journal of Pediatric Neuropsychology 1, 21–35 (2015); CAS by Naglieri, Rojahn, Matto, and Aquilino (2005); CAS-2 and CAS2:Brief by Naglieri, Das, and Goldstein (2014a and 2014b), Naglieri Nonverbal Ability Test by Naglieri and Ronning (2000), Naglieri General Ability Tests by Naglieri, Brulles, and Lansdowne (2022 & 2024) and Selvamenan et al., 2024 (in press). UPDATED 3.6.24

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PASS Scores for Hispanics

Naglieri, Rojahn, Matto (2007)

Available online at www.sciencedirect.com

ScienceDirect

ELSEVIER

INTELLIGENCE

Intelligence 35 (2007) 568 – 579

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

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Received 16 May 2006; received in revised form 6 November 2006; accepted 6 November 2006

Available online 8 January 2007

Abstract

Hispanics have become the largest minority group in the United States. Hispanic children typically come from working class homes with parents who have limited English language skills and educational training. This presents challenges to psychologists who assess these children using traditional IQ tests because of the considerable verbal and academic (e.g., quantitative) content. Some researchers have suggested that intelligence conceptualized on the basis of psychological processes may have utility for assessment of children from culturally and linguistically diverse populations because verbal and quantitative skills are not included. This study examined Hispanic children's performance on the Cognitive Assessment System (CAS; [Naglieri, J.A., and Das, J.P. (1997). Cognitive Assessment System. Itasca, IL: Riverside.]) which is ... the Planning, Attention, Simultaneous, and Successive (PASS) theory of intelligence. The scores of Hispanic ... White (N = 1956) children on the four PASS ...

Hispanic White difference on CAS Full Scale of **4.8**

WJ-III and ELL Hispanic Students

(Sotelo-Dynega, Ortiz, Flanagan & Chaplin, 2013)

Table 1

WJ III GIA and Test Performance Differences Between LEPs and the WJ III Standardization Sample Mean

	Sample		WJ III Sample				
WJ III Test	*M*	*SD*	*M*	*SD*	Difference	*t*	*d*
General Intellectual Ability	89.34	11.78	100	15	−10.64	−7.07**	−.90
Verbal Comprehension	80.38	14.09	100	15	−19.62	−10.87***	−1.40
Concept Formation	87.16	12.20	100	15	−12.84	−8.22***	−1.05
Numbers Reversed	95.23	12.46	[illegible]	15	−4.77	−2.96*	−0.38
Visual-Auditory Learning	95.62	14.56	[illegible]	15	−4.38	−2.35*	−0.30
Sound Blending	97.82	11.57	[illegible]	15	−2.18	−1.47	−0.19
Visual Matching	[illegible]	[illegible]	[illegible]	[illegible]	−1.07	−0.85	−0.11
Spatial Relations	[illegible]	[illegible]	[illegible]	[illegible]	−0.82	−0.758	−0.10

*p < .05. **p < .01. ***p ...

11-point mean score difference in GAI

Table 2

Differences Among the NYSESLAT Proficiency Group's WJ III, GIA Mean Score, and the WJ III Standardization Sample Mean

	Sample		WJ III Sample
NYSESLAT Proficiency Group	*M*	*SD*	*M*
Beginner	71.75	3.95	100
Intermediate	82.29	8.66	[illegible]
Advanced	89.55	9.17	100
Proficient	101	9.23	100

*p < .001.

As English skills go down so does the GAI

PASS scores – English and Spanish

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

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

Jack A. Naglieri
George Mason University

Tulio Otero
Columbia College, Elgin Campus

Brianna DeLauder
George Mason University

Holly Matto
Virginia Commonwealth University

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 us...

Keywords: bilingual assessment, i... tem, non-biased assessment

APPLIED NEUROPSYCHOLOGY: CHILD, 0: 1–9, 2012
Copyright © Taylor & Francis Group, LLC
ISSN: 2162-2965 print/2162-2973 online
DOI: 10.1080/21622965.2012.670547

Psychology Press

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

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Departments of Clinical Psychology and School Psychology, Chicago School of Professional Psychology, Chicago, Illinois

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, ...

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

CAS in Italy

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

Psychological Assessment

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

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

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University of Virginia and Devereux Center for Resilient Children

Stefano Taddei
University of Florence

Kevin Williams
Multi-Health Services, Toronto, Ontario, Canada

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

Measuring Thinking using CAS

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

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

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

Jack A. Naglieri
George Mason University

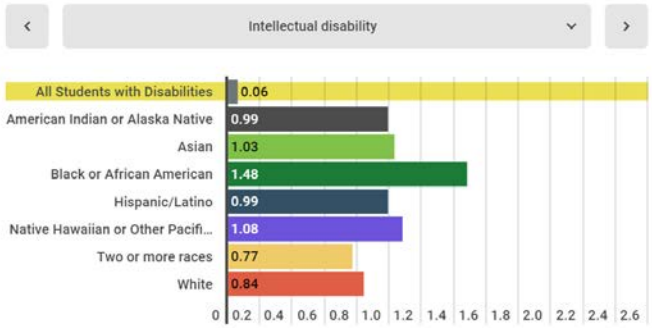
Johannes Rojahn
The Ohio State University

OSEP Office of Special Education Programs
Office of Special Education and Rehabilitative Services

OSEP Fast Facts: Race and Ethnicity of Children with Disabilities Served under IDEA Part B

For the purposes of this fact sheet, racial ethnic groups are defined in the IDEA Part B Child Count and Educational Environments for School Year 2019-2020, OSEP Data Documentation. https://www2.ed.gov/programs/osepidea/618-data/collection-documentation/data-documentation-files/part-b/child-count-and-educational-environment/idea-partb-childcountandedenvironment-2019-20.pdf

Risk Ratio of Students with Disabilities by Disability Category and by Specific Race and Ethnicity, Ages 5 (in kindergarten) through 21: SY 2019-20



The relative risk (or risk ratio) of students with disabilities served under IDEA by disability category and race and Ethnicity is the probability of a student with a disability being identified for intellectual disability. The higher the number, the larger the probability. For example, nationally, Black Students with Disabilities were 1.48 times more likely to be identified with intellectual disability compared to all students with disabilities.

https://sites.ed.gov/idea/osep-fast-facts-race-and-ethnicity-of-children-with-disabilities-served-under-idea-part-b/

https://idaamerica.org/ida_today/disproportionate-identification-of-students-of-color-in-special-education/

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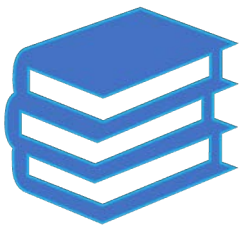

Research on Interpretation of Test Scores and PSW

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Support for ‘g’

PsycARTICLES: Journal Article

Structural validity of the Wechsler Intelligence Scale for Children–Fifth Edition: Confirmatory factor analyses with the 16 primary and secondary subtests.

