Interventions Based on Neurocognitive Strengths and Weaknesses

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- General information
- Copies of presentations, research and book chapters
- To ask a question

Presentation Outline

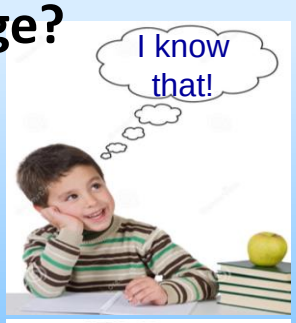
- **PASS neurocognitive approach to learning**
  - **Separate thinking from knowing**
- **PASS Strengths and Weaknesses**
- **Getting students to Think Smart!**
  - **Step 1 – inform the examinee**
  - **Step 2 – inform teachers and parents**
- **Case Studies**
- Conclusions

Neurocognitive Process

- *Neurocognitive process* is a modern term for concepts like ability or intelligence
- Neurocognitive processes lead to the acquisition of knowledge and skills
- Skills, like reading decoding or math calculation, are *not* examples of cognitive processes
- How to measure cognition…

Cognition or Knowledge?

- What does the student have to *know* to complete a task?
  - This is dependent on instruction
- How does the student have to *think* to complete a task?
  - This is dependent on the brain – PASS



Cognition or Knowledge

- Any test question that relies on knowledge is contaminated

NOT a good measure of ABILITY

This is a good measure of THINKING

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

The First IQ TEST: Alpha

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

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

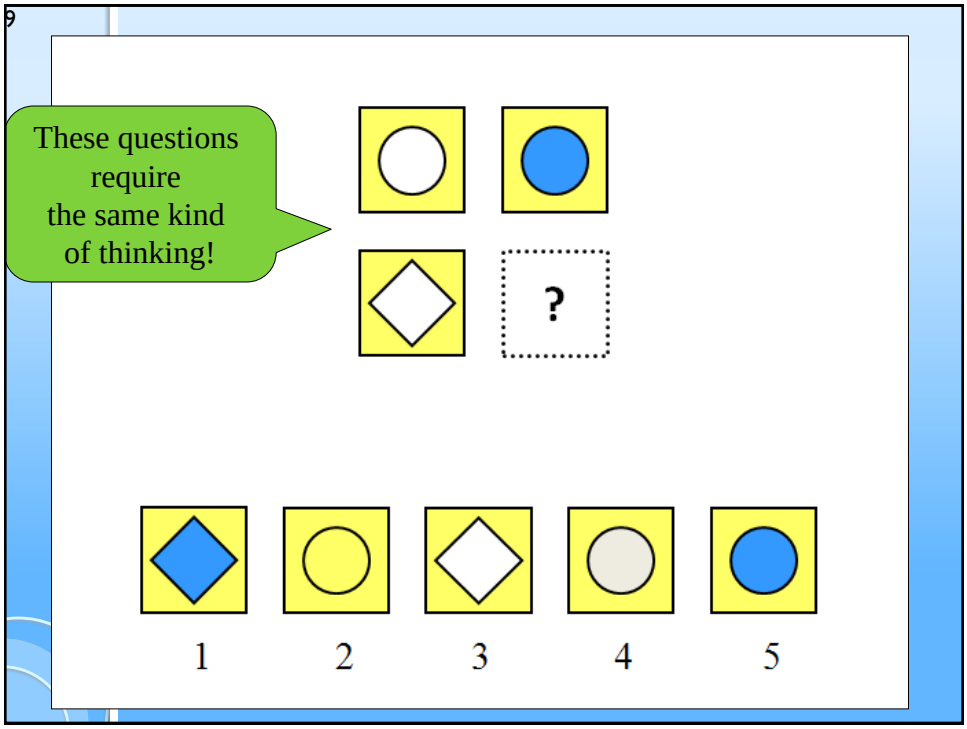
Thinking or Knowledge?

Solve this analogy:
Girl is to woman as boy is to _____?

Solve this analogy:
2 is 4 as 4 is to _____?

Solve this analogy:

D^7 is to G as F^7 is to ___?



What is a Cognitive Process?

- We must assess ability and achievement separately
- Assess *achievement* with tests that adequately evaluate the domain of interest (e.g., reading, math, etc.)
- Assess *neurocognitive* abilities using questions that are as free of academic content as possible

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What is a Cognitive Process

- Intelligence (IQ)?
  - Verbal/Quantitative/Nonverbal (circa 1917) and as most recently represented by the WISCV (Verbal Comprehension, Visual Spatial, Fluid Reasoning, Working Memory, Processing Speed)
  - **NO IQ test was designed to measure basic psychological processes**
- Intelligence redefined as brain function (PASS) **does**

conclusions

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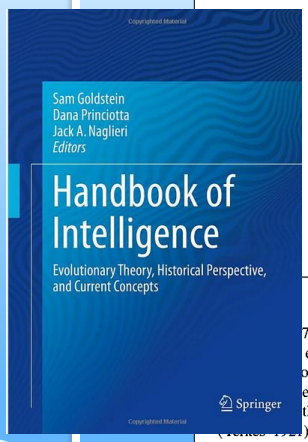
100 Years of Intelligence and IQ

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



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

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Jack A. Naglieri

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

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

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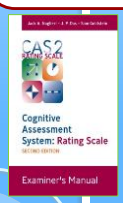
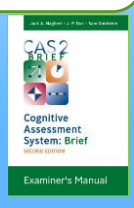
PASS Comprehensive System

(Naglieri, Das, & Goldstein, 2014; Naglieri, Moreno & Otero (2017)

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

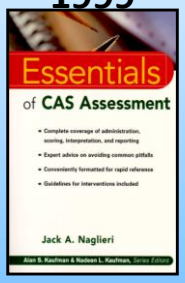




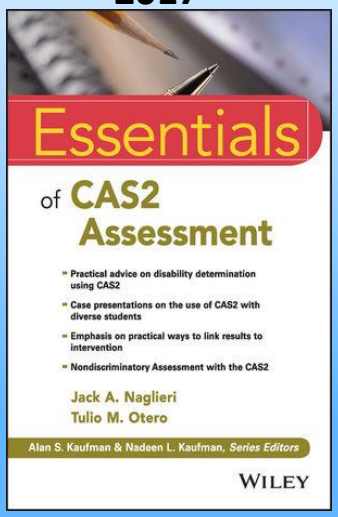
Discrepancy / Consistency Method (DCM)

- The Discrepancy / Consistency Method is a conceptual framework that was first introduced in 1999 (and now 2017)
- Similar models have been proposed

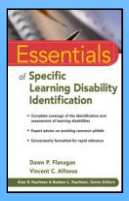
1999



2017



2011



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Discrepancy / Consistency Method

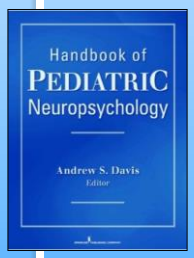
- The Discrepancy / Consistency Method is used to ensure that there is evidence of "a disorder in 1 or more of the basic psychological processes … which manifests itself in the imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations."
- The disorder in 1 or more basic psychological processes is found when a student shows a pattern of strengths and weaknesses in basic psychological processes, **and**…the imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations
- The result is two discrepancies and a consistency

PASS Neurocognitive Theory

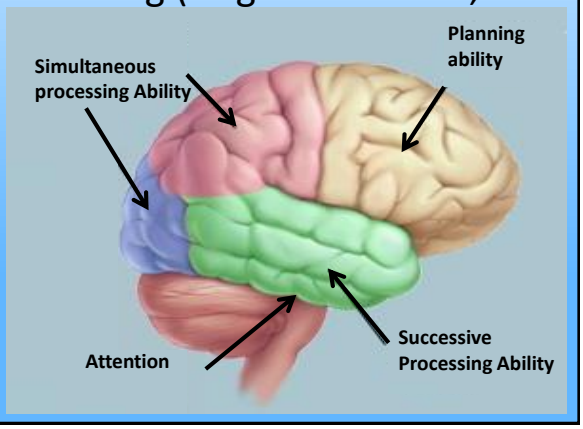
- **PASS** theory is a modern way to define 'ability' based on measuring neurocognitive abilities
- **P**lanning = THINKING ABOUT HOW YOU DO WHAT YOU DECIDE TO DO
- **A**ttention = BEING ALERT AND RESIST DISTRACTIONS
- **S**imultaneous = GETTING THE BIG PICTURE
- **S**uccessive = FOLLOWING A SEQUENCE

Brain, Cognition, & Intelligence

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

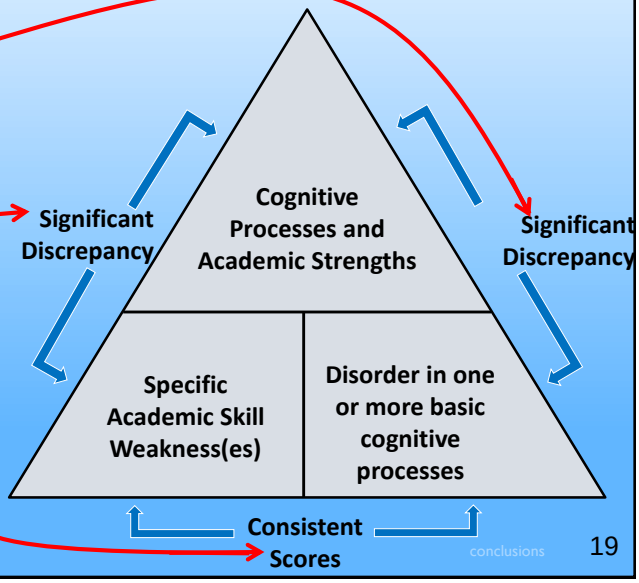


Naglieri, J. A. & Otero, T. (2011). Cognitive Assessment System: Redefining Intelligence from A Neuropsychological Perspective. In A. Davis (Ed.). *Handbook of Pediatric Neuropsychology (320-333)*. New York: Springer Publishing.



