Introducing the CAS2, CAS2 Brief, and CAS2 Rating Scale: Three Ways to Measure PASS Neurocognitive Theory

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conclusions

Topical Outline

- Introduction to PASS measured by CAS2
- CAS2, CAS2-Brief and CAS2-Rating Scale
- PASS processes Revisited
  - PASS neurocognitive processes
- Why PASS and CAS?
  - IQ test Profiles, Race/Ethnic Differences, Intervention
- Interpretation of CAS2, CAS2: Brief, and CAS2: Rating Scale
  - Using CAS2 for Eligibility Determination
  - Using CAS2 for Academic Intervention

conclusions

CAS2 Development Goals

- Create a revised version of the 1997 CAS
  - CAS2 – retain the 8 and 12-subtest format, modify subtests, add scales, continue emphasis on PASS
- Create CAS2: Brief
  - Create a brief version of CAS2 (20 minutes) for ages 4 years 0 months to 18 years 11 months
- Create the CAS2: Rating scale
- All three measures are carefully normed on national samples representative of the U.S. population

CAS and CAS2

- Like the Cognitive Assessment System (CAS; Naglieri & Das, 1997), the three new versions of the CAS2 (Naglieri, Das, & Goldstein, 2014) are based on the PASS neurocognitive processing theory.
- PASS is a brain based view of the abilities we use to function in all aspects of life
- PASS can be used to define the "basic psychological processes" described in IDEA

CAS and CAS2

- CAS2, like the CAS, is NOT traditional IQ
  - E.g., Wechsler, Stanford-Binet, Woodcock-Johnson, and Differential Ability Scales which include verbal and quantitative subtests that require knowledge
    - The V, NV, Q format was **first developed in 1917 !**
- CAS and CAS2 tests do not have subtests that require the child to define words or solve math word problems – sometimes described as verbal and quantitative reasoning
- CAS and CAS2 measure ***PASS neurocognitive processes***

CAS and CAS2

- CAS and CAS2 are unique because they…
  - are based on a specific neurocognitive theory
    - The PASS constructs are based on A. R. Luria's conceptualizations of brain function
  - PASS theory and CAS and CAS2 subtests measure neruocognitive processes that underlie the acquisition of knowledge and human functioning
  - PASS scores have been shown to be sensitive to disorders in basic psychological processes related to academic success and failure
  - PASS is the best way to assess diverse populations
  - PASS scores have been show to be relevant to intervention

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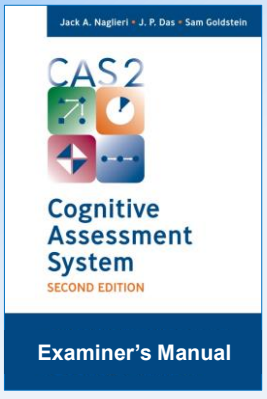
PASS Comprehensive System

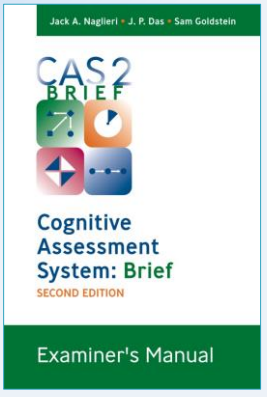
GOAL: Create a set of tools to measures PASS Theory for use across multiple settings and multiple tiers

PASS Comprehensive System

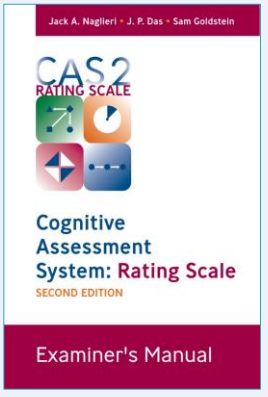
CAS2 (12 subtests)



CAS2: Brief (4 subtests)



CAS2: Rating Scale



conclusions

PASS Comprehensive System

(Naglieri, Das, & Goldstein, 2014)

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

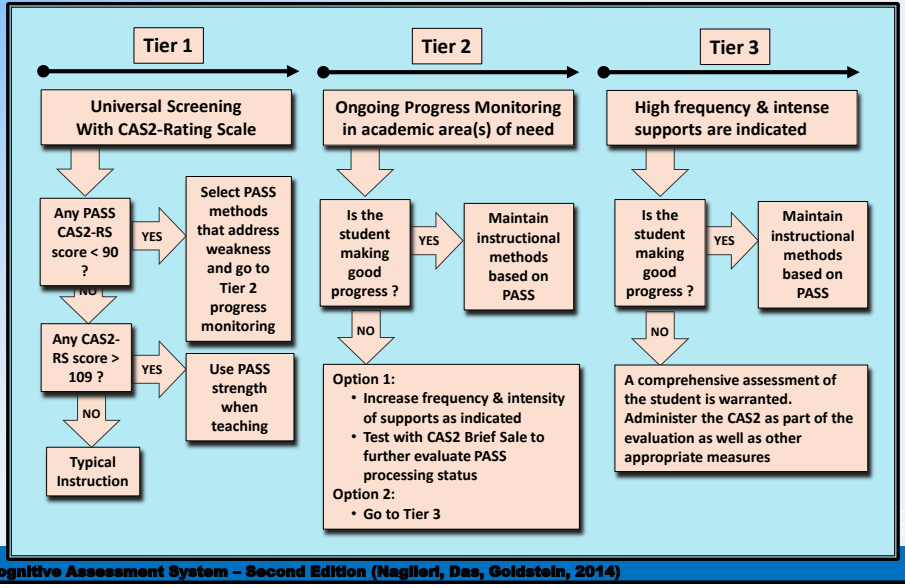
conclusions

PASS Comprehensive System

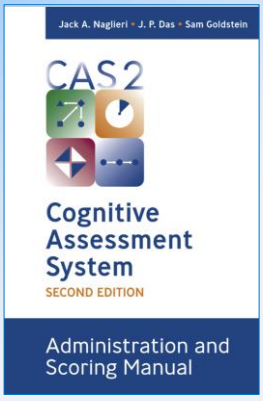
- At Tier 1 CAS2: Rating Scale can be completed by a teacher and depending upon those results…
- At Tier 2 the CAS2: Brief scale could be given to inform instruction and for screening
- At Tier 3 the CAS2: Extended Battery could be given for full evaluation of his neurocognitive abilities
- This PASS Comprehensive System provides three ways to learn about a student's learning strengths and weaknesses

conclusions

PASS Comprehensive System

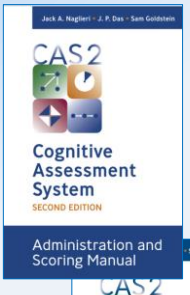


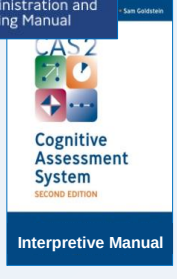
CAS2

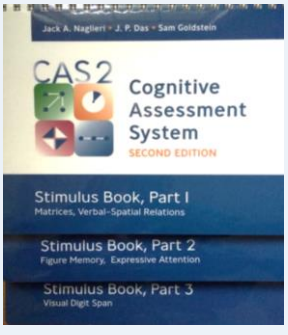


- Structure and features

CAS2 (Ages 5–18 yrs.)







CAS2 Development Goals

- CAS2
  - New norms
  - Strengthen reliability of the scales by modifying subtest formats
  - Improve factor structure
  - Add/delete items
  - Add a visual Successive subtest
  - Add new scales beyond PASS
  - Retain Administration format of
    - Examiner demonstrates,
    - Child does a sample
    - Directions for remaining items is given
    - And opportunity to Provide Help is given

Provide Help

The examiner can explain the demands of the task in any manner deemed appropriate and in any language

Item Set 1

Expose Item Set 1 and say,

Look at this page. There are many boxes for you to fill in (point to the portion of the page with the empty boxes, but do not point in a sweeping motion to the rows or columns). **Fill in as many of these as you can, as fast as you can, using these answers** (point to the coded boxes, and pause for 3–5 seconds to allow the examinee to look at the page). **You can do it any way you want. Let's see how many you can do.**

Ready? (Provide a brief explanation if necessary.)

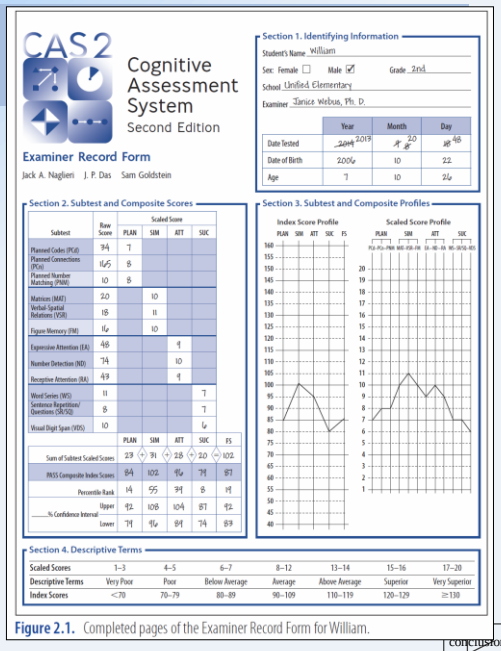
Begin. Start timing. Allow 60 seconds (1:00 minute). Record the time to completion and strategy use.

If the examinee stops or spends more than 1 or 2 seconds erasing, immediately say, **Keep going.**

If the examinee is still working after the time limit expires, say, **Stop.** Record the time in seconds. Note strategy use.