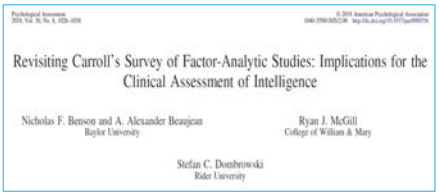
© Request Permissions

Canivez, Gary L.,Watkins, Marley W.,Dombrowski, Stefan C.

Canivez, G. L., Watkins, M. W., & Dombrowski, S. C. (2017). Structural validity of the Wechsler Intelligence Scale for Children–Fifth Edition: Confirmatory factor analyses with the 16 primary and secondary subtests. *Psychological Assessment*, 29(4), 458–472. https://doi.org/10.1037/pas0000358

Journal Information
Journal TOC

- …The small portions of variance uniquely captured by [subtests]… render the group factors [scales]of questionable interpretive value independent of g (FSIQ general intelligence)
- Present CFA results confirm the EFA results (Canivez, Watkins, & Dombrowski, 2015); Dombrowski, Canivez, Watkins, & Beaujean (2015); and Canivez, Dombrowski, & Watkins (2015).



Revisiting Carroll’s Survey of Factor-Analytic Studies: Implications for the Clinical Assessment of Intelligence

Nicholas F. Benson and A. Alexander Beaujean, Baylor University
Ryan J. McGill, College of William & Mary
Stefan C. Dombrowski, Rider University

- **The results of this study indicate that most cognitive abilities specified in** John Carroll’s **three-stratum theory have little-to-no interpretive relevance above and beyond that of general intelligence**.

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Research Supports ‘g’ but little More

Benson, N. F., Beaujean, A. A., McGill, R. J, & Dombrowski, S. C. (2018). Revisiting **Carroll’s Survey of Factor-Analytic Studies**: Implications for the Clinical Assessment of Intelligence. *Psychological Assessment,* 30, 8, 1028–1038.

Canivez, G. L., Watkins, M. W., & Dombrowski, S. C. (2017). Structural validity of the **Wechsler Intelligence Scale for Children–Fifth Edition:** Confirmatory factor analyses with the 16 primary and secondary subtests. *Psychological Assessment, 29,* 458-472.

Canivez, G. L., & McGill, R. J. (2016). Factor structure of the **Differential Ability Scales–Second Edition**: Exploratory and hierarchical factor analyses with the core subtests. *Psychological Assessment, 28,* 1475-1488. http://dx.doi.org/10.1037/pas0000279

Canivez, G. L., & McGill, R. J. (2016). Factor structure of the **Differential Ability Scales-Second Edition**: Exploratory and hierarchical factor analyses with the core subtests. Psychological Assessment, 28, 1475–1488. https://doi.org/10.1037/pas0000279

Canivez, G. L. (2008). Orthogonal higher order factor structure of the **Stanford-Binet Intelligence Scales-Fifth Edition** for children and adolescents. School Psychology Quarterly, 23, 533–541.

Dombrowski, S. C., **Canivez, G. L.,** & Watkins, M. W. (2017, May). Factor structure of the 10 **WISC–V** primary subtests across four standardization age groups. *Contemporary School Psychology.* Advance online publication.

Dombrowski, S. C., McGill, R. J., & Canivez, G. L. (2017). Exploratory and hierarchical factor analysis of the **WJ IV Cognitive** at school age. *Psychological Assessment, 29,* 394-407.

McGill, R. J., & **Canivez, G. L.** (2017, October). Confirmatory factor analyses of the **WISC–IV Spanish** core and supplemental Subtests: Validation evidence of the Wechsler and CHC models. *International Journal of School and Educational Psychology*. Advance online publication.

Watkins, M. W., Dombrowski, S. C., & **Canivez, G. L.** (2017, October). Reliability and factorial validity of the **Canadian Wechsler Intelligence Scale for Children–Fifth Edition**. *International Journal of School and Educational Psychology*.

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School Psychology Quarterly
2011, Vol. 26, No. 4, 305–317

1045-3830/11/$12.00 DOI: 10.1037/a0025973

Hierarchical Factor Structure of the Cognitive Assessment System: Variance Partitions From the Schmid–Leiman (1957) Procedure

Gary L. Canivez
Eastern Illinois University

Orthogonal higher-order factor structure of the Cognitive Assessment System (CAS; Naglieri & Das, 1997a) for the 5–7 and 8–17 age groups in the CAS standardization sample is reported. Following the same procedure as recent studies of other prominent intelligence tests (Dombrowski, Watkins, & Brogan, 2009; Canivez, 2008; Canivez & Watkins, 2010a, 2010b; Nelson & Canivez, 2011; Nelson, Canivez, Lindstrom, & Hatt, 2007; Watkins, 2006; Watkins, Wilson, Kotz, Carbone, & Babula, 2006), three- and four-factor CAS exploratory factor extractions were analyzed with the Schmid and Leiman (1957) procedure using MacOrtho (Watkins, 2004) to assess the hierarchical factor structure by sequentially partitioning variance to the second- and first- order dimensions as recommended by Carroll (1993, 1995). Results showed that greater portions of total and common variance were accounted for by the second-order, global factor, but compared to other tests of intelligence CAS subtests measured less second-order variance and greater first-order Planning, Attention, Simultaneous, and Successive (PASS) factor variance.

Keywords: CAS, construct validity, hierarchical exploratory factor analysis, Schmid–Leiman higher-order analysis, structural validity

Support for PASS Scales

- "…compared to the WISC–IV, WAIS–IV, SB–5, RIAS, WASI, and WRIT, the CAS subtests had less variance apportioned to the higher-order general factor (g) and *greater proportions of variance apportioned to first-order (PASS…) factors*.
- This is consistent with the subtest selection and construction in an attempt to measure PASS dimensions linked to PASS theory … and neuropsychological theory (Luria)." (p. 311)

Papadopoulos, et al., 2023

Unravelling the Multifaceted Nature of Intelligence: A Correlated Factor Model Approach with Insights from the PASS Theory

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- Our results unambiguously support the notion that intelligence is not a unidimensional entity but a composite of distinct cognitive processes…which posits separate cognitive domains for Planning, Attention, Simultaneous and Successive processing… [these] emerged as the most fitting representation of intelligence [and] the best fit to the data.
- This outcome reinforces the notion that intelligence is a multifaceted construct, with various cognitive abilities working in concert, corroborating previous findings (e.g., Das & Kirby, 2022; Naglieri, 2015; Papadopoulos et al., 2018).