Discrepancy Consistency Model for SLD

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



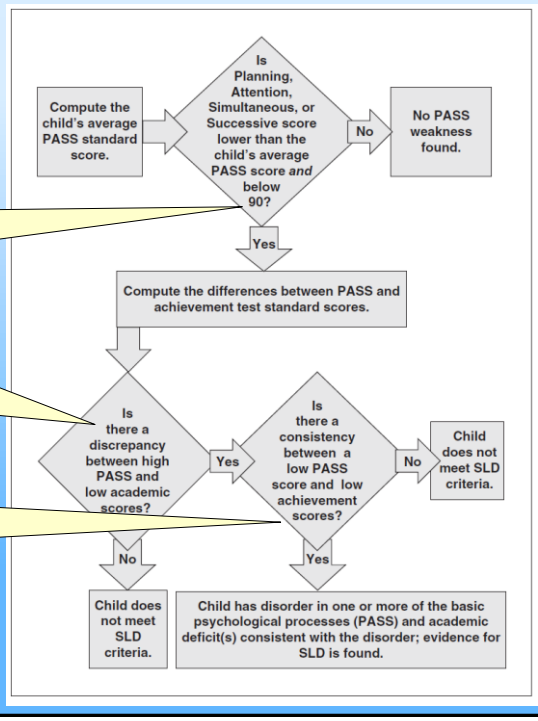
conclusions 19

DCM

Discrepancy between one of the PASS scores and the child's average PASS score

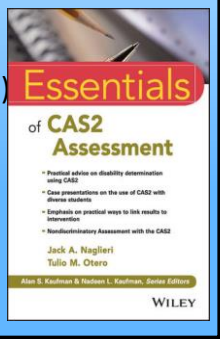
Discrepancy between the high PASS scores and achievement test scores

Consistency between the low PASS score and achievement test scores



PASS Achievement Comparisons

- The values needed for significance when comparing PASS to achievement provided by Naglieri & Otero (2017) for:
  - KTEA-3 (Kaufman & Kaufman, 2014)
  - WIAT-III (Wechsler, 2015)
  - Feifer Assessment of Reading (Feifer, 2015)
  - Feifer Assessment of Math (Feifer, 2016)
  - Bateria-III (Muñoz, et al., 2005)
  - WJ-IV (McGrew, et al., 2014)



PASS Differences With KTEA-3

Table A.1 Values Needed for Significance When Comparing the CAS2 Extended and Core Battery PASS and Full Scale Scores to All Scores From the KTEA-3

	CAS2 12-Subtest Extended Battery										CAS2 8-Subtest Core Battery									
	$p = .05$					$p = .10$					$p = .05$					$p = .10$				
	FS	Plan	Sim	Att	Suc	FS	Plan	Sim	Att	Suc	FS	Plan	Sim	Att	Suc	FS	Plan	Sim	Att	Suc
Subtests																				
Letter and Word Recognition	7	10	9	11	10	6	8	8	9	8	9	11	9	12	11	7	9	8	10	9
Reading Comprehension	11	13	12	14	13	9	11	10	11	11	12	14	13	15	14	10	11	11	12	12
Nonsense Word Decoding	8	10	9	11	10	6	8	8	9	8	9	11	10	12	11	7	9	8	10	9
Phonological Processing	10	12	11	12	12	8	10	9	10	10	11	12	11	14	13	9	10	9	11	11
Word Recognition Fluency	12	14	13	14	14	10	11	11	12	11	13	14	13	15	15	11	12	11	13	12
Composites																				
Reading	8	10	10	11	10	7	9	8	9	9	9	11	10	13	12	8	9	8	11	10
Math	7	10	9	10	10	6	8	7	9	8	8	10	9	12	11	7	9	8	10	9
Written Language	9	11	10	12	11	7	9	9	10	9	10	12	11	13	12	8	10	9	11	10
Academic Skills Battery	6	9	8	10	9	5	8	7	8	8	8	10	9	12	11	7	8	7	10	9
Sound-Symbol	8	10	9	11	10	6	8	8	9	8	9	11	10	12	11	7	9	8	10	10
Decoding Fluency	7	9	8	10	9	6	8	7	8	8	8	10	9	12	11	7	8	7	10	9
Reading Fluency	9	11	10	12	11	8	9	9	10	9	10	12	11	13	12	8	10	9	11	10

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DCM -> Pattern of Strengths Weaknesses

- Note: A 'disorder in one or more of the basic psychological processes' must be
  - Lower than the child's average PASS score
  - Lower than the national norm (< Average range)
- Once you have a significant PASS profile then interventions can follow
- Use the strengths to manage the weakness
- Build the students optimism and self image first

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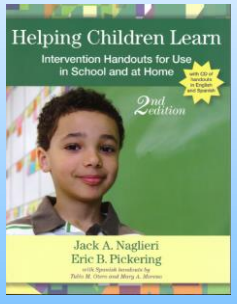
Our Goal…

- EMPOWER

NOT

Tell the Student about PSW

- Student need to know about their PASS strengths and weaknesses
- To address their mindset
- The student probably thinks that he/she is not smart



Measure of Mindset on www.jacknaglieri.com

Measure of Mindset (Teacher & Parent)

Jack A. Naglieri & Kathleen M. Kryza - Copyright © 2015

Name _____

Date _____

Instructions: These 10 questions ask about a child or adolescent's attitudes toward learning. Please read every question carefully and circle the number under the word that tells what you have observed about your child.

		Never	Sometimes	Most times	Always
1	He/she doesn't give up easily.	0	1	2	3
2	When things get hard he/she says, "I can do it!"	0	1	2	3
3	Failure leads him/her to try harder until the task is finished.	0	1	2	3
4	He/she views failure as an important part of learning.	0	1	2	3
5	He/she believes that you can do anything if you try hard enough.	0	1	2	3
6	He/she is afraid of failure.	0	1	2	3
7	When things get hard he/she avoids the work.	0	1	2	3
8	He/she believes that hard work usually does not pay off.	0	1	2	3
9	He/she is fast to give up on a task.	0	1	2	3
10	He/she sees failure as proof of a person's limitations.	0	1	2	3

Measure of Mindset (Child & Adolescent)

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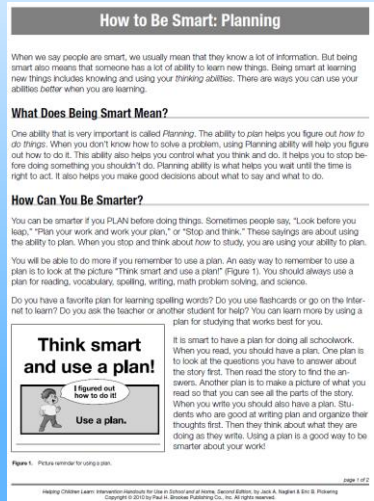
Name _____

Date _____

Instructions: These 10 questions ask about how you think and feel. The answers you give can help us know your thoughts about how you learn. Please read every question carefully and circle the number under the word that tells what you do.

		Never	Sometimes	Most times	Always
1	I don't give up easily.	0	1	2	3
2	When things get hard I say, "I can do it!"	0	1	2	3
3	When I fail I try harder until I get it done.	0	1	2	3
4	I believe that I can learn from my mistakes.	0	1	2	3
5	I think I can do almost anything if I try hard enough.	0	1	2	3
6	When I don't understand something I give up.	0	1	2	3
7	I do not like to be challenged.	0	1	2	3
8	When work is hard I think, "I can not do it."	0	1	2	3
9	When things get hard I do something else.	0	1	2	3
10	When I fail I do something else that is more fun.	0	1	2	3

Planning and Attention



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.

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!

Figure 1. Picture reminder for using a plan.

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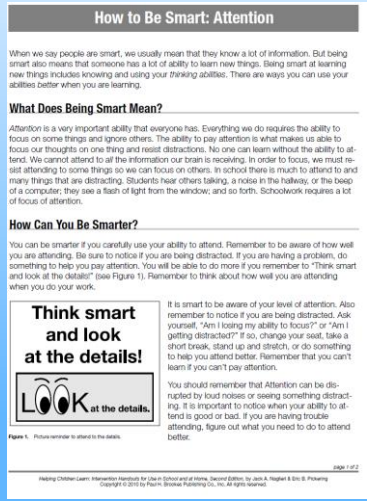

How to Be Smart: Attention

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.

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.

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.

Figure 1. Picture reminder to attend to the details.

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Simultaneous and Successive

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.

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.

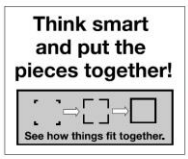


Figure 1. Picture for remembering to see the big picture.

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-

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.

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!

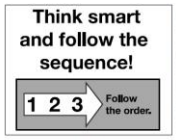


Figure 1. Picture for remembering to follow the sequence.

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!

conclusions

Inform Teacher and Parents

Planning Explained

Planning is a mental process by which the individual determines, selects, applies, and evaluates solutions to problems. This includes 1) selecting relevant information in the task, 2) selecting relevant prior knowledge, 3) using a strategy to approach a task, 4) monitoring progress, and 5) developing new strategies when necessary.

Example of Planning in the Classroom

Figure 1 shows a classroom activity that involves Planning. A common task for children is learning to spell words correctly. Teachers often give students spelling tests on specific lists of words. There are many ways for a child to memorize a spelling list. In this example, the child is encouraged to use a plan or method to learn to spell a list of words. Writing the list in alphabetical order, making flash cards, writing the words in sentences, writing the list every day, and simply reading over the list are a few ways children may learn words. Some of these plans are better for some children than other plans. Selecting one of these methods, applying it, seeing if it works, and changing it if it does not is good planning. A child who plans how to do a task and monitors how well the strategy works is likely to be more successful than a child who does a task without a plan.

Figure 1. An example of a classroom activity that requires Planning processing.