CAS2

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


CAS2 Cognitive Assessment System Second Edition

Examiner Record Form

Jack A. Naglieri J. P. Das Sam Goldstein

Section 1. Identifying Information

Section 2. Subtest and Composite Scores

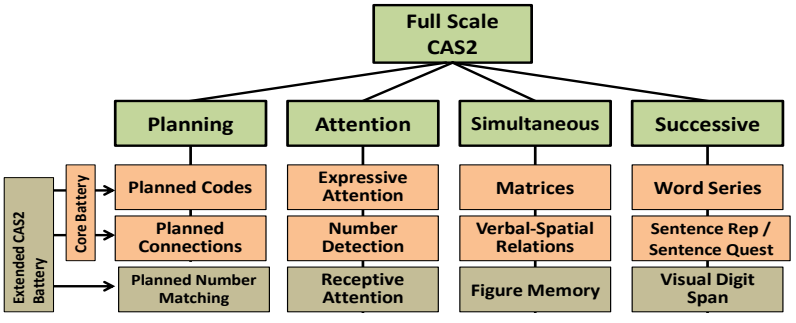
Section 3. Subtest and Composite Profiles

Section 4. Descriptive Terms

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

conclusions

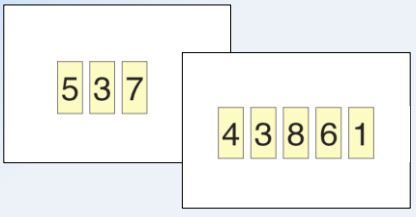
CAS2 Scale and Subtest Structure



conclusions

CAS2

- All subtests modified
- Planning subtests have more items
- Speech Rate deleted
- New: Visual Digit Span subtest



Section 2. Subtest and Composite Scores

Subtest	Raw Score	Scaled Score PLAN	SIM	ATT	SUC
Planned Codes (PCd)	34	7			
Planned Connections (PCn)	165	8			
Planned Number Matching (PNM)	10	8			
Matrices (MAT)	20		10		
Verbal-Spatial Relations (VSR)	18		11		
Figure Memory (FM)	16		10		
Expressive Attention (EA)	48			9	
Number Detection (ND)	74			10	
Receptive Attention (RA)	43			9	
Word Series (WS)	11				7
Sentence Repetition/ Questions (SR/SQ)	8				7
Visual Digit Span (VDS)	10				6

	PLAN	SIM	ATT	SUC	FS
Sum of Subtest Scaled Scores	23	+ 31	+ 28	+ 20	= 102
PASS Composite Index Scores	84	102	96	79	87
Percentile Rank	14	55	39	8	19
____% Confidence Interval Upper	92	108	104	87	92
____% Confidence Interval Lower	79	96	89	74	83

CAS2

- Supplementary Scales: Executive Function, Working Memory, Verbal, Nonverbal
- Added: A Visual and Auditory comparison

Visual–Auditory Comparison

	Scaled Score
Word Series	_____
Visual Digit Span	_____
Difference (ignore sign)	_____
Circle one: .05 .10 NS	

Supplemental Composite Scores

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

	EF w/o WM	EF w/ WM	WM	VC	NvC
Sum of Subtest Scaled Scores	17	35	18	27	27
Composite Index Scores	91	91	94	93	92
Percentile Rank	27	27	34	32	30
____% Confidence Interval Upper	101	99	101	101	99
____% Confidence Interval Lower	84	85	88	87	86

Note: EF w/o WM = Executive Function without Working Memory; EF w/WM = Executive Function with Working Memory; WM = Working Memory; VC = Verbal Content; NvC = Nonverbal Content.

CAS2 Planning & Simultaneous

- Planned Number Matching
  - Variation on the original version
- Planned Codes
  - Variation on the original version
- Planned Connections
  - Additional items
- Matrices
  - More items added
- Verbal-Spatial Relations
  - More items added
- Figure Memory
  - More items added

Cognitive Assessment System – Second Edition (Naglieri, Das, Goldstein, 2014)

CAS2 Attention & Successive

- Expressive Attention
  - No in color
- Number Detection
  - New format
- Receptive Attention
  - New format
- Word Series
- Sentence Repetition
  - Ages 5-7
- Sentence Questions
  - Ages 8-18
- Visual Digit Span
  - New subtest

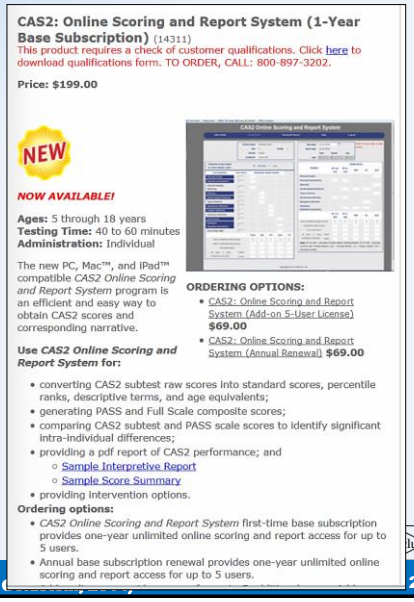
Cognitive Assessment System – Second Edition (Naglieri, Das, Goldstein, 2014)

CAS2 Online Scoring and Report Writing

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



CAS2: Online Scoring and Report System (1-Year Base Subscription) (14311)
This product requires a check of customer qualifications. Click here to download qualifications form. TO ORDER, CALL: 800-897-3202.

Price: $199.00

NEW

NOW AVAILABLE!

Ages: 5 through 18 years
Testing Time: 40 to 60 minutes
Administration: Individual

The new PC, Mac™, and iPad™ compatible *CAS2 Online Scoring and Report System* program is an efficient and easy way to obtain CAS2 scores and corresponding narrative.

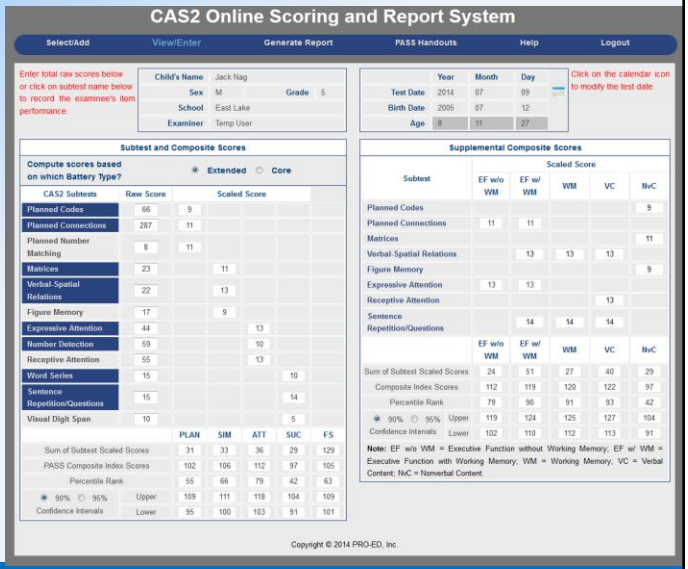
ORDERING OPTIONS:
- CAS2: Online Scoring and Report System (Add-on 5-User License) **$69.00**
- CAS2: Online Scoring and Report System (Annual Renewal) **$69.00**

Use *CAS2 Online Scoring and Report System* for:
- converting CAS2 subtest raw scores into standard scores, percentile ranks, descriptive terms, and age equivalents;
- generating PASS and Full Scale composite scores;
- comparing CAS2 subtest and PASS scale scores to identify significant intra-individual differences;
- providing a pdf report of CAS2 performance; and
  - Sample Interpretive Report
  - Sample Score Summary
- providing intervention options.

Ordering options:
- *CAS2 Online Scoring and Report System* first-time base subscription provides one-year unlimited online scoring and report access for up to 5 users.
- Annual base subscription renewal provides one-year unlimited online scoring and report access for up to 5 users.

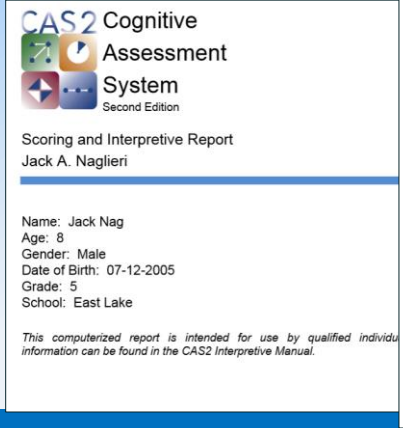
CAS2 Online Score & Report

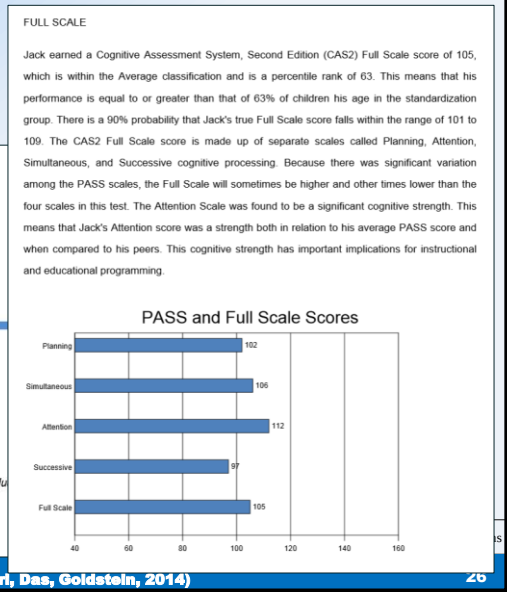
- As values are entered the program completes the record form
- Supplemental scales are automatically computed
  - Executive Function
  - Working Memory
  - Verbal
  - Nonverbal



CAS2 Online Score & Report

- Narrative report can be obtained in Word or PDF





CAS2 Online Report Text

FULL SCALE

Jack earned a Cognitive Assessment System, Second Edition (CAS2) Full Scale score of 105, which is within the Average classification and is a percentile rank of 63. This means that his performance is equal to or greater than that of 63% of children his age in the standardization group. There is a 90% probability that Jack's true Full Scale score falls within the range of 101 to 109. 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 Attention Scale was found to be a significant cognitive strength. This means that Jack's Attention 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.