PASS

- Given that PASS scales CAN be interpreted it is important to know
  - if these scales yield PROFILES that can be used in a Pattern of Strengths and Weaknesses approach to eligibility determination AND
  - do PASS scores relate to achievement more than traditional intelligence tests?

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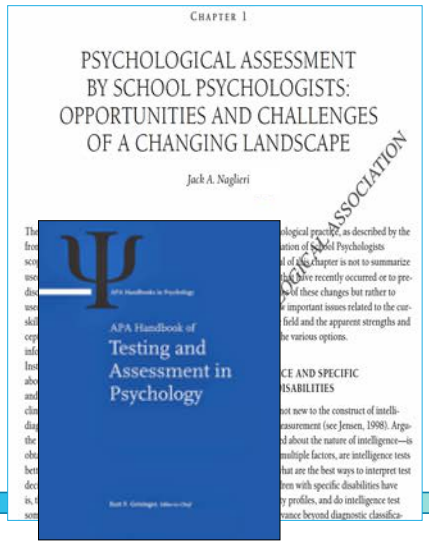
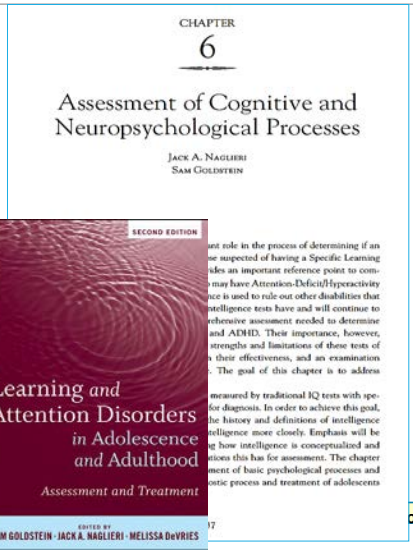
PASS Scales can be Interpreted and SHOULD be: Profiles





ory & CAS2

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Profiles across tests reveal the power of PASS

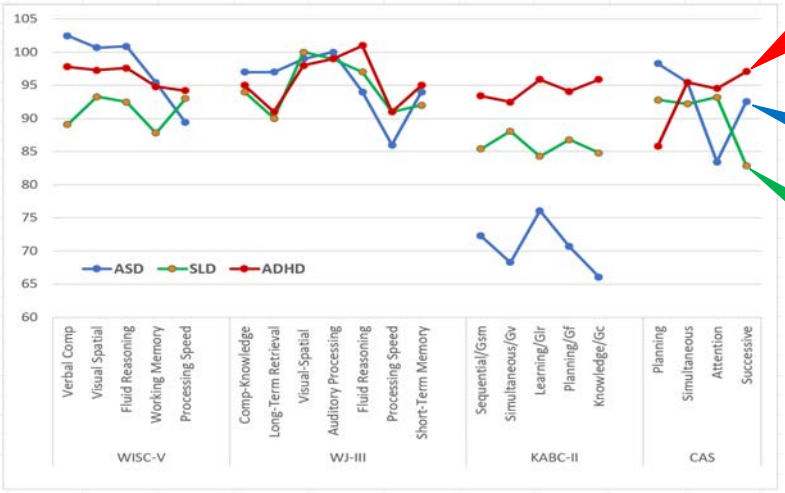

RESEARCH ARTICLE

WILEY

PASS neurocognitive assessment of children with autism spectrum disorder

Tulio M. Otero | Jack A. Naglieri

Patterns of Strengths & Weaknesse



ADHD (Low Planning)

ASD – Low Attention

Dyslexia – Low Successive

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Otero, T. M., & Naglieri, J. A. (2022). PASS neurocognitive assessment of children with autism spectrum disorder. Psychology in the Schools, 1–8. https://doi.org/10.1002/pits.22798

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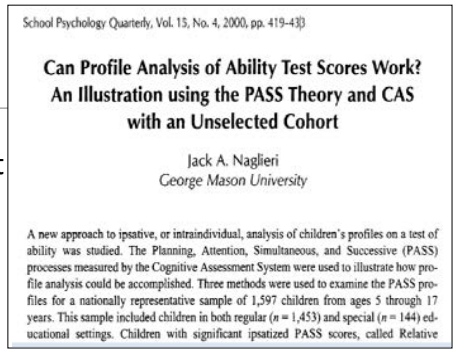
Research on PASS Profiles

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. 419-433

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


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

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

"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.

PASS Theory & CAS2

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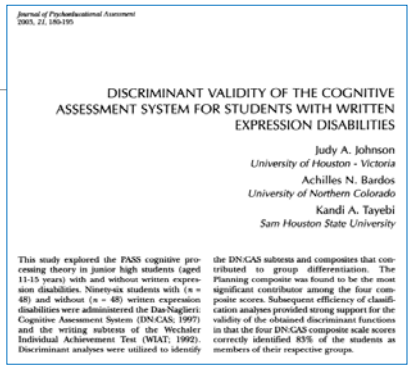
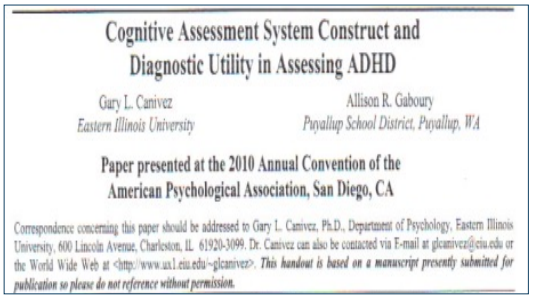
Research on PASS Profiles

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



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



Cognitive Assessment System Construct and Diagnostic Utility in Assessing ADHD

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

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

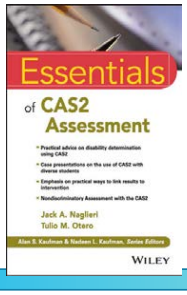
- "the present study demonstrated the potential of the CAS to correctly identify students who **demonstrated behaviors consistent with ADHD** diagnosis."

Intelligence Tests and Prediction

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

Correlations: We can do better!