Planning describes several kinds of things:

- Making decisions about how to do things
- Evaluating the environment to determine how a problem or task could be solved
- Developing, selecting, evaluating, and using plans or strategies to solve problems
- Modifying plans or strategies to be more efficient
- Determining when the task has been completed appropriately
- Controlling behavior, impulses, and mental activity
- Defining a problem (the need for a plan) and selecting and applying a plan to solve a problem (completing a task)

There are several classroom problems related to Planning.

- Disorganized completion of assignments
- Failure to switch strategies according to the demands of schoolwork
- Failure to correct misinterpretation of what is read
- Inconsistent application of spelling or math rules when solving problems

Teaching Students About Planning

How Learning Depends on Planning Ability

The purpose of education is certainly to provide students with knowledge and skills, but researchers have found that children also need to learn how to learn. To achieve that goal, we must teach students to evaluate, apply solutions, self-monitor, and self-correct—in short, to plan their work and use plans to solve all types of problems. When we teach our students to become strategic, self-reliant, reflective, and flexible learners, we are teaching use of a method called *Cognitive Strategy Instruction* (Scheid, 1993), and this is an effective method.

When reading, and especially when obtaining meaning from text, the student must plan an approach to examining the information that is provided. This involves applying strategies to separate the important from the less important part of the text, concentrate on the details, self-monitor, and self-correct as needed. Students who are good at writing organize their goals before beginning and reflect and revise during and following production of the text. When doing math, students who are successful evaluate the problem, choose which method to use to solve it, evaluate the success of that method, change methods if necessary, and check the final answer carefully. This is also sometimes referred to as metacognition, problem solving, strategic behavior, or a self-reliant learning style. When we use cognitive strategy instruction, we are teaching students to think about what they are doing so that they can be more successful.

Importantly, these descriptions of how to learn, and the cognitive strategy instruction approach in general, are descriptions of the behaviors associated with the cognitive processing ability called *Planning* in this book (see the Planning Explained handout, p. 55). In order to help students be more successful, we must teach them to be more planful.

How to Teach Planning

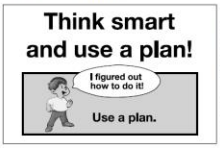


Figure 1. A drawing that helps students remember to use a plan.

The first step in teaching children to become strategic, self-reliant, reflective, and flexible learners is to tell them what a plan is and give them an easy way to remember to use a plan. In Figure 1 (which also appears in the PASS poster on the CD), we provide a fast and simple message: "Think smart and use a plan!" We should provide cognitive strategies in specific academic areas, such as decoding, reading comprehension, vocabulary, spelling, writing, math problem solving, science, and so forth, so that we

conclusions

Presentation Outline

- **PASS neurocognitive approach to learning**
  - **Separate thinking from knowing**
- **PASS Strengths and Weaknesses**
- **Getting students to Think Smart!**
  - **Step 1 – inform the examinee**
  - **Step 2 – inform teachers and parents**
- **Case Studies**
- Conclusions

PASS and Achievement

- You can align any achievement test results with PASS
  - To do so carefully examine "HOW THE STUDENT HAS TO THINK" when doing the academic test item and categorize it by PASS
    - Did the student have to SEE the big picture (Simultaneous), follow a sequence (Successive), focus on one part of the task and resist distractions (Attention), or use a strategy to solve the problem (Planning), OR SOME COMBINATION of PASS

Pair CAS2 with Far?

- Naglieri and Feifer (2017) suggest that the CAS2 and Far align given their similar neuropsychological foundation

PASS and the Far

Index	Subtest	PASS Process
Phonological Index (PI)	Phonemic Awareness (PA)	Successive
	Nonsense Word Decoding (NWD)	Successive
	Isolated Word Reading Fluency (ISO)	Successive/Simultaneous
	Oral Reading Fluency (ORF)	Successive/Simultaneous
	Positioning Sounds (PS)	Successive
Fluency Index (FI)	Rapid Automatic Naming (RAN)	Simultaneous
	Verbal Fluency (VF)	Planning
	Visual Perception (VP)	Attention
	Orthographical Processing (OP)	Simultaneous/Attention
	Irregular Word Reading Fluency (IRR)	Simultaneous
Comprehension Index (CI)	Semantic Concepts (SC)	Simultaneous/Planning
	Word Recall (WR)	Attention/Planning
	Print Knowledge (PK)	Attention
	Morphological Processing (MP)	Successive
	Silent Reading Fluency (SRF-C)	Simultaneous/Planning/Attention

Feifer Assessment of Reading

- A neurodevelopmental assessment of reading
- Pre-K to College (Ages 4-21)
- 15 subtests in complete battery
- Diagnoses 4 subtypes of reading disorders
- Total Far index score and 4 Reading index scores

Four Subtypes of Reading Disorders

1. **Dysphonetic Dyslexia** – difficulty sounding out words in a phonological manner.
2. **Surface Dyslexia** – difficulty with the rapid and automatic recognition of words in print.
3. **Mixed Dyslexia** – multiple reading deficits characterized by impaired phonological and orthographic processing skills. Most severe form of dyslexia.
4. **Comprehension Deficits** – mechanical side of reading is fine but difficulty persists deriving meaning from print

SUCCESSIVE PROCESSING AND READING DECODING

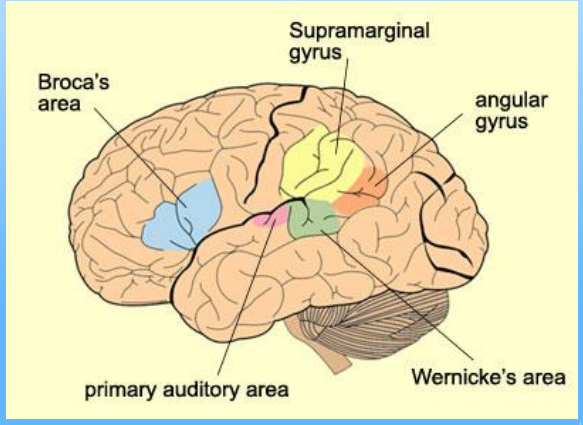
CAS-2 Successive Processing & Reading Decoding

- **Successive** – the ability to put information into a serial order or particular sequence.

- **Successive Processing & Reading** -the ability to sequence and stitch multiple sounds together to identify a word in print.

Successive Processing & Reading Decoding

Supramarginal Gyrus – the ability to stitch together sounds in a sequential manner.



Jacob - 6th grade

Presenting Concerns: Reading, Math Word Problems, Text Anxiety

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

Jacob 6th grade

CAS-2	STANDARD SCORE	RANGE	PERCENTILE RANK
Planning	**92**	**Average**	**30%**
Attention	**98**	**Average**	**45%**
Simultaneous	**90**	**Average**	**25%**
Successive	**72**	**Very Low**	**3%**
CAS-2 Full Scale SCORE	**86**	**Below Average**	**18%**

conclusions

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Jacob 6th grade

FAR index	Standard score	%tile	Category
Phonological Index	**75**	**5%**	**Moderately Below Average**
Fluency Index	92	30%	Average
Mixed Index	81	10%	Below Average
Comprehension Index	97	42%	Average
FAR Total Index	84	14%	Below Average

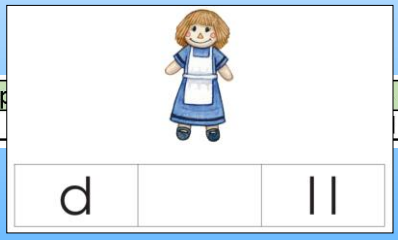
KEY INTERPRETATION	Score	Percentile	Descriptor
Nonsense Word Decoding – requires the student to decode a series of nonsense words presented in order of increasing difficulty .	71	3%	Moderately Below Average
Irregular Word Reading Fluency – the student reads a list of phonologically irregular words arranged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

conclusions

How to Pair the Far with CAS2

➢**FAR :** The **Phonological Index** is a measure of decoding skills and word reading based upon phonological processing tests *(i.e. Phonemic Awareness or Positioning Sounds).*

Item	Correct resp
ad : van : tage	advantage

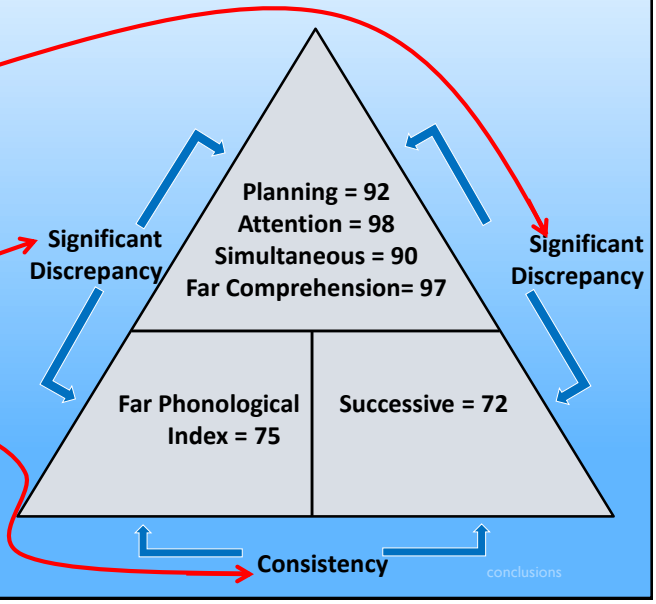


Poor Successive (CAS-2) + Poor Phonological Index (FAR) = SLD in Reading Decoding

conclusions

Discrepancy Consistency for Jacob

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



conclusions

Successive Processing Interventions

- Alphabetic Phonics (Orton-Gillingham)
- Recipe for Reading
- SRA Corrective Reading
- Earobics II
- Lindamood Seeing Stars
- LEXIA
- Horizons
- Read Well
- DISTAR (*Reading Mastery)*
- Fast Forword II
- Earobics I
- Phono-Graphix
- Saxon Phonics
- Success for All
- Ladders to Literacy
- Fundations
- Road to the Code
- Scott Foresman Early Intervention Reading