CAS2 Online Report Text

PLANNING SCALE

Sam's Planning processing score was significantly above his average PASS score and well above the Average range. This means that Sam performed particularly well on tests that required strategies for solving the problems on the Planning tests. He did very well when the task required the development and use of good strategies, control of behavior, self-monitoring, and self-correction. Sam earned a CAS2 Planning scale score of 138 which is within the Very Superior classification and is a percentile rank of 99.4. The percentile rank indicates that Sam did as well as or better than 99.4% of others his age in the standardization group. There is a 90% probability that Sam's true Planning score is within the range of 128 to 142. This cognitive strength has important implications for educational programming because children who are strong in Planning have exceptional ability to solve problems in unique and efficient ways, they can be flexible in their thinking and acting, and can be quite creative. Instructional methods that involve this learning strength in Planning processing should be utilized.

CAS2 Online Score & Report

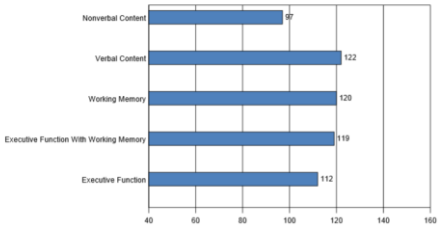
- Narrative report includes additional scales

CAS2 Cognitive Assessment System
Second Edition

Scoring and Interpretive Report
Jack A. Naglieri

Name: Jack Nag
Age: 8
Gender: Male
Date of Birth: 07-12-2005
Grade: 5
School: East Lake

This computerized report is intended for use by qualified ind
information can be found in the CAS2 Interpretive Manual.



VISUAL-AUDITORY COMPARISON

Jack's scores on the subtests in the Successive processing scale that involved visual (Visual Digit Span) or auditory (Word Series) presentation of information were compared to determine if the difference in the modality of the task may have had relevance. There was a significant difference between the two subtests that measured Successive processing when the information was given using an auditory (Word Series) or visual (Visual Digit Span) presentation. Jack's score of 5 on the visual subtest falls within the Poor classification and is significantly lower than his score of 10 on the auditory subtest which falls within the Average classification. This information may have educational and therapeutic implications, and further exploration may be warranted.

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CAS2 Online Score & Report

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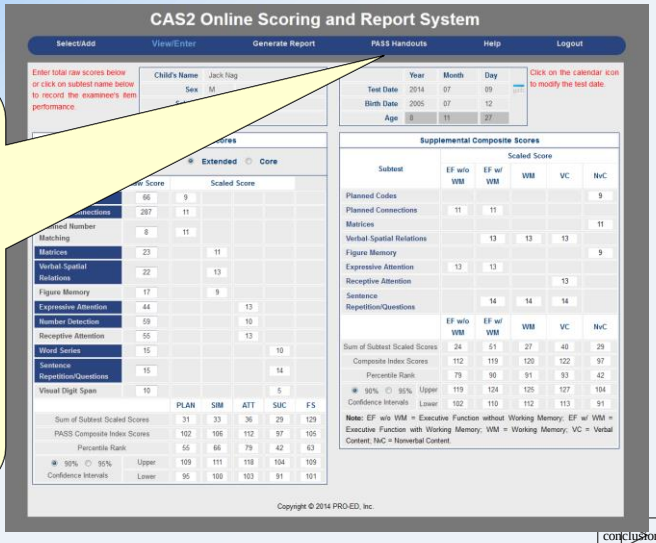
CAS2 Online Score & Report

Online program includes PASS handouts from Helping Children Learn (2nd Edition) in English and Spanish



CAS2: Brief

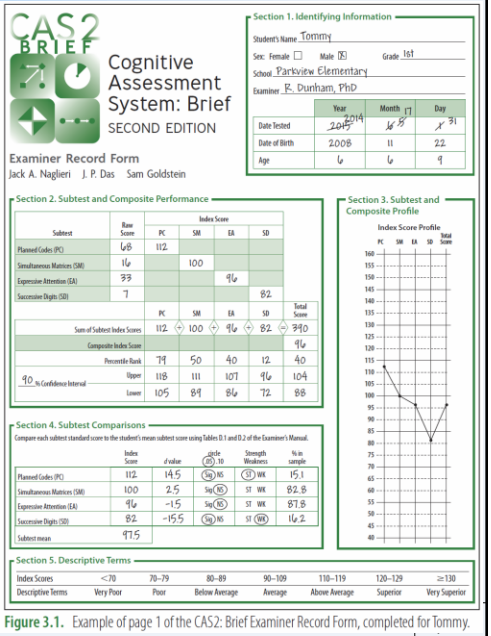
- Structure and features

CAS2: Brief for Ages 4–18 years

conclusions

CAS2: Brief

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


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	2019	6	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
Lower	105	89	86	72	88

Section 3. Subtest and Composite Profile

Index Score Profile

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) .10	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 NS	ST WK	16.2
Subtest mean	97.5				

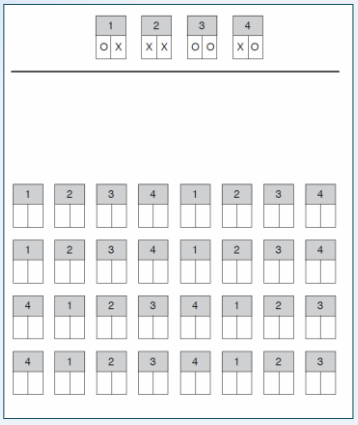
Section 5. Descriptive Terms

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 Scale

- Planned Codes is used for Planning ability
- Eight items using numbers not letters as in CAS2 and different orientation of the pages



conclusions

CAS2: Brief Simultaneous Matrices

Simultaneous Matrices

Administration:
Age-based entry points; apply ceiling (ceiling of 4; basal of 2, if needed)

Materials:
CAS2: Brief Stimulus Book (pp. 1–90); #2 pencils

Objective:
Examinees should select the option that best completes the matrix.

Entry Points and Basals: If an examinee age 12–18 fails the first item, administer previous items in reverse order until two consecutive correct answers have been obtained (basal). Record the response in the appropriate column, and then score the response (1 = *correct*, 0 = *incorrect*) for each item.

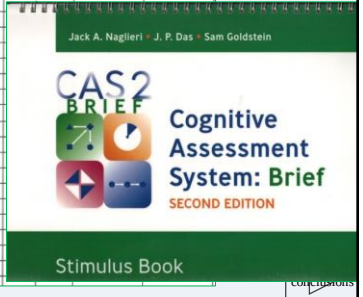
Discontinue Rule: Discontinue subtest if examinee receives four consecutive incorrect responses.

Directions for All Examinees:
Show example in the CAS2: Brief Stimulus Book (p. 1), and say, **Look at this page. There is a piece missing here** (point to the question mark). **Which one of these** (point to the five options in a sweeping motion) **goes here?** (Point to the question mark.) If the response is correct, say, **Yes, that's the right one because it's all yellow.** If incorrect, point to Option 3 and say, **This is the right one because it's all yellow.** (If necessary, provide a brief explanation.) Continue with directions for the appropriate age group.

Directions for Examinees Ages 4–11:
Show item 1 and say, **Look at this page. There is a piece missing here.**

Directions for the Remaining Items:
For each item, say as needed, **There is a piece missing here** (point to the question mark). **Which one of these** (point to the options in a sweeping motion) **goes here?** (Point to the question mark.) When the question is no longer necessary, say, **Now do this one.** (Provide no additional help.) If the examinee does not respond after about 60 seconds, encourage him or her to choose one of the options. If the examinee still does not respond, say, **Let's try the next one.** (Show the next item.)

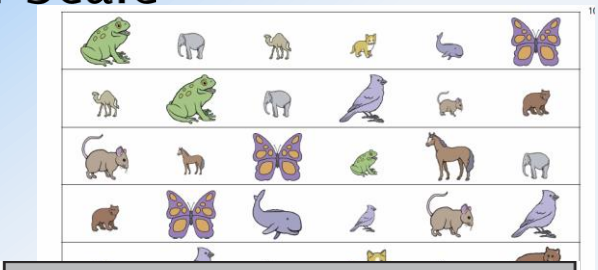
	Item	Correct Response	Examinee's Response	Score (1 or 0)
All Ages	Example	3		
4–11 Years	1.	2		
	2.			
	3.			
	4.			
	5.			
	6.			
	7.			
	8.			
	9.			
	10.			
12–18 Years	11.			
	12.			
	13.			
	14.			
	15.			
	16.			
	17.			
	18.			
	19.			
	20.			



conclusions

CAS2: Brief Scale

- Expressive Attention (Stroop) used
- Big/Little animals (ages 4–7 years)
- Color Words (ages 8–18)



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

CAS2: Brief Planned Codes & Successive Digits

- Planned Codes has 8 items using numbers not letters and has different patterns
- Successive Digits uses numbers (not words)

Directions for Reported Strategies:

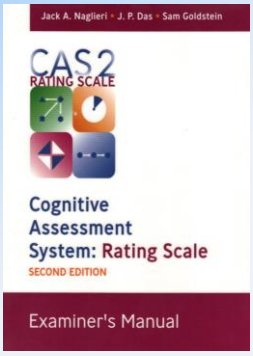
After all item sets have been completed, with Item Set 6 still showing, say, Tell me how you did these. Indicate the pages in the Student Response Booklet just completed by the examinee. If necessary, say, How did you complete the pages? You may briefly clarify the question, provided that you give no examples. Record the examinee's reported strategies in the "Reported" column of the Strategy Checklist, as applied to each item set.