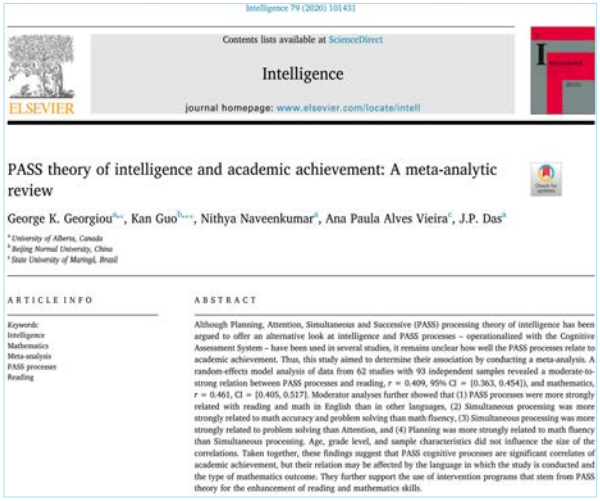
Average correlations between IQ Scales with total achievement scores from *Essentials of CAS2 Assessment* Naglieri & Otero (2017)



Correlations Between Ability and Achievement Test Scores			Average Correlation: All Scales	Average Correlation: 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 Series and Concept Formation; Auditory Processing = Phonological processing.

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



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PASS theory of intelligence and academic achievement: A meta-analytic review

George K. Georgiou[a,*], Kan Guo[b,**], Nithya Naveenkumar[a], Ana Paula Alves Vieira[c], J.P. Das[a]

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[b] Beijing Normal University, China
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Meta-analysis
PASS processes
Reading

ABSTRACT

Although Planning, Attention, Simultaneous and Successive (PASS) processing theory of intelligence has been argued to offer an alternative look at intelligence and PASS processes – operationalized with the Cognitive Assessment System – have been used in several studies, it remains unclear how well the PASS processes relate to academic achievement. Thus, this study aimed to determine their association by conducting a meta-analysis. A random-effects model analysis of data from 62 studies with 93 independent samples revealed a moderate-to-strong relation between PASS processes and reading, $r = 0.409$, 95% CI = [0.363, 0.454]), and mathematics, $r = 0.461$, CI = [0.405, 0.517]). Moderator analyses further showed that (1) PASS processes were more strongly related with reading and math in English than in other languages, (2) Simultaneous processing was more strongly related to math accuracy and problem solving than math fluency, (3) Simultaneous processing was more strongly related to problem solving than Attention, and (4) Planning was more strongly related to math fluency than Simultaneous processing. Age, grade level, and sample characteristics did not influence the size of the correlations. Taken together, these findings suggest that PASS cognitive processes are significant correlates of academic achievement, but their relation may be affected by the language in which the study is conducted and the type of mathematics outcome. They further support the use of intervention programs that stem from PASS theory for the enhancement of reading and mathematics skills.

Georgiou, G., Guo, K., Naveenkumar, N., Vieira, A. P. A., & Das, J. P. (2019) PASS theory of intelligence and academic achievement: A meta-analytic review. *In press Intelligence.*

PASS Research

- "The results clearly show that when CAS Full Scale is used it correlates **.60 with reading** and **.61 with mathematics**."
- "**These correlations are significantly stronger … than the correlations reported in previous meta-analysis for other measures of intelligence** (e.g., Peng et al., 2019; Roth et al., 2015)…(e.g., WISC) that include tasks (e.g., Arithmetic, Vocabulary)..."
- "if we **conceptualize intelligence as … cognitive processes that are linked to the functional organization of the brain**" it leads to significantly higher relations with academic achievement."
  - "and these processes have direct implications for instruction and intervention…"

Twice Exceptional

- Tests of general ability are **not** sufficient for assessment of students who may be gifted and have a specific learning disability (SLD), autism, ADHD, etc.
- Most defensible way to assess for a SLD, for example, is to use the *Cognitive Assessment System-Second Edition (CAS2)* for the following reasons
  - CAS2 measures 'basic psychological processes' – the key to uniting the definition of SLD with the method of detecting it, it yields the smallest race difference, yields profiles for special populations, predicts achievement better than any other tests and has implications for instruction

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A Study of Gifted Students

- N = 142
  - Similar numbers of girls and boys in Grade 4, 5 and 6.
  - all native speakers of English
  - came from families of middle to upper-middle socioeconomic background
- Identified according to this definition:
  - "Giftedness is exceptional potential and/or performance across a wide range of abilities in one or more of the following areas: general intellectual, specific academic, creative thinking, social, musical, artistic and kinesthetic" (Alberta Education, 2012, p. 6).

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A Study of Gifted Students

- Tests given
  - WASI –II (Vocabulary and Matrix Reasoning)
  - Woodcock-Johnson III (WJ-III; Woodcock, McGrew, & Mathers, 2001) Broad Reading score from: Letter-Word Identification, Reading Fluency, and Passage Comprehension
  - Cognitive Assessment System (CAS; Naglieri & Das, 1997) to measure PASS neurocognitive processes

A Study of Gifted Students

WASI-II FSIQ slightly higher than CAS FS - but CAS shows more variability

- Average WASI-III Full Scale and CAS Full scale were similar but CAS standard deviation and range was higher

Table 1
Descriptive Statistics for WASI-II, WJ-III Achievement, and Cognitive Assessment System (CAS) Scores (N = 142)

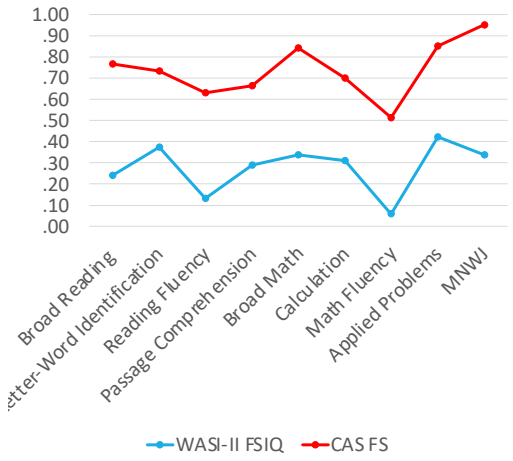
Variable	*Mean*	*SD*	*Min*	*Max*
WJ-III Achievement				
Broad Reading	**125**	14	97	166
Broad Math	**116**	13	91	162
Mean WJ	**117**	10	94	152
WASI-II FSIQ	**123**	8	105	145
CAS Full Scale	**118**	12	91	148
Planning	**110**	12	77	146
Simultaneous	**121**	16	88	152
Attention	**113**	13	79	141
Successive	**111**	11	81	137

A Study of Gifted Students

CAS Full Scale scores correlated significantly higher with WJ-III achievement scores than the WASI-II