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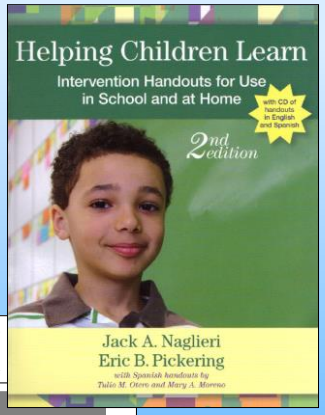
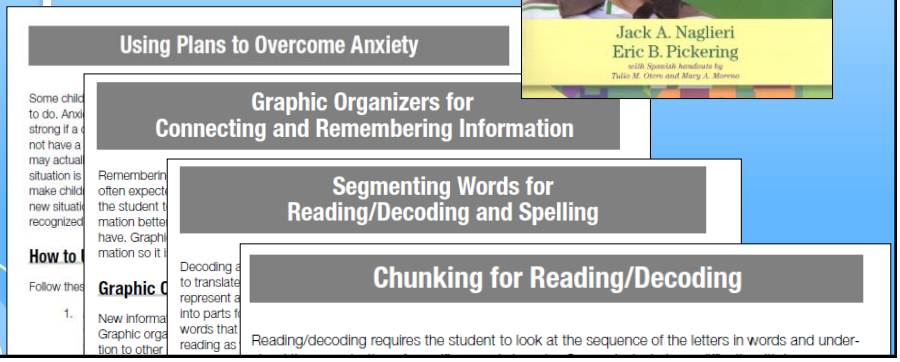
Interventions

- Helping Children Learn Intervention Handouts for Use in School and at Home, *Second Edition (*Naglieri & Pickering, 2011)
- Spanish handouts by Tulio Otero, Ph.D., & Mary Moreno, Ph.D.





SUCCESSIVE PROCESSING UNDERLIES READING AND MATH

conclusions

Successive Processing & Learning

- Successive processing is used to work with information arranged in a specific order
  - the formation of sounds, letter, words and movements in a specific order
  - This is necessary for the recall of information in order as well as phonological analysis and the syntax of language
  - Deficits with successive processing are the basis of with early reading problems, as it requires a child to learn sounds in a sequential order.

conclusions

Successive Processing & Reading

- Many academic tasks demand Successive processing, such as
  - initial reading decoding of unfamiliar words, spelling, and sequencing of words to make a sentence.
  - Successive processing is critical when reading very confusable words and careful attention to the pronunciation of sounds is needed
  - Tests of phonological skills, reading decoding and spelling all demand considerable successive processing.

conclusions

Successive Processing & Math

- Many math tasks demand Successive processing for…
  - counting, memorizing math facts, ordering numbers, comprehending numeric quantities, and manipulating symbols in a sequential fashion (Feifer, 2016).
- Note: nearly two-thirds of children with a math learning disability also have a reading disability due in part, to the Successive processing demands of both tasks (Ashkenazi et al., 2013).

conclusions

Successive Processing & Peter

- Peter is currently in 5th grade and remains below grade level in reading and mathematics. He was referred for an updated assessment using a processing strengths and weaknesses approach to determine how Peter learns, in order to identify more specific, and effective, intervention strategies.

conclusions

Successive Processing & Peter

- Peter was initially referred for a school psychological evaluation while in 3rd grade.
  - The results: no significant ability achievement discrepancy, both were in *Average* range. Furthermore, there were no attention or behavioral concerns reported as well.
  - He did not qualify for special education services, and the evaluation offered few interventions or classroom accommodations to assist with learning.

conclusions

Successive Processing & Peter

- Peter is currently in 5th grade and remains below grade level in reading and mathematics. He was referred for an updated assessment using a processing strengths and weaknesses approach to determine how Peter learns, in order to identify more specific, and effective, intervention strategies.

conclusions

Successive Processing & Peter

Table 8. Peter's PASS and Full Scale Scores from the Cognitive Assessment System – Second Edition.

Cognitive Assessment System - 2			Difference from PASS Mean of:	Significantly Different (.05) from PASS Mean?	Strength (S) or Weakness (W)
PASS Scales	Standard Score	Percentile	92.2		
Planning	94	34	1.8	no	
Attention	94	34	1.8	no	
Simultaneous	102	55	9.8	yes	
Successive	79	8	-13.2	yes	W
CAS-2 Full Scale	92	30			

conclusions

Successive Processing & Peter

Peter had difficulty within the FAR Phonological Index, which required him to use Successive processing to chunk together individual sounds or phonemes to identify words. He relied upon his stronger Simultaneous processing (see good score on the Fluency Index) to identify phonologically irregular words (i.e. yacht, debt, etc...), but, because of poor Successive processing he had more difficulty identifying words that were decodable.

Table 10. Peter's Scores on the Feifer Assessment of Reading

FAR index	Standard score (95% CI)	Percentile	Qualitative descriptor
Phonological Index	79(+/-3)	8%	Moderately Below Average
Fluency Index	92 (+/-8)	30%	Average
Mixed Index	85 (+/-4)	16%	Below Average
Comprehension Index	90 (±10)	25%	Average
FAR Total Index	84 (±4)	14%	Below Average

Successive Processing & Peter

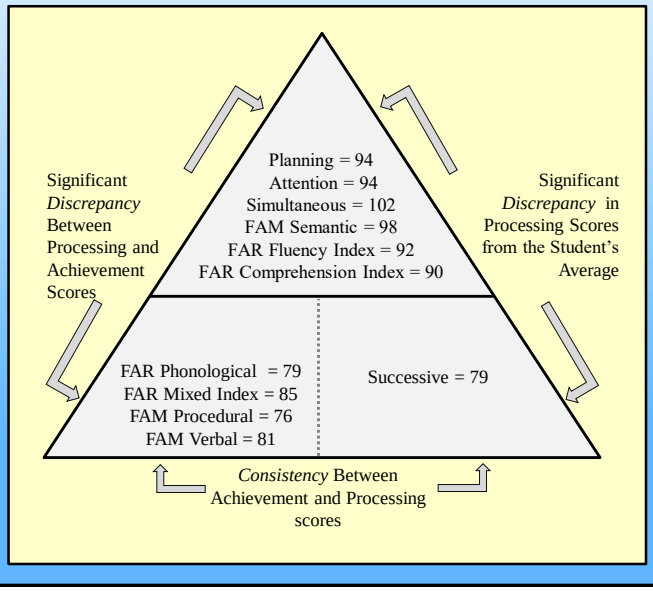
Peter's Procedural Index, which involves a collection of sequence-based skills such as skip counting forward and backward from various points on a number line, as well as recognizing patterns and sequences among number relationships

Table 9. Peter's Scores on the Feifer Assessment of Math

FAM Index	Standard score (95% CI)	Percentile	Qualitative Descriptor
Procedural Index	76(+/-8)	5%	Moderately Below Average
Verbal Index	81 (+/-8)	10%	Below Average
Semantic Index	98 (+/-5)	45%	Average
FAM TOTAL INDEX	86 (±8)	18%	Below Average

conclusions

Discrepancy / Consistency Method for Peter



Interventions for Peter

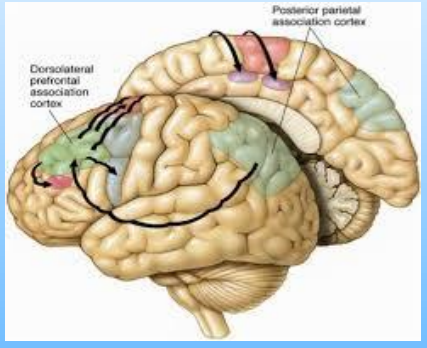
- Specific strategies to assist Peter in math may include learning how to chunk information, practice on number line fluency skills, playing math games such as the 24 game to develop greater procedural knowledge when problem solving, and utilizing mnemonic strategies to remember longer mathematical algorithms.

conclusions

PLANNING AND READING COMPREHENSION

CAS-2 Planning & Reading Comprehension

➢**Planning** – provides the ability to apply knowledge, use a strategy, and self-monitor performance while working toward a solution.



➢**Planning & Reading** - read with a specific question or purpose in mind when seeking specific information. In other words, plan a strategy!!

How to Pair Far & CAS2

- **CAS2 -** determine if there is a cognitive processing weakness (i.e. **Planning**) and whether that particular weakness directly impacts the academic skill in question (Reading Comprehension) on the FAR.

- **Far:** The **Silent Reading Fluency** has individual stories followed by sets of questions. The story is removed, and followed by 4 literal and 4 inferential questions. Pair with **Word Recall to** determine the extent of poor planning at both the word and text level.

Poor Planning (CAS-2) + Poor Comprehension Index = SLD in Reading Comprehension

Far Word Recall: Word Planning

❑ PK–Grade 2

Item	
1.	chain
2.	drum
3.	pepper
4.	wheel
5.	guitar
6.	celery
7.	brake
8.	trumpet
9.	tomato

Trial 2: Bicycle words			Intrusions
chain	❑	R	
wheel	❑	R	
brake	❑	R	
3rd+ handlebars	❑	R	

Trial 2: Musical instruments			Intrusions
drum	❑	R	
guitar	❑	R	
trumpet	❑	R	
3rd+ piano	❑	R	

❑ Grades 3+

Item	
1.	chain
2.	drum
3.	pepper
4.	wheel
5.	guitar
6.	celery
7.	brake
8.	trumpet
9.	tomato
10.	handlebars
11.	piano
12.	carrot

Trial 2: Fruits and vegetables			Intrusions
pepper	❑	R	
celery	❑	R	
tomato	❑	R	
3rd+ carrot	❑	R	

Trial 2 subtotals			
	Number correct	Repetitions	Intrusions

To calculate the Word Recall total, transfer the Trial 1 and Trial 2 subtotals to the appropriate spaces below. Sum the number correct subtotals and record this value in the space provided.