	Item Set	Time Limit	Time in Seconds	Accuracy Score (Number Correct)	Ratio Score (see pages 9–11)
All Ages	Example A				
	1.	60" (1:00)			
	Example B				
	2.	60" (1:00)			
	3.	60" (1:00)			
	Example C				
	4.	60" (1:00)			
	Example D				
	5.	60" (1:00)			
	6.	60" (1:00)			
				=	
	Raw Score (sum of ratio scores)				

Strategy Checklist			
Observed	Reported	Description of Strategy	Item Set
		1. Coded left to right, top to bottom	
		2. Said codes to self out loud	
		3. Coded one letter at a time (e.g., did As, then Bs)	
		4. Coded neatly and slowly	
		5. Used a pattern found in a previous item	
		6. Looked for the pattern in the item	
		7. Looked at codes already completed, rather than using the key	

Other:
Observed _____
Reported _____

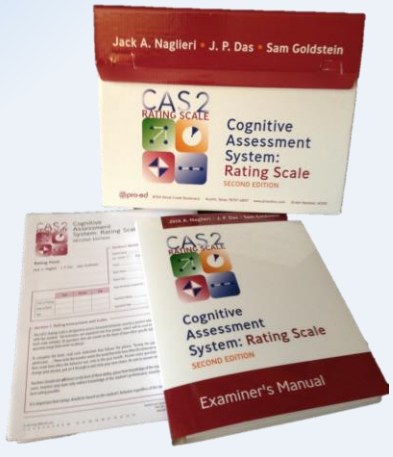
CAS2: Rating Scale



- Structure and features

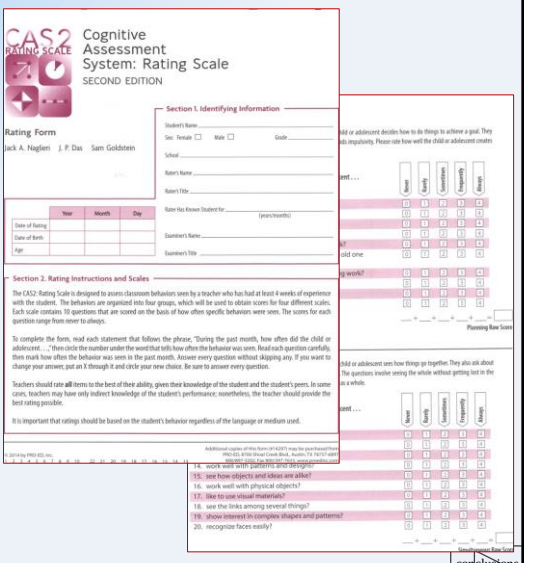
CAS2 Rating Scales (Ages 4–18 yrs.)

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



CAS2 Rating Scales

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



CAS2 Rating Scales

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

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

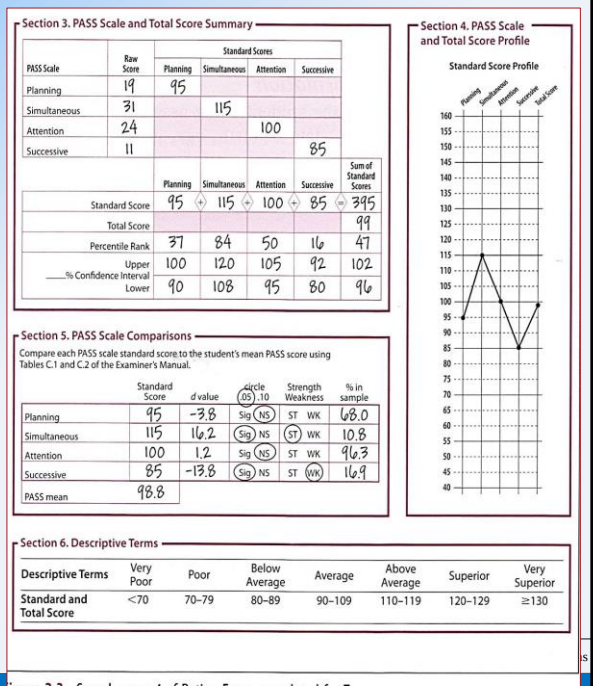
Directions for Items 11–20. These questions ask how well the child or adolescent sees how things go together. They also ask about working with diagrams and understanding how ideas fit together. The questions involve seeing the whole without getting lost in the parts. Please rate how well the child or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

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

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

CAS2 Rating Scales

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



Section 3. PASS Scale and Total Score Summary

PASS Scale	Raw Score	Standard Scores: Planning	Simultaneous	Attention	Successive
Planning	19	95			
Simultaneous	31		115		
Attention	24			100	
Successive	11				85

	Planning	Simultaneous	Attention	Successive	Sum of Standard Scores
Standard Score	95	115	100	85	395
Total Score					99
Percentile Rank	37	84	50	16	47
Upper 95% Confidence Interval	100	120	105	92	102
Lower 95% Confidence Interval	90	108	95	80	96

Section 4. PASS Scale and Total Score Profile

Standard Score Profile

Section 5. PASS Scale Comparisons

Compare each PASS scale standard score to the student's mean PASS score using Tables C.1 and C.2 of the Examiner's Manual.

	Standard Score	d value	Circle .05 .10	Strength Weakness	% in sample
Planning	95	-3.8	Sig (NS)	ST WK	68.0
Simultaneous	115	16.2	(Sig) NS	(ST) WK	10.8
Attention	100	1.2	Sig (NS)	ST WK	96.3
Successive	85	-13.8	(Sig) NS	ST (WK)	16.9
PASS mean	98.8				

Section 6. Descriptive Terms

Descriptive Terms	Very Poor	Poor	Below Average	Average	Above Average	Superior	Very Superior
Standard and Total Score	<70	70–79	80–89	90–109	110–119	120–129	≥130

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

PASS: Across the Three Measures

	CAS2 Rating Scale Items ask how well the child...	CAS2	CAS2 Brief
Planning	thinks before acting, creates plans, uses strategies to achieve a goal.	Planned Codes Planned Connections Planned Number Matching	Planned Codes
Attention	can focus attention to one thing at at time and resists distractions.	Expressive Attention Number Detection Receptive Attention	Expressive Attention
Simultaneous	understands how parts combine to make a whole and see the big picture.	Matrices Verbal-Spatial Relations Figure Memory	Simultaneous Matrices
Successive	works with numbers, words or ideas that are arranged in a specific series.	Word series Sentence Repetition/Questions Visual Digit Span	Successive Digits

conclusions

Characteristics of the CAS2, CAS2: Brief CAS2: Rating Scale

A Summary

CAS2: Scale Reliability (ages 5–18)

- CAS2 Scale Reliabilities are very high
- **Full Scale = .97** for 12 subtest Extended Battery CAS2
  - (.95 for 8-subtest Core Battery)

Core Battery	
Planning	.90
Simultaneous	.93
Attention	.86
Successive	.89
Full Scale	.95
Extended Battery	
Planning	.92
Simultaneous	.94
Attention	.90
Successive	.92
Full Scale	.97

CAS2: Subtest Reliability

- CAS2 Subtests Reliabilities are high
- (ages 5–18)

Subtests	Average[a]
Planned Codes	.88
Planned Connections	.80
Planned Number Matching	.82
Matrices	.88
Verbal–Spatial Relations	.91
Figure Memory	.85
Expressive Attention	.82
Number Detection	.80
Receptive Attention	.83
Word Series	.83
Sentence Repetition	.83
Sentence Questions	.85
Visual Digit Span	.86

CAS2: Scale Reliability (ages 5–18)

- Supplemental Scales reliabilities are also high

Supplemental composites	
Executive Function w/o Working Memory	.86
Executive Function w/ Working Memory	.91
Working Memory	.92
Verbal Content	.91
Nonverbal Content	.92

CAS2: Brief Reliability

- Average reliability across ages 4 – 18 years:

Planning = .93
Simultaneous = .88
Successive = .86
Successive = .85
Total Score = .94

Table 5.1 Coefficient Alphas for CAS2: Brief Scores at 15 Age Intervals

	Subtest				Composite
Age (in years)	Planned Codes	Simultaneous Matrices	Expressive Attention[a]	Successive Digits	Total Score
4	.89	.84	.96	.84	.94
5	.91	.86	.91	.86	.94
6	.92	.88	.93	.88	.95
7	.94	.89	.91	.81	.94
8	.96	.89	.81	.87	.94
9	.93	.87	.86	.89	.94
10	.88	.87	.80	.83	.91
11	.95	.90	.88	.88	.95
12	.93	.87	.88	.84	.93
13	.91	.89	.83	.86	.93
14	.97	.91	.92	.88	.96
15	.96	.88	.90	.80	.94
16	.94	.90	.94	.85	.95
17	.93	.91	.90	.87	.95
18	.92	.89	.86	.85	.93
Average[b]	.93	.88	.89	.86	.94

conclusions

CAS2: Rating Scale Reliability

Table 4.7 Summary of CAS2: Rating Scale Reliability Related to Three Types of Reliability Coefficients