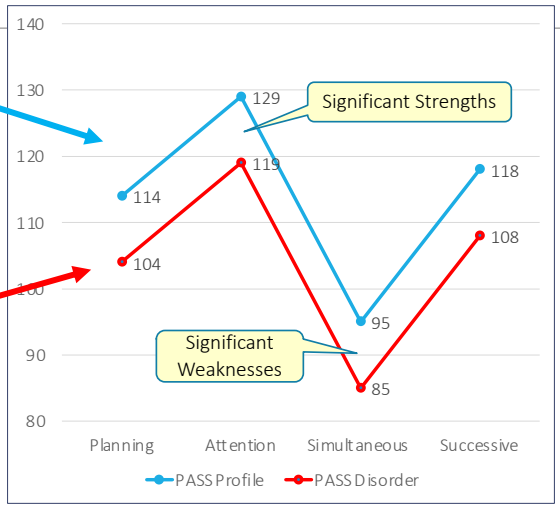
Table 2
Pearson Correlations of WASI-II FSIQ, Cognitive As

	WASI-II FSIQ	CAS FS
Broad Reading	**.24**	**.53**
Broad Math	**.34**	**.50**
Mean WJ-III	**.34**	**.62**



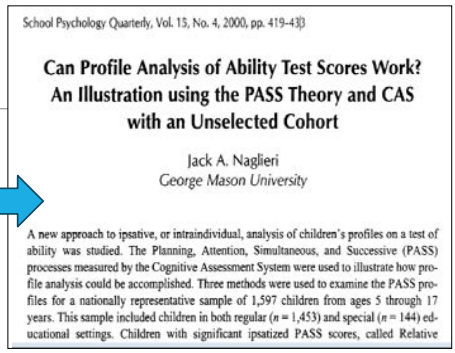
Two Types of PASS Profiles

- Two sets of PASS scores were studied
  - Significant variation in relation to student's average has instructional relevance
  - Significant variation in relation to student's average AND a standard score less than 90 (< 25th %tile) supports designation as SLD



Research on PASS Profiles

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

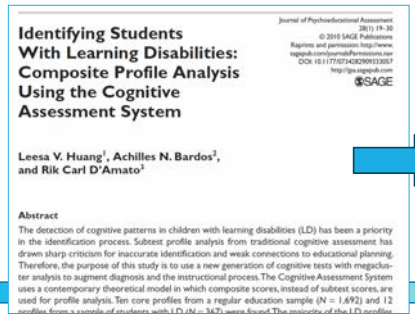


School Psychology Quarterly, Vol. 15, No. 4, 2000, pp. 419-433

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



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

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 megaclustering 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

"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.

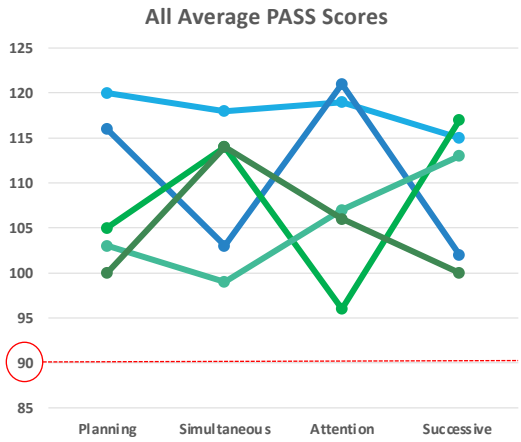
Haung, Bardos, D'Amato (2010)

- PASS Profiles from standardization sample

TABLE 4. PASS PROFILES FOR THE GENERAL EDUCATION SAMPLE.

Cluster	1	2	3	4	5	6	7	8	9	10
Planning	*120*	116	105	103	100	*111*	*102*	87	93	79
Simultaneous	118	103	114	99	*114*	102	86	101	92	*82*
Attention	119	*121*	96	107	106	106	99	87	*96*	81
Successive	115	102	*117*	*113*	100	89	99	*103*	82	81
Average PASS	118	110	108	106	105	102	96	94	91	81
Range	5	19	21	14	14	23	15	16	14	3

Note: PASS scores less than 90 are in bold font. Range of PASS scores within each group greater than 10 are in bold.



Haung, Bardos, D'Amato (2010)

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Simultaneous	118	103	114	99	*114*	102	**86**	101	92	*82*
Attention	119	*121*	96	107	106	106	99	**87**	*96*	**81**
Successive	115	102	*117*	*113*	100	**89**	99	*103*	**82**	**81**
Average PASS	118	110	108	106	105	102	96	94	91	81
Range	5	19	21	14	14	23	15	16	14	3

Note: PASS scores less than 90 are in bold font. Range of PASS scores within each group greater than 10 are in bold.

PASS Theory & CAS2

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Naglieri (2001) Regular and Special Ed Groups

- CW = Significant difference between any PASS score and the student's average PASS score and one of the PASS scores is below 80, 85 or 90.
- CWAW = There is a significantly low PASS score AND a similarly low Achievement test score

TABLE 6. Number and Percentages of Children in Regular Education (n = 1,453) and Special Education (n = 144) with PASS Relative Weakness and Cognitive Weaknesses at Three Levels and Cognitive and Academic Weaknesses at Three Levels

	CW < 80		CW < 85		CW < 90		RW		CWAW < 80		CWAW < 85		CWAW < 90	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Regular Education	196	13.5	304	20.9	423	29.1	610	42.0	94	6.5	172	11.8	281	19.3
Special Education	46	31.9	52	36.1	60	41.7	74	51.4	40	27.8	47	32.6	56	38.9
χ^2 Value	40.54*		17.45*		9.79*		4.73		77.39*		48.6*		30.1*	

Note: Percentages are based on the Regular Education and Special Education samples sizes of 1,453 and 144, respectively. χ^2 values marked with an asterisk are significant at 0.05 using Bonferroni correction.

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A Study of Gifted Students

- 54% of gifted students had a PASS score that was significantly different from that student's average PASS score
  - That means the students has a specific neurocognitive processing strength or weakness (i.e., learning profile)

Table 3.

Percentages of Gifted Students with Significant Variability in PASS Standard Scores (N = 142).

		Planning	Simultaneous	Attention	Successive	PASS
PASS Weakness	n	25	6	18	28	77
	%	18%	4%	13%	20%	54%
PASS Strength	n	7	58	13	12	90
	%	5%	41%	9%	8%	63%

A Study of Gifted Students

- The number of gifted students who have a PASS score that is significantly different from that student's average PASS score AND the score is < 90; and with low achievement score.