Trial 1 subtotals			
Trial 2 subtotals	+		
Word Recall (WR) total	=	Repetitions	Intrusions
	Number correct		

Silent Reading Fluency: Text Planning

- 2 passages and sets of comprehension questions based on grade level; 60 seconds to read each passage
  - Story is removed before asking questions.
  - 4 questions are literal from story (Text Attention)
  - 4 questions are inferential from story (Text Planning)

conclusions

Rowan 4th grade: ADHD & Reading

CAS-2	SCORE
Planning: the ability to apply a strategy, and self-monitor and self- correct performance while working toward a solution.	77
Attention: the ability to selectively focus on a stimulus while inhibiting responses from competing stimuli.	85
Simultaneous Processing- is the ability to reason and problem solve by integrating separate elements into a conceptual whole, and often requires strong visual-spatial problem solving skills.	105
Successive Processing- is the ability to put information into a serial order or particular sequence.	100

conclusions

Rowan 4th grade: ADHD & Reading

FAR COMPREHENSION INDEX	Score	Descriptor
Semantic Concepts– a multiple choice test requiring the student to select the correct antonym or synonym of a target word.	95	Average
Word Recall – requires the student to repeat back a list of words over a series of two trials. The second trial requires the student to recall a word from a selected list.	82	Below Average
Morphological Processing – a multiple choice test requiring students to choose the correct prefix, suffix, or stem that best completes an incomplete target word.	90	Average
Silent Reading Fluency – requires the student to silently read a passage, and then answer a series of literal and inferential questions about the story. Reading rate is also recorded as well.	75	Moderately Below Average
FAR COMPREHENSION INDEX	**84+/-8**	**Below Average**
WIAT III Reading Comprehension	96	Average

conclusions

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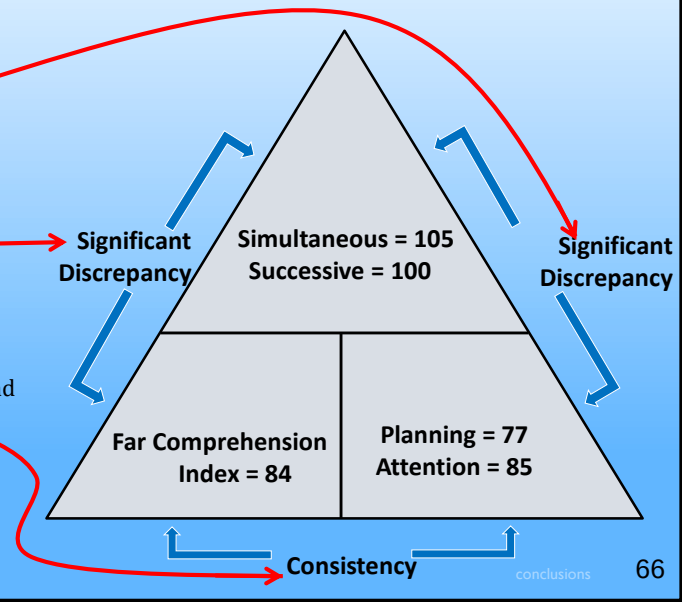
Discrepancy Consistency for Rowan

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



conclusions

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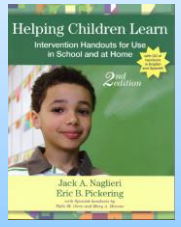
Planning Interventions

1. **Directional Questions** – ask questions at the beginning of the text instead of the end.
2. **Multiple Exposures**– encourage students to skim the material prior to reading, with emphasis on chapter and text headings.
3. **SOAR to SUCCESS** - A comprehension program for grades 3-6 to help students develop a reading plan.
   - 30-35 minute lessons…18 weeks.
   - 4 Key Strategies: Summarize, Clarify, Question, Predict

Planning Interventions

4. **Story Maps** – pre-reading activity where graphic organizers are used to outline and organize the information.
5. **Planning Facilitation** – encourages students to use strategies in reading (and math)

These interventions along with reproducible teacher, parent and student *handouts* are included in **Helping Children Learn**



Planning Intervention for Reading Comprehension

- The 45 4th graders reading comprehension test pre & post
- Three groups
  - Planning WK
  - Successive WK
  - No WK

Journal of Psychoeducational Assessment
2003, *21*, 282-289

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

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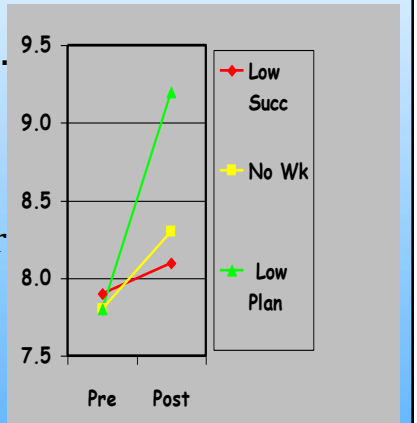
George Mason University

Michelle Grimditch, Ashley McAndrews, Jane Eubanks
Kyrene School District, Tempe, Arizona

The purpose of this study was to evaluate whether instruction designed to facilitate planning would have differential benefit on reading comprehension depending on the specific Planning, Attention, Simultaneous, and Successive (PASS) cognitive characteristics of each child. A sample of 45 fourth-grade general education children was sorted into three groups based on each PASS scale profile from the Cognitive Assessment System (CAS). The groups did not differ by CAS Full Scale standard score, chronological age, gender, or pretest reading comprehension scores. After each child's pretest reading comprehension instructional level was determined, a cognitive strategy instruction intervention was conducted. The children completed a reading comprehension posttest at their respective instructional levels after the intervention. Results showed that children with a Planning weakness ($n = 13$) benefited substantially (effect size of 1.52) from the instruction designed to facilitate planning. Children with no weakness ($n = 21$; effect size = .52) or a Successive weakness ($n = 11$; effect size of .06) did not benefit as much. These results support previous research suggesting that PASS profiles are relevant to instruction.

Planning Facilitation & Reading

- These probes were used …
  - How did you complete the reading questions?
  - Why did you do it that way?
  - What can be done to get mor correct?
  - What did you notice about the questions?
  - What will you do next time?



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SAGE

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

Jackie S. Iseman[1] and Jack A. Naglieri[1]

Abstract

The authors examined the effectiveness of cognitive strategy instruction
Successive) given by special education teachers to students with ADHD
experimental group were exposed to a brief cognitive strategy instructi
development and application of effective planning for mathematical comp
standard math instruction. Standardized tests of cognitive processes a
students completed math worksheets throughout the experimental ph
Johnson Tests of Achievement, Third Edition, Math Fluency and *Wechsle*
Numerical Operations) were administered pre- and postintervention, a
follow-up. Large pre–post effect sizes were found for students in the exp
math worksheets (0.85 and 0.26), Math Fluency (1.17 and 0.09), and Nu
At 1 year follow-up, the experimental group continued to outperform t
students with ADHD evidenced greater improvement in math worksh
(which measured the skill of generalizing learned strategies to other sin
when provided the PASS-based cognitive strategy instruction.

Design of the Study

Experimental and Comparison Groups

7 worksheets with Normal Instruction

Experimental Group

19 worksheets with Planning Facilitation

Comparison Group

19 worksheets with Normal Instruction

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

Planning (Metacognitive) Strategy Instruction

- 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?
  - What other strategies will you use next time?

Student Plans

- "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 do them (the algebra) by figuring out what I can put in for X to make the problem work."
- "I did all the problems in the brain-dead zone first."
- "I try not to fall asleep"

Student Strategies

Table 3. Students' Comments During Planning Facilitation Sessions

Goals
- "My goal was to do all of the easy problems on every page first, then do the others."
- "To get as many correct as I can."
- "To get as many right as quickly as possible."
- "To take time and make sure I get them correct."

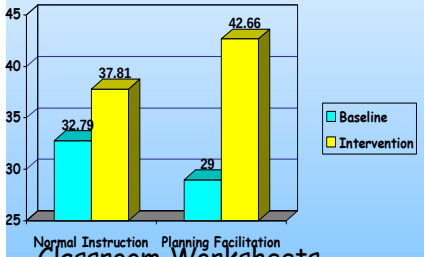
Starting place
- "I started on the first one."
- "I skipped around."
- "I do the easy ones first."
- "I look at the type of problem and the number of steps and decide which problems to do first."

Overall plan
- "I did all the easy problems on a page and went onto the next one."
- "I do all the addition first, then the easy minus, and then I move onto the harder ones."
- "I do the problems I know, then I check my work."

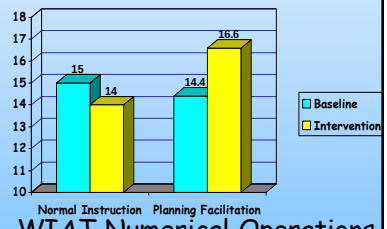
Specific strategies
- "I simplify fractions first."
- "Skip the longer multiplication questions."
- "The problems that have lots of steps take more time, so I skip them."
- "I do them [the algebra] by figuring out what I can put in for X to make the problem work."
- "I draw lines so I don't get my columns confused [on the multiplication]."
- "I stopped drawing lines because it slowed me down."
- "If a problem is taking a long time I skip it and come back to it if I have time."
- "I did the ones that take the least time."
- "Remember that anything times 0 is 0."

Noticing patterns in the worksheets
- "I did all the problems in the brain-dead zone first."
- "I started in the middle of the page, the problems on top take longer."
- "Next time I'll skip the hard multiplication at the top of the first page."