CAS2: Rating Scale values	Types of reliability coefficients		
	Coefficient alpha	Test–retest	Scorer
PASS scales			
Planning	.95	.89	.99
Simultaneous	.93	.91	.99
Attention	.96	.90	.99
Successive	.94	.90	.99
Total Score	.98	.91	.99
Sources of error[a]	Content sampling, content heterogeneity	Time sampling	Interscorer differences

[a]These sources are from *Psychological Testing* (7th ed.), by A. Anastasi and S. Urbina, 1997, Upper Saddle River, NJ: Prentice Hall.

conclusions

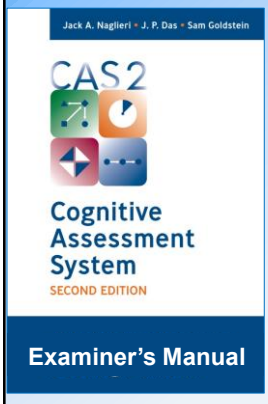
Confirmatory Factor Analysis

Three PASS scales and the same findings…

CFA Results

- All Confirmatory Factor Analyses for each of the three scales tested these solutions:
  - 1 factor – no PASS scales
  - 2 factor – Planning/Attention, Simultaneous/Successive
  - 3 factor – Planning/Attention, Simultaneous, Successive
  - 4 factor – Planning, Attention, Simultaneous, Successive
- Analyses were at the subtest level for CAS2, Item packets for the CAS2: Brief, and the item level for CAS2: Rating Scale.

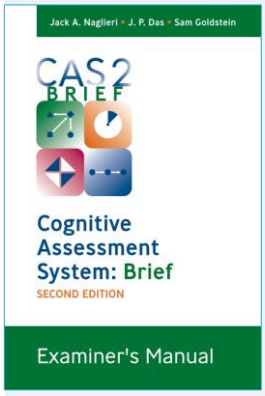
CAS2 Fit Indexes By Age



Model			Fit Indexes		
Ages 5-7	**Chi Sq.**	**DF**	**Chi Sq./DF**	**TLI**	**CFI**	**RMSEA**
One Factor	303.47	54	5.62	0.775	0.816	0.123
(PA) (SS)	186.93	53	3.527	0.877	0.901	0.091
(PA) SS	178.76	51	3.505	0.878	0.906	0.091
P A S S	152	48	3.17	0.89	0.92	0.084
Ages 8-10	**Chi Sq.**	**DF**	**Chi Sq./DF**	**TLI**	**CFI**	**RMSEA**
One Factor	335.46	54	6.212	0.771	0.812	0.123
(PA) (SS)	150.13	53	2.833	0.919	0.935	0.073
(PA) SS	111.02	51	2.177	0.948	0.96	0.058
P A S S	100.96	48	2.1	0.951	0.965	0.057
Ages 11-13	**Chi Sq.**	**DF**	**Chi Sq./DF**	**TLI**	**CFI**	**RMSEA**
One Factor	429.59	54	7.955	0.642	0.707	0.153
(PA) (SS)	204.74	53	3.863	0.853	0.882	0.098
(PA) SS	161.16	51	3.16	0.889	0.914	0.085
P A S S	131.74	48	2.745	0.91	0.935	0.077
Ages 14-18	**Chi Sq.**	**DF**	**Chi Sq./DF**	**TLI**	**CFI**	**RMSEA**
One Factor	557.34	54	10.321	0.644	0.709	0.154
(PA) (SS)	315.5	53	5.953	0.811	0.848	0.112
(PA) SS	291.68	51	5.719	0.82	0.861	0.11
P A S S	244.14	48	5.086	0.844	0.887	0.102

CAS2: Brief Fit Indexes by Age

Model			Fit Indexes			
Ages 4-7	**Chi Sq.**	**DF**	**Chi Sq./DF**	**TLI**	**CFI**	**RMSEA**
One Factor	2095.59	65	32.24	0.366	0.547	0.292
(PA) (SS)	1326.52	64	20.73	0.600	0.718	0.232
(PA) SS	510.43	62	8.23	0.853	0.900	0.140
P A S S	65.23	59	1.11	0.998	0.999	0.017
Ages 8-10	**Chi Sq.**	**DF**	**Chi Sq./DF**	**TLI**	**CFI**	**RMSEA**
One Factor	1670.37	65	25.70	0.322	0.516	0.264
(PA) (SS)	872.85	64	13.64	0.653	0.756	0.189
(PA) SS	245.17	62	3.95	0.919	0.945	0.091
P A S S	69.72	59	1.18	0.995	0.997	0.023
Ages 11-13	**Chi Sq.**	**DF**	**Chi Sq./DF**	**TLI**	**CFI**	**RMSEA**
One Factor	1448.55	65	22.29	0.229	0.449	0.271
(PA) (SS)	935.01	64	14.61	0.507	0.653	0.217
(PA) SS	333.54	62	5.38	0.841	0.892	0.123
P A S S	78.14	59	1.32	0.988	0.992	0.033
Ages 14-18	**Chi Sq.**	**DF**	**Chi Sq./DF**	**TLI**	**CFI**	**RMSEA**
One Factor	2133.05	65	32.82	0.235	0.453	0.281
(PA) (SS)	1318.03	64	20.59	0.529	0.669	0.221
(PA) SS	617.82	62	9.96	0.784	0.853	0.149
P A S S	94.11	59	1.60	0.986	0.991	0.038



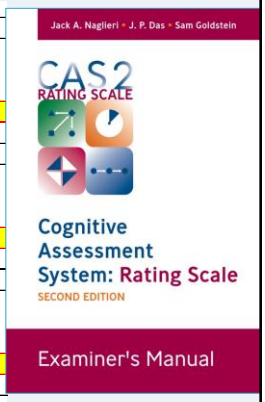
CAS2: Rating Scale Fit Indexes

Ages 4-7	Chi Sq.	DF	Chi Sq./DF	TLI	CFI	RMSEA
One Factor	6270.89	740	8.47	0.505	0.530	0.147
(PA) (SS)	5485.93	739	7.42	0.575	0.597	0.136
(PA) SS	4415.10	737	5.99	0.669	0.688	0.120
P A S S	2950.09	734	4.02	0.800	0.812	0.093

Ages 8-10	Chi Sq.	DF	Chi Sq./DF	TLI	CFI	RMSEA
One Factor	4522.97	740	6.11	0.606	0.626	0.141
(PA) (SS)	3603.22	739	4.88	0.701	0.717	0.123
(PA) SS	3045.86	737	4.13	0.758	0.772	0.111
P A S S	2154.15	734	2.93	0.851	0.860	0.087

Ages 11-13	Chi Sq.	DF	Chi Sq./DF	TLI	CFI	RMSEA
One Factor	4202.29	740	5.68	0.668	0.685	0.138
(PA) (SS)	3443.30	739	4.66	0.740	0.754	0.122
(PA) SS	2965.39	737	4.02	0.785	0.797	0.111
P A S S	1960.00	734	2.67	0.881	0.888	0.083

Ages 14-18	Chi Sq.	DF	Chi Sq./DF	TLI	CFI	RMSEA
One Factor	12543.77	740	16.95	0.419	0.517	0.173
(PA) (SS)	9696.12	739	13.12	0.613	0.634	0.151
(PA) SS	6628.39	737	8.99	0.745	0.759	0.123
P A S S	3410.38	734	4.35	0.884	0.890	0.083



conclusions

Planning Subtests and Strategy Use

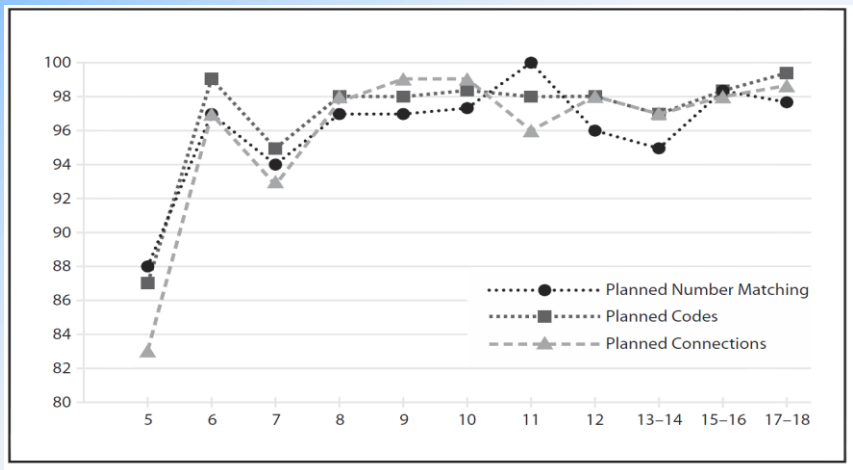


Figure 5.1. Percentage of the standardization sample, by age, who used strategies on the Planning subtests.

conclusions

CAS2 and CAS2: Brief

- Long and short are highly related…

CAS2: Brief with CAS2 Extended

- Similar means and high correlations

Table 6.2 Correlations Between the CAS2 and the CAS2: Brief

	CAS2: Brief values					
	Planned Codes	Simultaneous Matrices	Expressive Attention	Successive Digits	Total Score	CAS2
CAS2 values	r_c (r_u)	r_c (r_u)	r_c (r_u)	r_c (r_u)	r_c (r_u)	*M* (*SD*)
Extended Battery						
Planning	.644 (.596)	.332 (.332)	.516 (.404)	.217 (.184)	.618 (.567)	101.06 (14.56)
Simultaneous	.432 (.352)	.619 (.574)	.459 (.320)	.408 (.318)	.692 (.598)	98.22 (13.04)
Attention	.475 (.403)	.327 (.305)	.570 (.426)	.278 (.220)	.581 (.501)	99.17 (13.49)
Successive	.239 (.200)	.434 (.412)	.287 (.202)	.795 (.721)	.656 (.580)	98.01 (13.68)
Full Scale	.580 (.509)	.558 (.533)	.594 (.453)	.551 (.463)	.798 (.736)	98.48 (13.74)
Magnitude[a]	Large	Large	Large	Large	Very Large	
CAS2: Brief *M* (*SD*)	100.01 (13.56)	99.92 (15.38)	103.89 (11.32)	98.24 (12.96)	100.35 (13.49)	