These students have a specific PASS processing weakness less than 90; suggesting instructional modifications

Percentages of Gifted Students with Significant Variability in PASS and Achievement Test Scores (N = 142).

		Planning	Simultaneous	Attention	Successive	PASS
PASS <90	n	4	0	4	4	12
	%	3%	0%	3%	3%	8%
PASS & Skills <90	n	3	0	2	1	6
	%	2%	0%	1%	1%	4%

These students with low PASS scores AND low WJ-III achievement indicates a Specific Learning Disability

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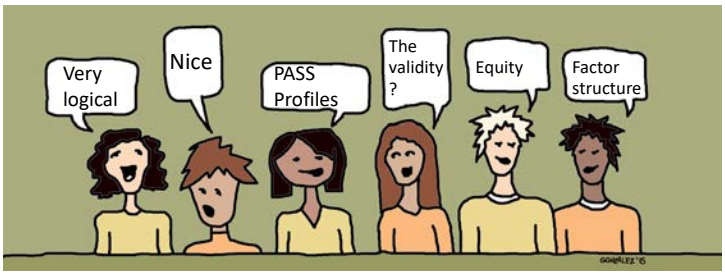
Core Group Activity

- **QUESTION:**
  - **Which research findings was most impactful?**
  - **What questions do you still have?**



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CAS2 is Different

A Theory Based on Brain Function	• Thinking vs Knowing and Social Justice
From PASS to CAS2	• A Different View of People
Research Update	• PASS and Equity – Measure Thinking not Knowing • To *g* or not to *g*
Administration and Interpretation Issues	• Test order, subtest interpretation, etc.
Reasons To Change	• Validity of PASS Theory

PASS Theory & CAS2

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Answering the Question: "Why the student struggles?"

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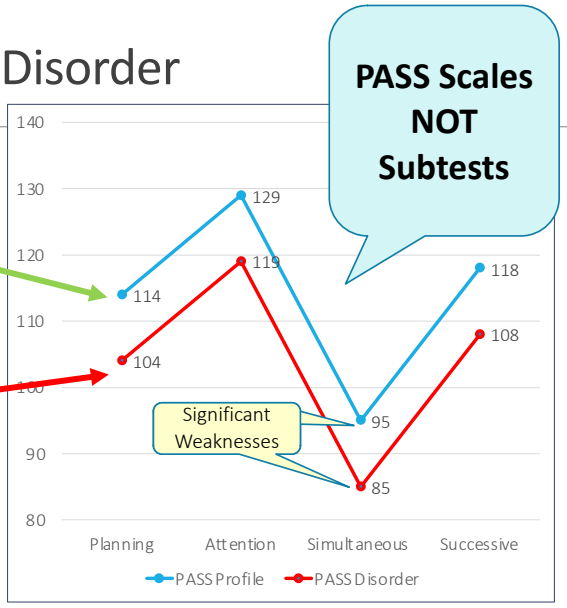
How to Determine a Disorder

- Two criteria for a disorder
  - Significant variation in relation to student's average has *instructional relevance*
  - Significant variation in relation to student's average **AND** a standard score less than 90 (< 25th %tile) *supports designation as SLD*



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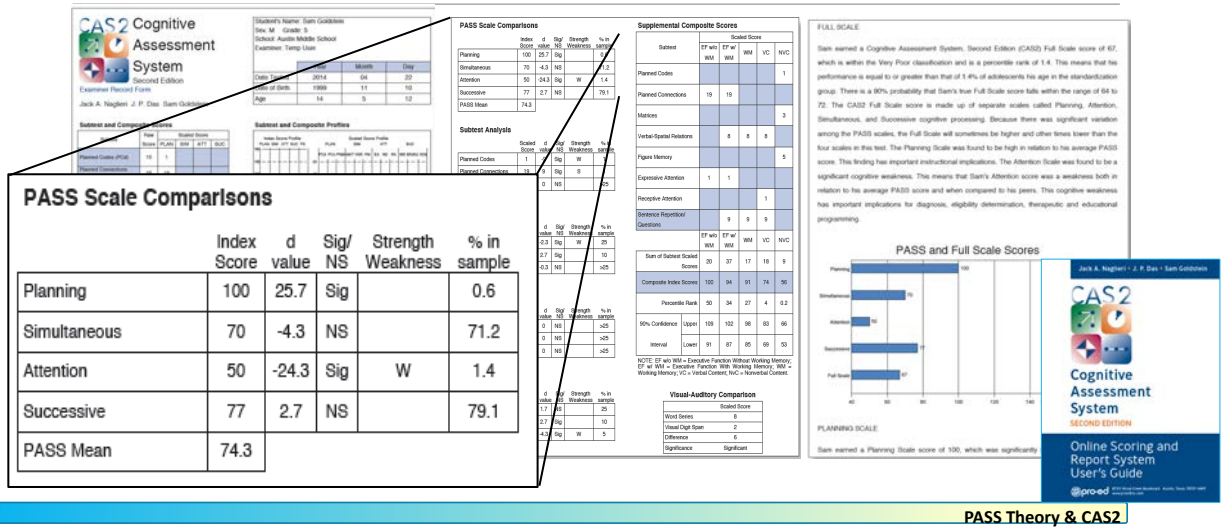
Online Scoring and Report Writer



PASS Scale Comparisons

	Index Score	d value	Sig/ NS	Strength Weakness	% in sample
Planning	100	25.7	Sig		0.6
Simultaneous	70	-4.3	NS		71.2
Attention	50	-24.3	Sig	W	1.4
Successive	77	2.7	NS		79.1
PASS Mean	74.3				

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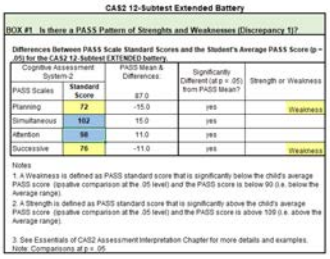
CAS2 Achievement Analyzer for PSW

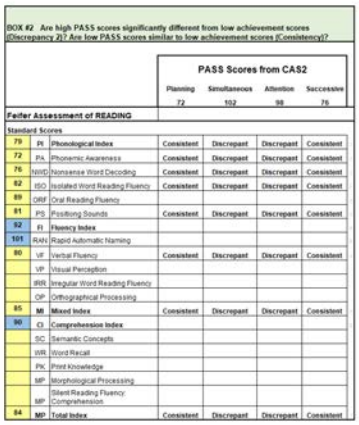

CAS2 12-Subtest Extended Battery

BOX #1 Is there a PASS Pattern of Strengths and Weaknesses (Discrepancy 1)?