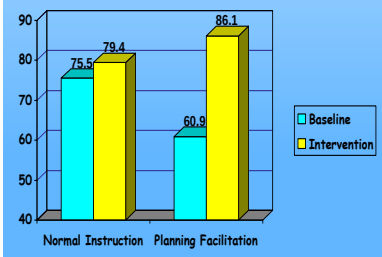
Worksheet Means and Effect Sizes for the Students with ADHD



Classroom Worksheets



WIAT Numerical Operations

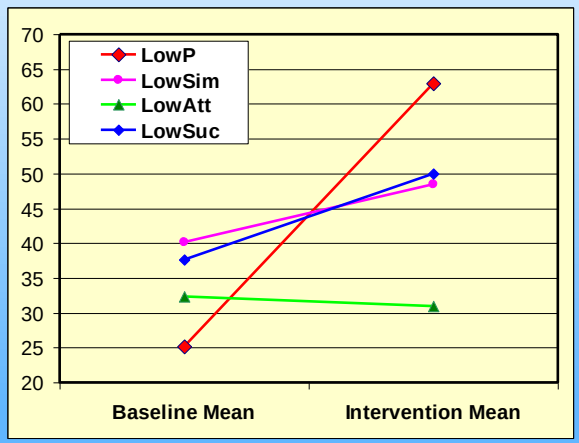


WJ Math Fluency

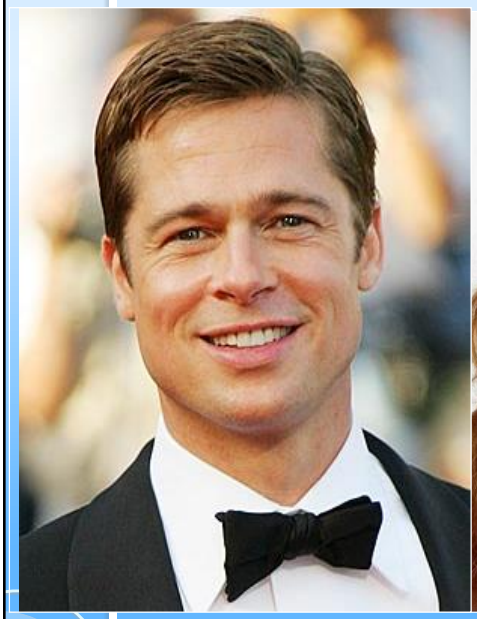
At 1-year follow-up, 27 of the students were retested on the WJ-III ACH Math Fluency subtest as part of the school's typical yearly evaluation of students. This group included 14 students from the comparison group and 13 students from the experimental group. The results indicated that the improvement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

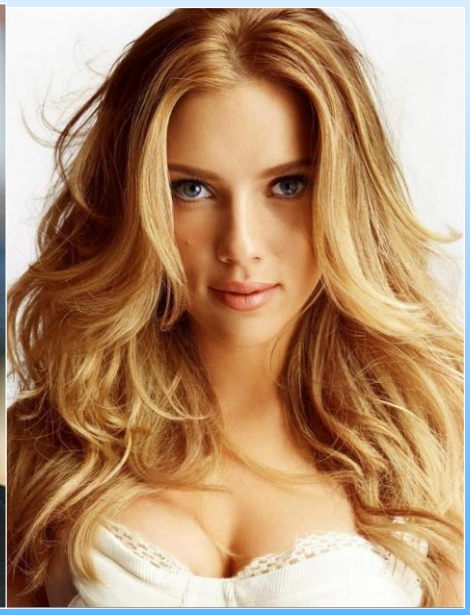
Iseman (2005)

- Baseline Intervention means by PASS profile
- Different response to the same intervention



Time to think and talk…



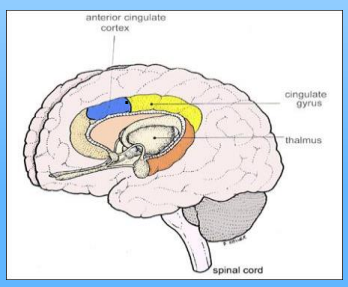


CAS-2 Attention & Reading Accuracy

- **Attention** – the ability to selectively focus on a stimulus while inhibiting responses from competing stimuli.
- **Attention & Reading** -the ability to stay focused on the text for prolonged periods of time and resist distractions.
  - Allows the reader to become engaged with the text
- **Attentive Reading** - text perception and accurate word identification skills.

Attention and the Brain: Anterior Cingulate Cortex (Goldberg, 2013)

- **Anterior Cingulate Cortex** – allows us to shift our focus from the outside world of objects and events toward the inside world of thoughts and ideas (*self awareness).*
- Linked to effortful control, task motivation, top-down attention, and cognitive flexibility



Far Visual Perception: Text Attention

One 30-second Trial; Letters (PK-2nd) or Words (3rd +)

Letters

b j y w a v ɔ q
t q t ə x n i o

Words

shady tired telephone aɛsist ɔalendar

Silent Reading Fluency: Text Attention

- 2 passages and sets of comprehension questions based on grade level; 60 seconds to read each passage
  - Story is removed before asking questions.
  - 4 questions are literal from story **(Text Attention)**
  - 4 questions are inferential **(Text Abstraction)**

Text Attention Interventions

1. Active Participation – encourage active, not passive reading, by having children take notes or putting an asterisk next to important information. Also, multiple colors for highlighting.

2. Medication Management – ADHD students in particular can better focus and sustain their attention if appropriately medicated.

3. Classroom Discussions – introduce new topic areas with a discussion aimed at capturing a student's interest, providing them with background knowledge, and engaging an emotional connection with the text.

4. Read, Read, Read!!

SIMULTANEOUS PROCESSING AND READING COMPREHENSION

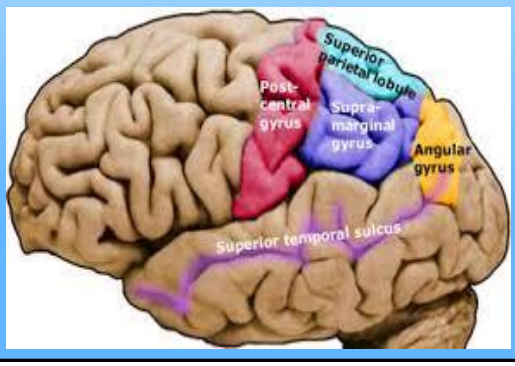
CAS-2 Simultaneous Processing & Reading Fluency

Simultaneous Processing– the ability to integrate separate elements into a conceptual whole, and often requires visual-spatial problem solving skills.

Simultaneous & Reading -the ability to automatically and instantaneously recognize words in print without sounding out each individual phoneme. An extremely important skill in developing reading fluency.

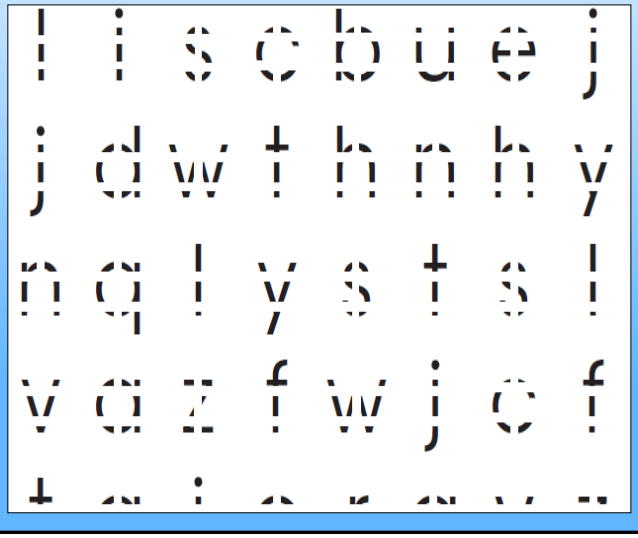
Simultaneous Processing and Reading Fluency

Angular Gyrus– the ability to ascribe meaning to spatial arrays and symbols. Educators often refer to this as **orthographic processing**.



Rapid Automatic Naming: Simultaneous Perception

Far Rapid Naming of Stencils



Text Orthography: Simultaneous Processing

Orthographical Processing

The student chooses which letters appeared in presented word

Initial Presentation for 1 sec

epiphany

Response Options

eph phi pip iny

Irregular Word Fluency: Simultaneous Processing

Far Irregular Word Reading Fluency:

(60 seconds)

yacht
debt
answer
seizure
gnome
malign
conscience
plaque

How to Pair the Far with CAS2

- **CAS-2:** Determine if the there is a cognitive processing weakness in **Simultaneous** and a weakness in reading speed and accuracy on the Far.

- **Far :** The **Fluency Index** is a measure of reading efficiency based upon both orthographical processing tests, rapid automatic naming tasks, and reading irregular words.