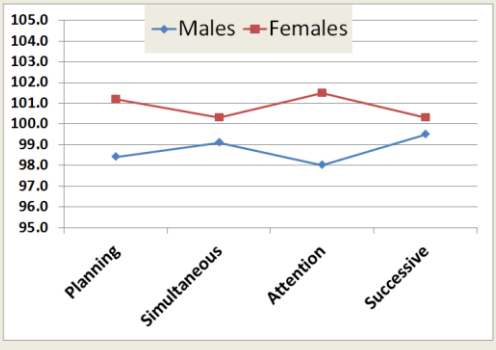
Note. $N = 281$. r_c = coefficients corrected for range effects; r_u = uncorrected coefficients; CAS2 = *Cognitive Assessment System, Second Edition* (Naglieri, Das, & Goldstein, 2014a).

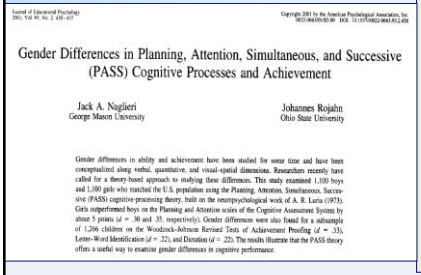
Differences by Sex, Race, and Ethnicity

CAS2 Male Female Comparison

- Results similar to previous research (Naglieri & Rojahn, 2001)

	Males	Females	d-ratio
Planning	98.4	101.2	0.19
Simultaneous	99.1	100.3	0.08
Attention	98.0	101.5	0.24
Successive	99.5	100.3	0.07
Full Scale	98.4	101.2	0.18





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

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

CAS2 Race Comparison

- CAS2 Manual (page 105)
  - African Americans and non-African Americans differed on the Full Scale Extended Battery by 4.5 standard score points (4.9 on the Core Battery) with controls for demographic characteristics.
  - These findings, which are similar to those found for the CAS (Naglieri, Rojahn, Matto, and Aquilino (2005) and suggest that race has a small relationship to scores obtained on the CAS2.

CAS2 Ethnic Comparison

- CAS2 Manual (page 106)
  - Hispanics and non-Hispanics Full Scale standard scores differed by 1.8 points (2.3 on the Core Battery) with controls for demographic characteristics.
  - These findings suggest that Hispanic origin has only a small relationship to scores obtained on the CAS2, as was found for the CAS (Naglieri, Rojahn, & Matto, 2007).

CAS2: Brief

- Very small differences by Race/ethnicity

Table 6.10 CAS2: Brief Means and Standard Deviations for Selected Subgroups

	CAS2: Brief values									
	Planned Codes		Simultaneous Matrices		Expressive Attention		Successive Digits		Total Score	
Subgroup	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Gender										
Male (n = 734)	98.92	14.37	100.52	15.33	99.77	15.57	99.59	15.01	99.21	14.82
Female (n = 683)	101.99	14.31	100.36	15.17	100.36	15.00	101.00	14.00	101.00	15.00
Race/ethnicity										
White (n = 1,127)	100.34	14.33	100.39	15.35	100.42	14.37	100.14	14.87	100.06	14.89
Black/African American (n = 206)	100.32	15.04	98.90	15.46	95.90	15.16	100.66	14.67	98.09	16.81
Hispanic (n = 246)	98.17	13.44	98.97	15.45	99.90	14.05	97.19	14.05	97.29	14.56

conclusions

Topical Outline

- Introduction to PASS measured by CAS2
- CAS2, CAS2-Brief and CAS2-Rating Scale
- PASS processes Revisited SKIP
  - PASS neurocognitive processes
- Why PASS and CAS?
  - IQ test Profiles, Race/Ethnic Differences, Intervention
- Interpretation of CAS2, CAS2: Brief, and CAS2: Rating Scale
  - Using CAS2 for Eligibility Determination
  - Using CAS2 for Academic Intervention

conclusions

Basic Psychological Processes

Connecting IDEA with practice

conclusions

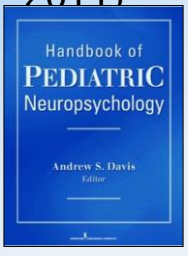
PASS Neurocognitive Theory

- **PASS** theory is a modern way to measure neurocognitive abilities defined by brain function
- **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

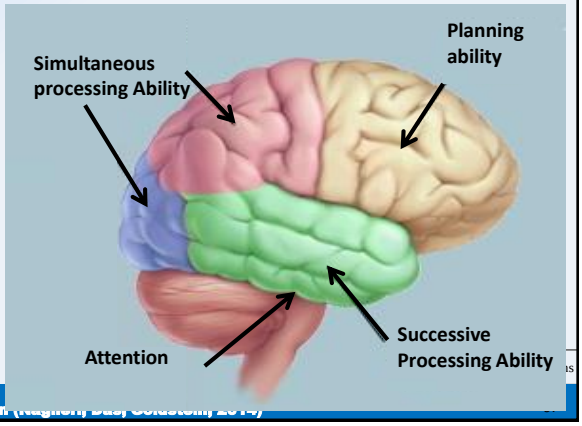
conclusions

Brain, Cognition, & Intelligence

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



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



What is a Neurocognitive Process?

- We use the tern neurocognitive as a way to describe PASS because the theory is built on neuropsychology (e.g., Luria) and cognitive psychology
- How did we identify the neurocognitive constructs?
  - Not by using factor analysis
  - Not by assigning new labels to traditional IQ tests
  - We used the literature in cognitive and the neuropsychology
  - Our focus was on A. R. Luria's conceptualization of the three functional units

What is a Neurocognitive Process?

- The term cognitive process is a modern term for concepts like ability
- The term describes a basic psychological processing theory based on brain function
- PASS neurocognitive abilities provide us the means to function in this world and acquire knowledge and skills
  - Skills, like reading decoding or math calculation, are *not* examples of a cognitive process, they are the application of a cognitive process in a specific content area

What is a Neurocognitive Process?

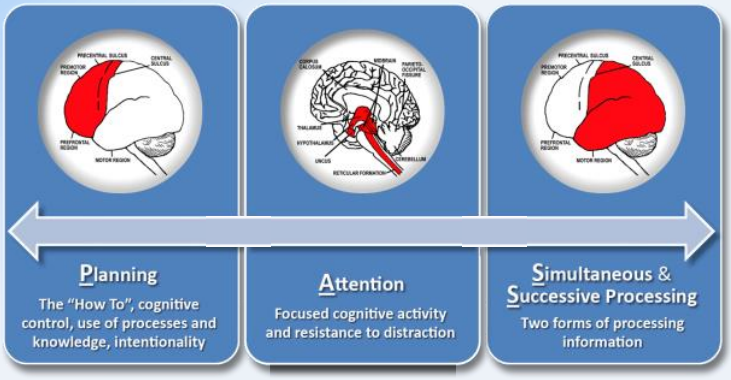
- A specific cognitive process provides a unique kind of function
- A variety of cognitive processes is needed to meet the many demands of our complex environment
- A variety of cognitive processes gives us away of achieving the same goal using different types of or different combinations of processes (this is important for intervention planning).

What is a Neurocognitive Process?

- We must assess neurocognitive processes from a THEORY of brain function (not factor analysis).
- Assess achievement with tests that adequately evaluate the domain of interest (e.g., reading, math, etc.)
- Assess neurocognitive processes using questions that are as free of academic content as possible

PASS: A neurocognitive approach

Three Functional Units described by A. R. Luria (1972)



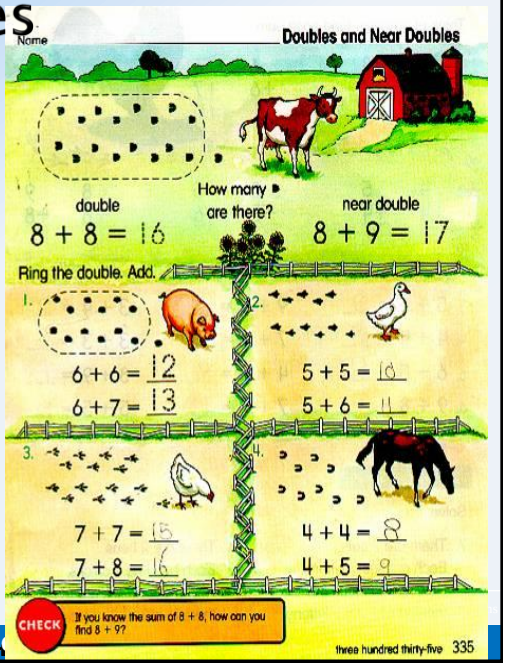
PASS Theory

- **Planning** is a basic neurocognitive ability which we use to determine, select, and use efficient solutions to problems
  - problem solving
  - developing plans and using strategies
  - impulse control and self-control
  - control of processing
  - retrieval of knowledge

conclusions

Math Strategies

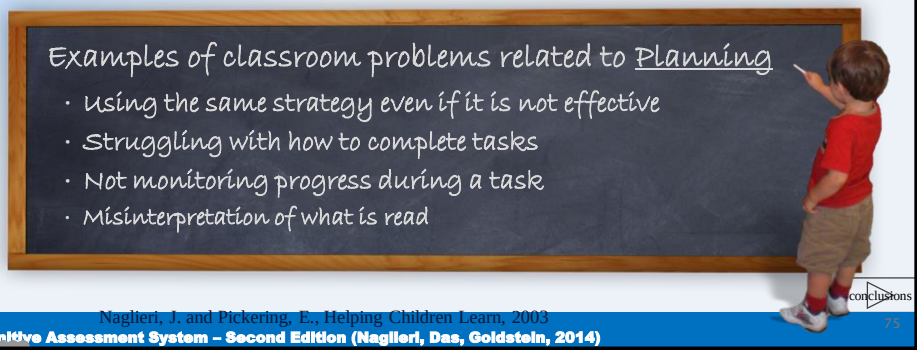
Note to the Teacher:
When we teach children skills by helping them use strategies and plans for learning, we are teaching both knowledge and processing. Both are important.