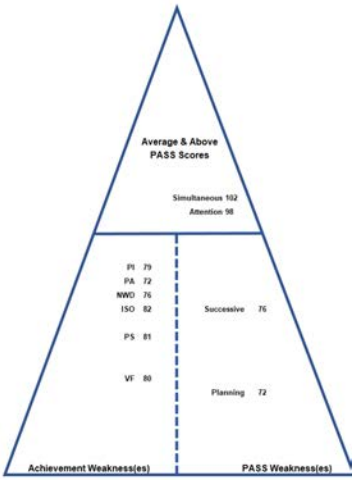
Differences Between PASS Scale Standard Scores and the Student's Average PASS Score (p = .05) for the CAS2 12-Subtest EXTENDED battery.

Cognitive Assessment System-2 PASS Scales	Standard Score	PASS Mean & Differences: 87.0	Significantly Different (at p = .05) from PASS Mean?	Strength or Weakness
Planning	72	-15.0	yes	Weakness
Simultaneous	102	15.0	yes	
Attention	98	11.0	yes	
Successive	76	-11.0	yes	Weakness

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).
3. See Essentials of CAS2 Assessment Interpretation Chapter for more details and examples.
Note: Comparisons at p = .05


BOX #2 Are high PASS scores significantly different from low achievement scores (Discrepancy 2)? Are low PASS scores similar to low achievement scores (Consistency)?

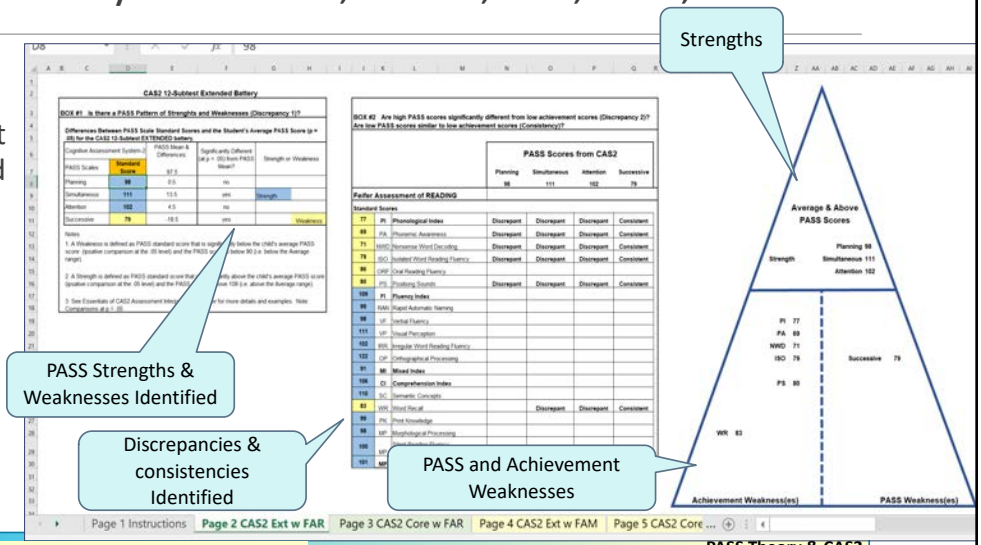
			PASS Scores from CAS2 Planning 72	Simultaneous 102	Attention 98	Successive 76
Feifer Assessment of READING						
Standard Scores						
79	PI	Phonological Index	Consistent	Discrepant	Discrepant	Consistent
72	PA	Phonemic Awareness	Consistent	Discrepant	Discrepant	Consistent
76	NWD	Nonsense Word Decoding	Consistent	Discrepant	Discrepant	Consistent
82	ISO	Isolated Word Reading Fluency	Consistent	Discrepant	Discrepant	Consistent
89	ORF	Oral Reading Fluency				
81	PS	Positing Sounds	Consistent	Discrepant	Discrepant	Consistent
92	FI	Fluency Index				
101	RAN	Rapid Automatic Naming				
80	VF	Verbal Fluency	Consistent	Discrepant	Discrepant	Consistent
	VP	Visual Perception				
	IRR	Irregular Word Reading Fluency				
	OP	Orthographical Processing				
85	MI	Mixed Index	Consistent	Discrepant	Discrepant	Consistent
90	CI	Comprehension Index				
	SC	Semantic Concepts				
	WR	Word Recall				
	PK	Print Knowledge				
	MP	Morphological Processing				
	SRF	Silent Reading Fluency: Comprehension				
84	MP	Total Index	Consistent	Discrepant	Discrepant	Consistent



Note: These **FREE** analyzers can be downloaded from www.jacknaglieri.com

CAS2 PSW Analyzer for WJ4, KTEA3, FAR, FAM, Bateria

- Enter PASS and Achievement test standard scores and all comparisons are evaluated



FREE – on www.jacknaglieri.com

Administration Details

- Core Battery is the first 2 subtests in each of the PASS scales
- Order of administration is IMPORTANT
  - Why is Planning first and Successive last?
- Should you use parts of the CAS2?
- Demonstration, Example, and Provide Help option

Table 1.2 Structure of the CAS Scales and Subtests in Order of Administration

Scale	Subtests
Planning	
	Matching Numbers (MN)
	Planned Codes (PCd)
	Planned Connections (PCn)
Simultaneous	
	Nonverbal Matrices (NvM)
	Verbal-Spatial Relations (VSR)
	Figure Memory (FM)
Attention	
	Expressive Attention (EA)
	Number Detection (ND)
	Receptive Attention (RA)
Successive	
	Word Series (WS) and or Sentence Repetition (SR)
	Speech Rate (SpR, ages 5–7 years) or Sentence Questions (SQ, ages 8–17 years)

Expose Example A and say,

Look at this page (point to the page). **Draw a line from the number 1 to the number 2, 2 to 3, 3 to 4, and 4 to 5.** Provide help if necessary.

With Example A still exposed, say,

I'm going to give you some more of these to do. You should always start from the number 1 (point to the number 1 in the bold box in Example A) **and draw a line from one number to the next until you get to the last number** (point to the number 5)**. Work as quickly as you can without making a mistake, and tell me when you're finished.**

Ready? (Provide a brief explanation if necessary.)