Poor Simultaneous (CAS-2) + Poor Fluency Index(FAR) = SLD in Reading Fluency

Nelson 4th grade

Presenting Concerns: Reading, Writing, Math Fluency

WISCV Domains	COMPOSITE SCORE	RANGE	PERCENTILE RANK
Verbal Comprehension Index	103	Average	58%
Visual Spatial Index	84	Below Average	14%
Fluid Reasoning Index	79	Very Low	8%
Working Memory Index	91	Average	27%
Processing Speed Index	82	Below Average	12%
FULL SCALE SCORE	81	Below Average	10%
WIAT III Reading	80	Below Average	9%
WIAT III Math	90	Average	25%
WIAT III Writing	86	Below Average	18%

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Nelson 4th grade

CAS-2	Standard SCORE	RANGE	%tile RANK
Planning	94	Average	35%
Attention	98	Average	45%
Simultaneous Processing	74	Very Low	4%
Successive Processing	90	Average	25%
CAS-2 Full Scale SCORE	89	Below Average	23%

conclusions

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Nelson 4th grade

FAR index	Standard score (95% CI)	Percentile	Qualitative descriptor
Phonological Index	90(+/-5)	25%	Average
Fluency Index	73 (+/-7)	3%	Moderately Below Average
Mixed Index	81 (+/-5)	10%	Below Average
Comprehension Index	97 (±8)	42%	Average
FAR Total Index	**84 (±5)**	**14%**	**Below Average**

conclusions

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Nelson 4th grade

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

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

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

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

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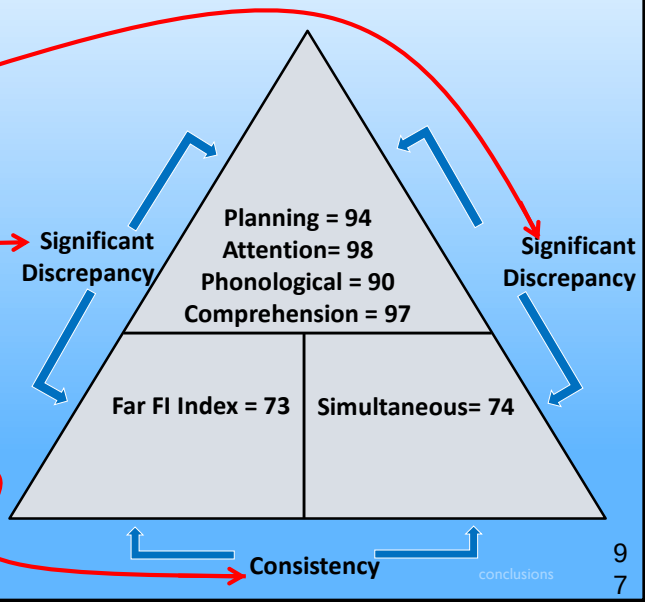
Discrepancy Consistency for Nelson

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



conclusions

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Fluency Intervention: Read Naturally

- A fluency based program designed to develop speed, accuracy, and proper expression.
- Designed to be used 3 times per week…30 minutes, mainly for students between 2nd (51wpm) though 8th (133 wpm) grades.
- Each level of the program has 24 non-fiction stories.
  a) Student placed in level and goal is set.
  b) Cold read for one minute graphing wpm and identifying difficult words.
  c) Read with tape three times consecutively.
  d) Hot read is attempted.
  e) Comprehension questions involve main idea, details, vocabulary, inferences, & short answers.

conclusions

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WHY PASS AS MEASURED BYT CAS2?

conclusions

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Hale, Naglieri, Kaufman, & Kavale (2004)

- Tests that we specifically developed to measure basic psychological processes should be used
  - The K-ABC II (Kaufman & Kaufman, 2004)
  - The CAS2 (Naglieri, Das & Goldstein, 2014)
- These and other tests, will be evaluated based on two essential criteria included in IDEA:
  - Non-discriminatory Assessment
  - Validity for SLD eligibility determination

conclusions

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IDEA 2004

"(3) ADDITIONAL REQUIREMENTS.—Each local educational agency shall ensure that—

"(A) assessments and other evaluation materials used to assess a child under this section—

"(i) are selected and administered so as not to be discriminatory on a racial or cultural basis;

"(ii) are provided and administered in the language and form most likely to yield accurate information on what the child knows and can do academically, developmentally, and functionally, unless it is not feasible to so provide or administer;

"(iii) are used for purposes for which the assessments or measures are valid and reliable;

"(iv) are administered by trained and knowledgeable personnel; and

"(v) are administered in accordance with any instructions provided by the producer of such assessments;

"(B) the child is assessed in all areas of suspected disability;

"(C) assessment tools and strategies that provide relevant information that directly assists persons in deter-

non discriminatory assessments

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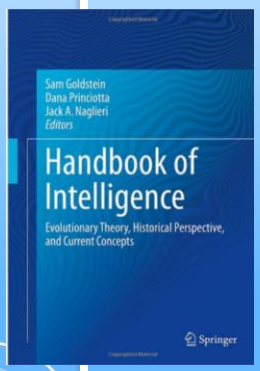
Evolution of IQ (Goldstein, Principotta & Naglieri, 2015)



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

20

Jack A. Naglieri

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

Context

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

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

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

conclusions

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Race by test

(Naglieri, 2015)

psychological processes measured by KABC and CAS are the more fair than traditional tests

Table 20.1 Mean score differences in standard scores by race on traditional IQ and second-generation intelligence tests

Test	Difference
Traditional	
SB-IV (matched)	12.6
WISC-IV (normative sample)	11.5
WJ-III (normative sample)	10.9
WISC-IV (matched)	10.0
Second generation	
KABC (normative sample)	7.0
KABC (matched)	6.1
KABC-2 (matched)	5.0
CAS2 (normative sample)	6.3
CAS (demographic controls)	4.8
CAS2 (demographic controls)	4.3

Naglieri, Rojahn, Matto (2007)

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

Available online at www.sciencedirect.com
ScienceDirect
ELSEVIER
Intelligence 35 (2007) 568–579
INTELLIGENCE

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

Jack A. Naglieri [a,*], Johannes Rojahn [a], Holly C. Matto [b]

[a] Center for Cognitive Development, George Mason University, Department of Psychology, MS# 2C6, United States
[b] Virginia Commonwealth, United States

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

Abstract

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

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PASS Score by Language

CAS Full Scale = 84.6 in English and 87.6 in 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 performa on the Planning, Attention, Simulta sured by English and Spanish ver (CAS; Naglieri & Das, 1997a). The on both English and Spanish versi CAS, the bilingual children earned regardless of the language used dur ences were noted between the means Simultaneous and Successive proces were similar. Specific subtests with were found to contribute to the dif versions of the CAS. Comparisons ness on both versions of the CAS sistently despite the language differe

CAS Full Scale = 86.4 in English and 87.1 in Spanish

APPLIED NEUROPSYCHOLOGY: CHILD, 0: 1-9, 2012

ISSN: 2162-2965 print/2162-2973 online
DOI: 10.1080/21622965.2017.670547

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

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CAS in Italy

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

Jack A. Naglieri
University of Virginia and Devereux Center for Resilient Children
Stefano Taddei
University of Florence
Kevin Williams
Multi-Health Services, Toronto, Ontario, Canada

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

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

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WJ-III and ELL Hispanic Students

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

11 point mean score difference in GAI

As English skills go down so does the GAI

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	100	15	−4.77	−2.96*	−0.38
Visual-Auditory Learning	95.62	14.56	100	15	−4.38	−2.35*	−0.30
Sound Blending	97.82	11.57	100	15	−2.18	−1.47	−0.19
Visual Matching	98.93	9.80	100	15	−1.07	−0.85	−0.11
Spatial Relations	99.18	8.45	100	15	−0.82	−0.758	−0.10

*$p < .05$. **$p < .01$. ***$p < .001$.

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*	*SD*	Difference	*t*	*d*
Beginner	71.75	3.95	100	15	−28.25	−14.31*	−7.15
Intermediate	82.29	8.66	100	15	−17.71	−7.65*	−2.05
Advanced	89.55	9.17	100	15	−10.45	−10.45*	−1.14
Proficient	101	9.23	100	15	1.00	.405	0.11

*$p < .001$.

108 Notes by Jack A. Naglieri, Ph.D. jnaglieri@gmail.com

Illinois School District U-46

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

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

Plaintiffs,

v.

BOARD OF EDUCATION FOR ILLINOIS SCHOOL DISTRICT U-46,

Defendant.

No. 05 C 0760

Judge Robert W. Gettleman

Illinois School District U-46

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

On July 11, 2013, Judge Robert Gettlemen issued a decision holding that District U-46 *intentionally* discriminated against Hispanic students specific in their gifted programming (placement), and found problems with policies and instruments

- The district relied too much on verbal and achievement tests for identification of gifted students.

conclusions

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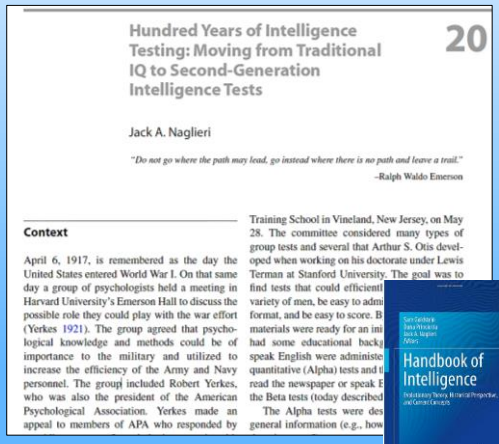
Correlations with Achievement

- **Can you take achievement out of a cognitive test?**
- The average correlations between ability and academic scores with and without ***criterion contamination***…



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

20

Jack A. Naglieri

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Context

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variety of men, be easy to adm
format, and be easy to score. B
materials were ready for an ini
had some educational backg
speak English were administe
quantitative (Alpha) tests and t
read the newspaper or speak E
the Beta tests (today described
The Alpha tests were des
general information (e.g., how

conclusions

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Correlations with Achievement

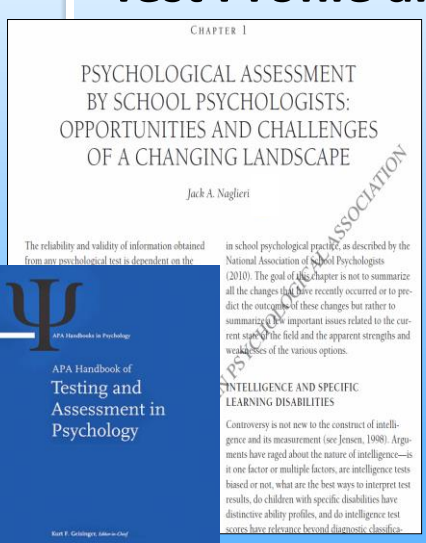
- Correlations between ability & achievement tests show the strength of measuring basic psychological processes

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

Correlations Between Ability and Achievement 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 Se
Concept Formation; Auditory Processing = Phonological processing.