PASS Theory: Planning

Planning

- Evaluate a task
- Select or develop a strategy to approach a task
- Monitor progress during the task
- Develop new strategies when necessary

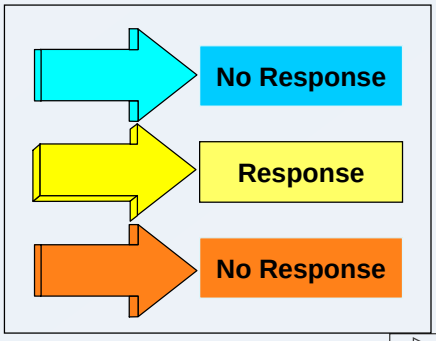


conclusions

Naglieri, J. and Pickering, E., Helping Children Learn, 2003

PASS Theory

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



conclusions

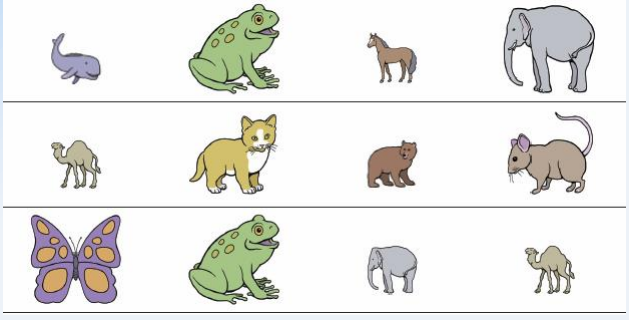
CAS2 Expressive Attention

- The child says the color not the word
- Score is time and number correct

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

Expressive Attention: 5–7 years

The child tells if the animal is large or small, regardless of the relative size on the page.



Attention

This sheet has a strong Attention demands because of the similarity of the options

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.

14. Lance fished from 6:00 A.M. to 9:45 A.M. How long did he fish?

A 3 hours **B** 3 hours and 15 minutes
C 3 hours and 45 minutes **D** 4 hours and 45 minutes

Use the calendar for 15 - 17

11. C 3:15 p.m.

12. D 6:22 p.m.

13. A 3:50 p.m.

14. C 3 hours 45 min.

Cognitive Assessment System –

Attention

This work sheet has a strong ATTENTION demand because the child has to look for a specific target among many distracting stimuli

1. Which numbers have 6 in the ones place? Ring them.

46 79 64 66 96 61 26

2. Which numbers have 6 in the tens place? Ring them.

46 64 60 16 67 36 61

3. Which numbers have 9 in the ones place? Ring them.

97 19 69 96 39 93 89

4. Which numbers have 3 in the tens place? Ring them.

39 43 83 35 13 37 30

Find each number.

Think

5. I have a 7 in the tens place and a 6 in the ones place.

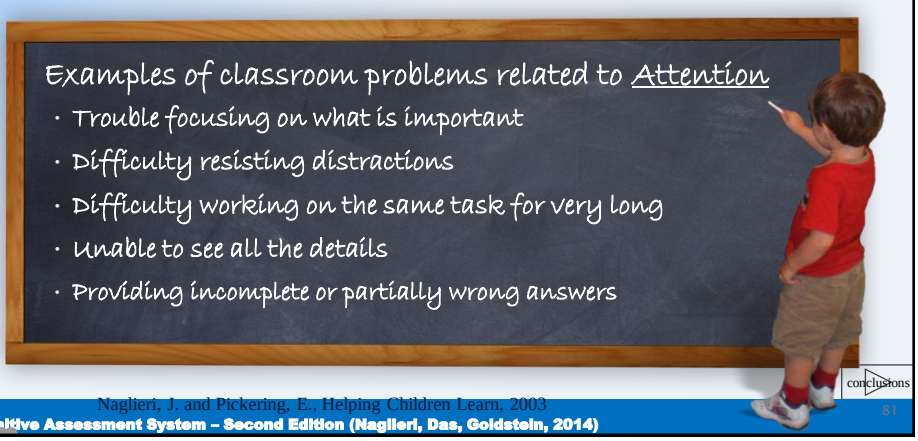
★6. I have a 4 in the tens place. The number in the ones place is

Cognitive Assessment System – Second Edition (Naglieri, Das, Goldstein, 2014)

PASS Theory: Attention

Attention

- Focus on one thing and ignore others
- Resist distractions in the learning environment



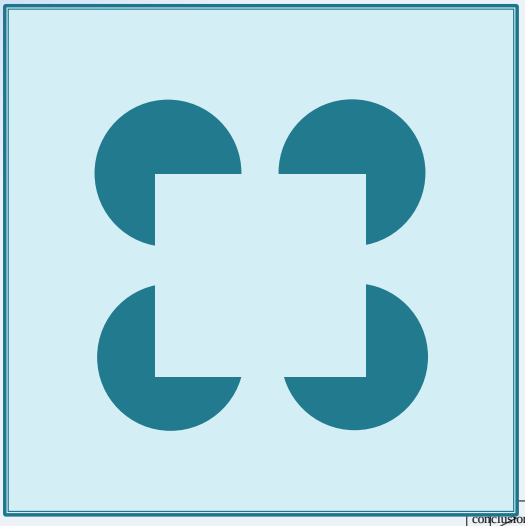
Naglieri, J. and Pickering, E., Helping Children Learn, 2003

PASS Theory

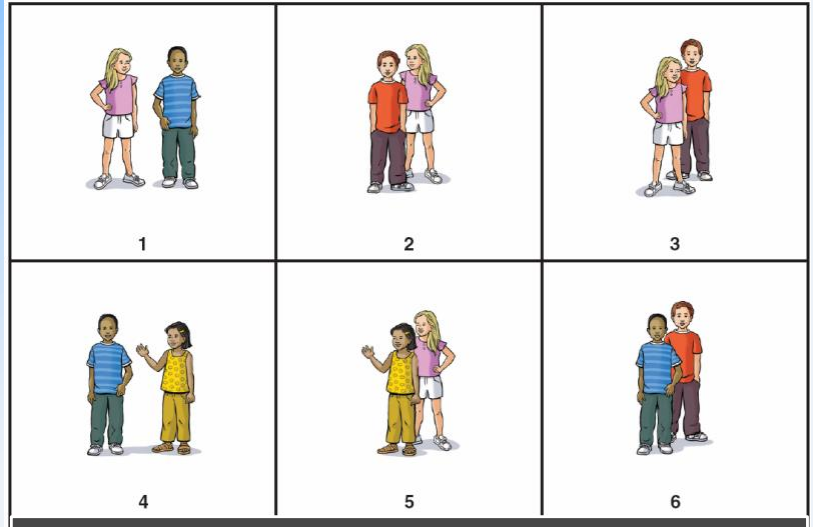
- **Simultaneous** processing is a basic neurocognitive ability which we use to integrate stimuli into groups
  - Stimuli are seen as a whole
  - Each piece must be related to the others
  - Wechsler Nonverbal Scale
  - KABC Simultaneous Scale

PASS Theory

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



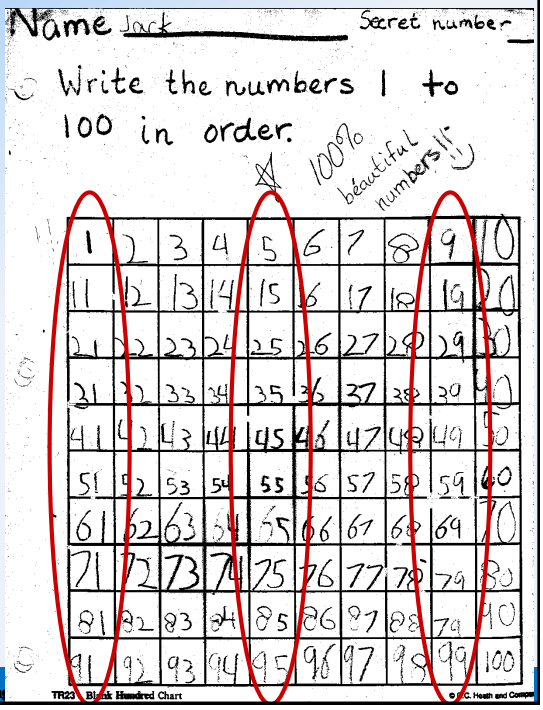
CAS2 Verbal-Spatial Relations



Which picture shows a boy behind a girl?