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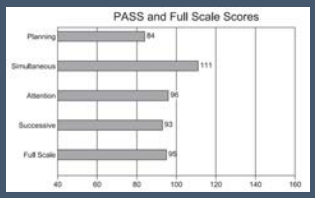
Interpretation Details

- Full Scale – Is misleading if there is PASS scale variability
- You may want to exclude the Full Scale completely



FULL SCALE

Tony earned a Cognitive Assessment System, Second Edition (CAS2) Full Scale score of 95, which is within the Average classification and is a percentile rank of 37. This means that his performance is equal to or greater than that of 37% of children his age in the standardization group. There is a 90% probability that Tony's true Full Scale score falls within the range of 91 to 99. The CAS2 Full Scale score is made up of separate scales called Planning, Attention, Simultaneous, and Successive cognitive processing. Because there was significant variation among the PASS scales, the Full Scale will sometimes be higher and other times lower than the four scales in this test. The Planning Scale was found to be a significant cognitive weakness. This means that Tony's Planning score was a weakness both in relation to his average PASS score and when compared to his peers. This cognitive weakness has important implications for diagnosis, eligibility determination, therapeutic and educational programming. The Simultaneous Scale was found to be a significant cognitive strength. This means that Tony's Simultaneous score was a strength both in relation to his average PASS score and when compared to his peers. This cognitive strength has important implications for instructional and educational programming.

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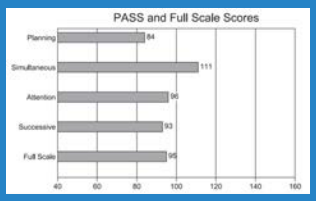
INTERPRETATION 123

FULL SCALE

Tony earned a Cognitive Assessment System, Second Edition (CAS2) Full Scale score of 95, which is within the Average classification and is a percentile rank of 37. This means that his performance is equal to or greater than that of 37% of children his age in the standardization group. There is a 90% probability that Tony's true Full Scale score falls within the range of 91 to 99. The CAS2 Full Scale score is made up of separate scales called Planning, Attention, Simultaneous, and Successive cognitive processing. Because there was significant variation among the PASS scales, the Full Scale will sometimes be higher and other times lower than the four scales in this test. The Planning Scale was found to be a significant cognitive weakness. This means that Tony's Planning score was a weakness both in relation to his average PASS score and when compared to his peers. This cognitive weakness has important implications for diagnosis, eligibility determination, therapeutic and educational programming. The Simultaneous Scale was found to be a significant cognitive strength. This means that Tony's Simultaneous score was a strength both in relation to his average PASS score and when compared to his peers. This cognitive strength has important implications for instructional and educational programming.



Interpretation Details

PASS SCALE – IPSATIVE AND NORMATIVE COMPARISONS

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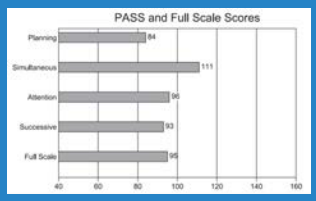
PLANNING SCALE

Tony's Planning score was significantly lower than his average PASS score and below the average range. This means that Tony performed particularly poorly on tests that required strategies for solving the problems on the Planning tests. He had trouble with development and use of good strategies, control of behavior, self-monitoring, and self-correction when completing these tests. Tony earned a CAS2 Planning Scale score of 84 which is within the Below Average classification and is a percentile rank of 14. The percentile rank indicates that Tony did as well as or better than 14% of others his age in the standardization group. There is a 90% probability that Tony's true Planning score is within the range of 79 to 92. This cognitive weakness has important implications for diagnosis, eligibility determination, and educational and therapeutic programming because children who are weak on the Planning Scale often have problems with tasks requiring strategies, completing schoolwork and other tasks on time, impulse control, self-monitoring, and social situations. There was no significant variation among his three subtest scores in the Planning Scale.

Interpretation Details

INTERPRET EACH SCALE FROM PASS THEORY



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- **A Theory Based on Brain Function** — Thinking vs Knowing and Social Justice
- **From PASS to CAS2** — A Different View of People
- **Research Update** — PASS and Equity – Measure Thinking not Knowing; To *g* or not to *g*
- **Administration and Interpretation Issues** — Test order, subtest interpretation, etc.
- **Reasons To Change** — Validity of PASS Theory

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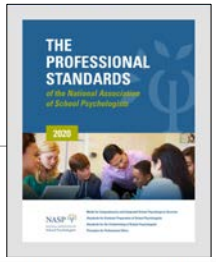
NASP Professional Standards 2020



NASP 2020 Professional Standards

GUIDING PRINCIPLE I.3 FAIRNESS, EQUITY, AND JUSTICE

In their words and actions, school psychologists promote fairness and social justice. They use their expertise to cultivate school climates that are safe, welcoming, and equitable to all persons regardless of actual or perceived characteristics, including race, ethnicity, color, religion, ancestry, national origin, immigration status, socioeconomic status, primary language, gender, sexual orientation, gender identity, gender expression, disability, or any other distinguishing characteristics.

Standard I.3.2 Correcting Discriminatory Practices

School psychologists strive to ensure that all children and youth have equal opportunity to participate in and benefit from school programs and that all students and families have access to and can benefit from school psychological services. They work to correct school practices that are unjustly discriminatory or that deny students or others their legal rights. School psychologists take steps to foster a school climate that is supportive, inclusive, safe, accepting, and respectful toward all persons, particularly those who have experienced marginalization in educational settings.

School psychologists function as change agents, using their skills in communication, collaboration, and consultation to advocate for necessary change at the individual student, classroom, building, district, state, and national levels.

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Summary: PASS theory and CAS2 (see Naglieri & Otero, 2017)

1. The PASS scales on the CAS2 measure *thinking* (i.e. basic psychological processing) rather than *knowing* (e.g., vocabulary, arithmetic etc.), making the test good for assessment of diverse populations and those with limited educational opportunity.
2. PASS scores can be easily obtained in 20 minutes (using the 4-subtest **CAS2 Brief**), 40 minutes (using the **8-subtest Core Battery**) or 60 minutes (using the **12-subtest Extended Battery**), scored and a narrative reports provided using the **online program**. (Digital CAS2 is in final stages of development.)
3. PASS results are easy for teachers, parents and the students themselves to understand because the concepts can be explained in non-technical language.
4. The PASS theory and the CAS2 provide a way to both define and assess 'basic psychological processes' so that practitioners can obtain scores that are consistent with state and federal IDEA guidelines.
5. The PASS scores are strongly correlated to achievement, show distinct patterns of strengths and weaknesses, are very useful for intervention planning.
6. The CAS2 in combination with achievement (especially the FAR, FAM and/or FAW) provides examiners with a reliable and defensible Discrepancy Consistency Method to identify students with SLD.
7. Research has shown that PASS scores have relevance to instruction and intervention.

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Questions and Thoughts Please

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