Test Profile and SLD


CHAPTER 1

PSYCHOLOGICAL ASSESSMENT BY SCHOOL PSYCHOLOGISTS: OPPORTUNITIES AND CHALLENGES OF A CHANGING LANDSCAPE

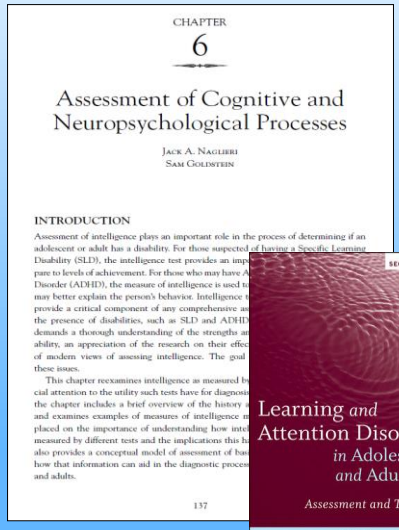
Jack A. Naglieri

The reliability and validity of information obtained from any psychological test is dependent on the

in school psychological practice, as described by the National Association of School Psychologists (2010). The goal of this chapter is not to summarize all the changes that have recently occurred or to predict the outcomes of these changes but rather to summarize a few important issues related to the current status of the field and the apparent strengths and weaknesses of the various options.

INTELLIGENCE AND SPECIFIC LEARNING DISABILITIES

Controversy is not new to the construct of intelligence and its measurement (see Jensen, 1998). Arguments have raged about the nature of intelligence—is it one factor or multiple factors, are intelligence tests biased or not, what are the best ways to interpret test results, do children with specific disabilities have distinctive ability profiles, and do intelligence test scores have relevance beyond diagnostic classifica-


CHAPTER 6

Assessment of Cognitive and Neuropsychological Processes

Jack A. Naglieri
Sam Goldstein

INTRODUCTION

Assessment of intelligence plays an important role in the process of determining if an adolescent or adult has a disability. For those suspected of having a Specific Learning Disability (SLD), the intelligence test provides an imp... pare to levels of achievement. For those who may have AD... Disorder (ADHD), the measure of intelligence is used t... may better explain the person's behavior. Intelligence t... provide a critical component of any comprehensive as... the presence of disabilities, such as SLD and ADHD... demands a thorough understanding of the strengths an... ability, an appreciation of the research on their effec... of modern views of assessing intelligence. The goal ... these issues.

This chapter reexamines intelligence as measured b... cial attention to the utility such tests have for diagnosis... the chapter includes a brief overview of the history a... and examines examples of measures of intelligence m... placed on the importance of understanding how int... measured by different tests and the implications this h... also provides a conceptual model of assessment of bas... how that information can aid in the diagnostic proces... and adults.

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Naglieri & Goldstein (2011)

GROUP PROFILES BY ABILITY TEST

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

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

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

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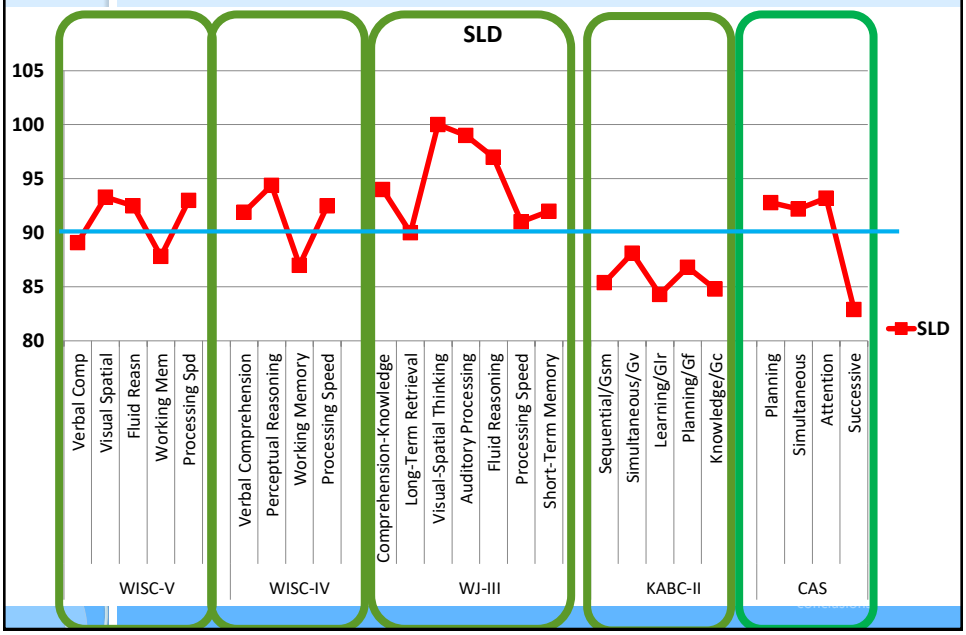
Profiles for SLD (reading decoding)



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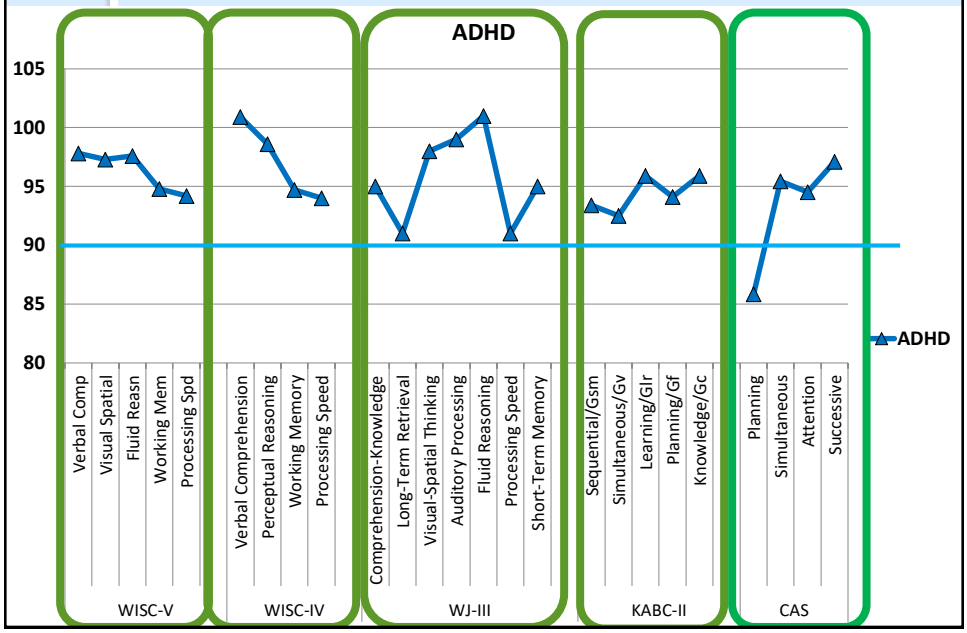
Profiles for students with ADHD



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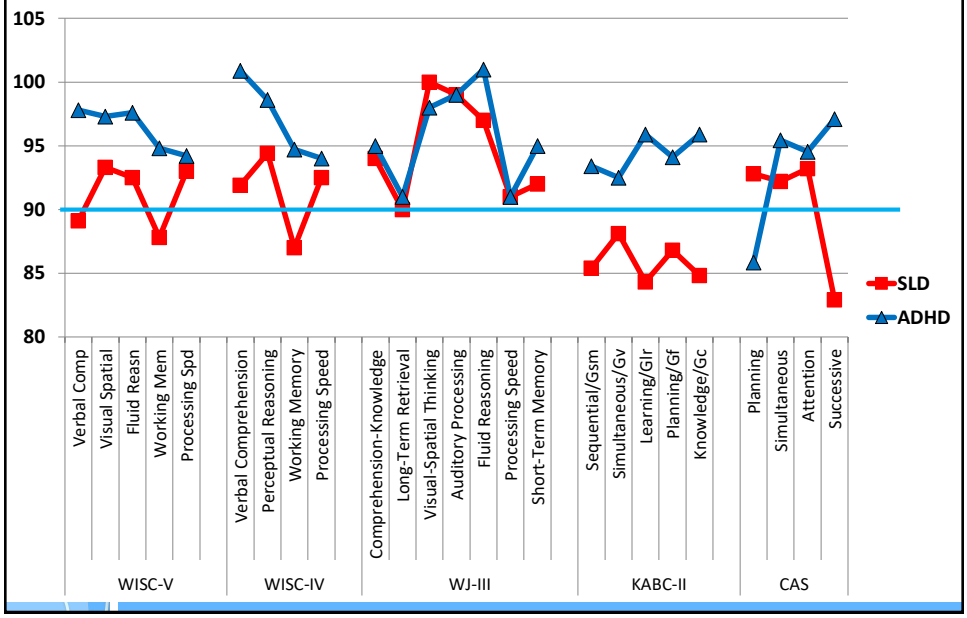
Profiles for SLD (reading decoding) & ADHD



Discrepancy/Consistency Method

- Measuring basic psychological processes is essential to address SLD as described in IDEA and state standards
- CAS2 provides a way to operationalize the measurement "basic psychological processes" -- PASS
- PASS is a neurocognitive theory of learning
- There is strong evidence that PASS scores are non-discriminatory, strongly related to academic performance, can be used to detect SLD and intervention design

Themes for the day…

It doesn't have to be so complicated

Science is more important than beliefs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ABOUT
Jack A. Naglieri, Ph.D., is Research Professor at the Curry School of Education at the University of Virginia, Senior Research Scientist at the Devereux Center for Resilient Children and Emeritus Professor of Psychology at George Mason University.
PUBLICATIONS
The author of more than 300 publications, his recent efforts include cognitive assessment, cognitive intervention, SLD determination and measurement of psychopathology and resilience.
TESTS
A comprehensive list of Jack A. Naglieri's tests such as the Naglieri Nonverbal (NNAT) and the Comprehensive Executive Function Inventory (CEFI).
RESOURCES
Download a PDF of handouts of past presentations on various topics and research by Jack A. Naglieri.