Numbers from 1 to 100

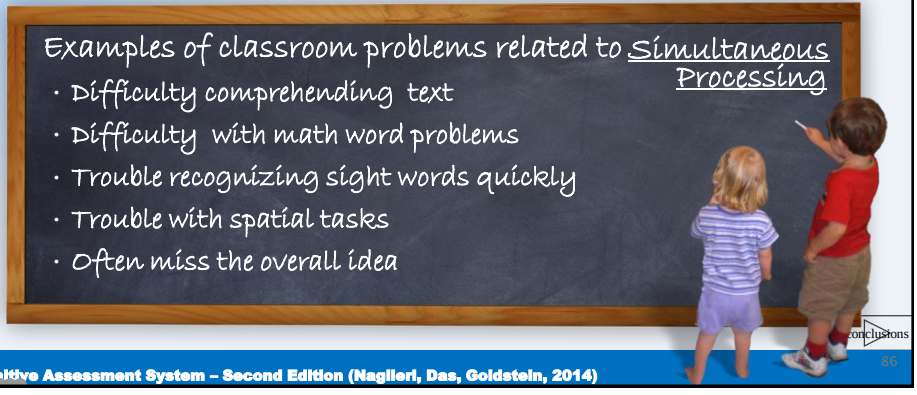
How is … Simultaneous processing facilitated by this work sheet?



PASS Theory: Simultaneous

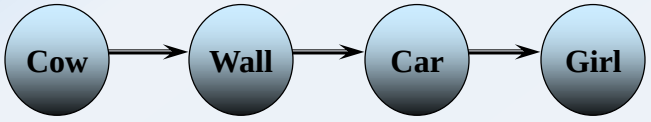
Simultaneous Processing

- Relate separate pieces of information into a group
- See how parts related to whole
- Recognize patterns



Modern Theory: Successive

- **Successive** processing is a basic neurocognitive ability which we use to manage stimuli in a specific serial order
  - Stimuli form a chain-like progression
  - Stimuli are not inter-related



conclusions

Word Series

- The child repeats a series of words in the same order the examiner says them

1. Wall-Car
2. Shoe-Key

...

10. Cow-Wall-Car-Girl
11. Dog-Car-Girl-Shoe-Key

...

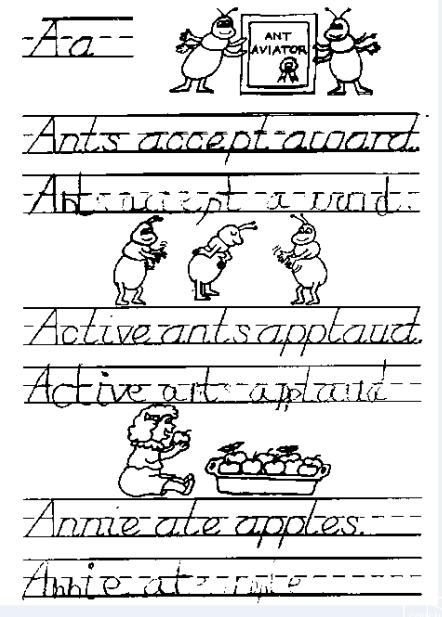
27. Cow-Dog-Shoe-Wall-Man-Car-Girl-Key-Book

Sentence Repetition (Ages 5–7) or Sentence Questions (Ages 8–17)

- 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 red greened the blue with a yellow. Who got greened?

Successive

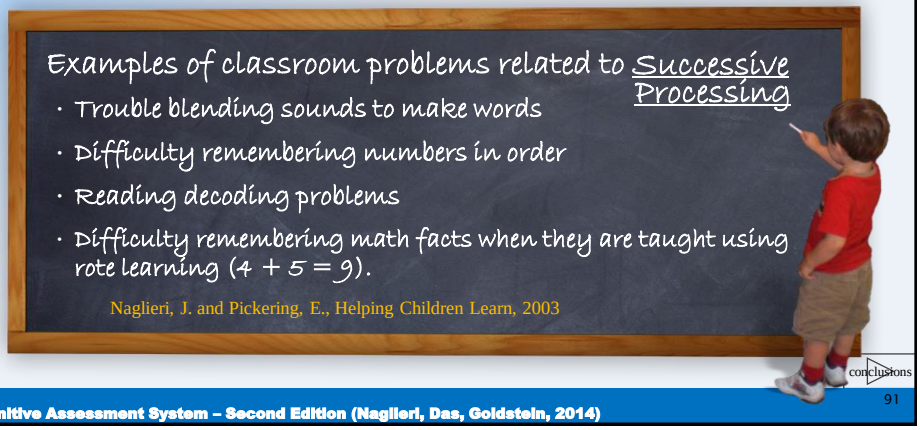
The sequence of the sounds is emphasized in this work sheet



PASS Theory: Successive

Successive Processing

- Use information in a specific order
- Follow instructions presented in sequence



Topical Outline

- Introduction to PASS measured by CAS2
- CAS2, CAS2-Brief and CAS2-Rating Scale
- PASS processes Revisited
  - PASS neurocognitive processes
- Why PASS and CAS?
  - IQ test Profiles, Race/Ethnic Differences, Intervention
- Interpretation of CAS2, CAS2: Brief, and CAS2: Rating Scale
  - Using CAS2 for Eligibility Determination
  - Using CAS2 for Academic Intervention

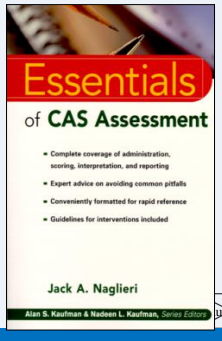
Ability Test Profiles

Do Students with SLD Have a Pattern of Cognitive Strengths and Weaknesses?

This is essential for intervention planning

Which test correlate highest with Achievement?

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



Ability & Achievement (Naglieri, 1999)

	Tests require much knowledge			Little knowledge needed	
	WISC-III FSIQ	DAS GCA	WJ-R Cog	K-ABC MPC	CAS FS
Median r	.590	.600	.625	.630	.700
% of Var	35%	36%	39%	40%	49%
Increase over WISC-III	–	3%	12%	14%	41%
N	1,284	2,400	888	2,636	1,600

WISC-3: WIAT Manual Table C.1 ages 6-16; WJ-R Technical Manual; CAS Interpretive Handbook; K-ABC Interpretative Manual; DAS Handbook. Increase = $(r^2_1 - r^2_2)/ r^2_1$ where r^2_1 = WISC-3 WIAT correlation

conclusions

Correlations with Achievement

- The 1999 study of ability test correlations with achievement was based on Full Scales
- In order to study the ability test correlations with achievement EXCLUDING the scales that clearly require knowledge
  - This is a way of correcting the correlation
- The solution was to look at the average correlations of the SCLAES with achievement with and without those scales on ability tests that are so contaminated with achievement

conclusions

Correlations with Achievement

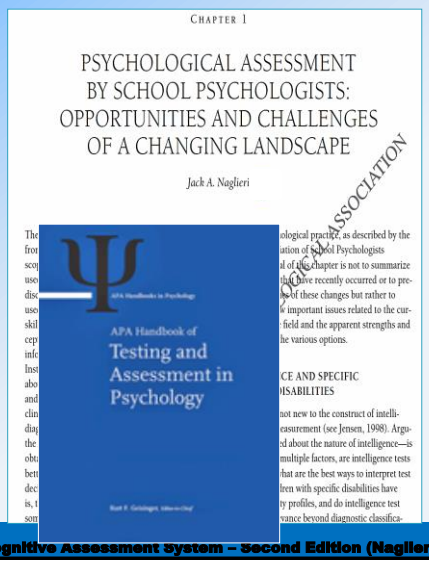
- Correlations between ability & achievement tests show the strength of measuring basic psychological processes

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	% Variance
WISC-V	Verbal Comprehension	.74			
WIAT-III	Visual Spatial	.46			
N = 201	Fluid Reasoning	.40			
	Working Memory	.63			
	Processing Speed	.34	.53	.47	.22
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	.25
KABC	Sequential/Gsm	.43			
WJ-III ACH	Simultaneous/Gv	.41			
N = 167	Learning/Glr	.50			
	Planning/Gf	.59		.48	.23
	Knowledge/GC	.70	.53		
CAS	Planning	.57			
WJ-III ACH	Simultaneous	.67			
N=1,600	Attention	.50			
	Successive	.60		.59	.35

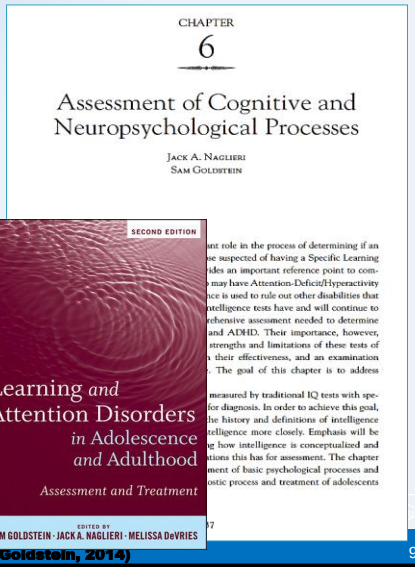
Note: WJ-IV Scales Comp-Know= Vocabulary and General Information; Fluid Reasoning = Number Series and Concept Formation; Auditory Processing = Phonological processing.

Which Ability Tests have Useful Profiles ?


CHAPTER 1

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

Jack A. Naglieri


CHAPTER 6

Assessment of Cognitive and Neuropsychological Processes

JACK A. NAGLIERI
SAM GOLDSTEIN

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

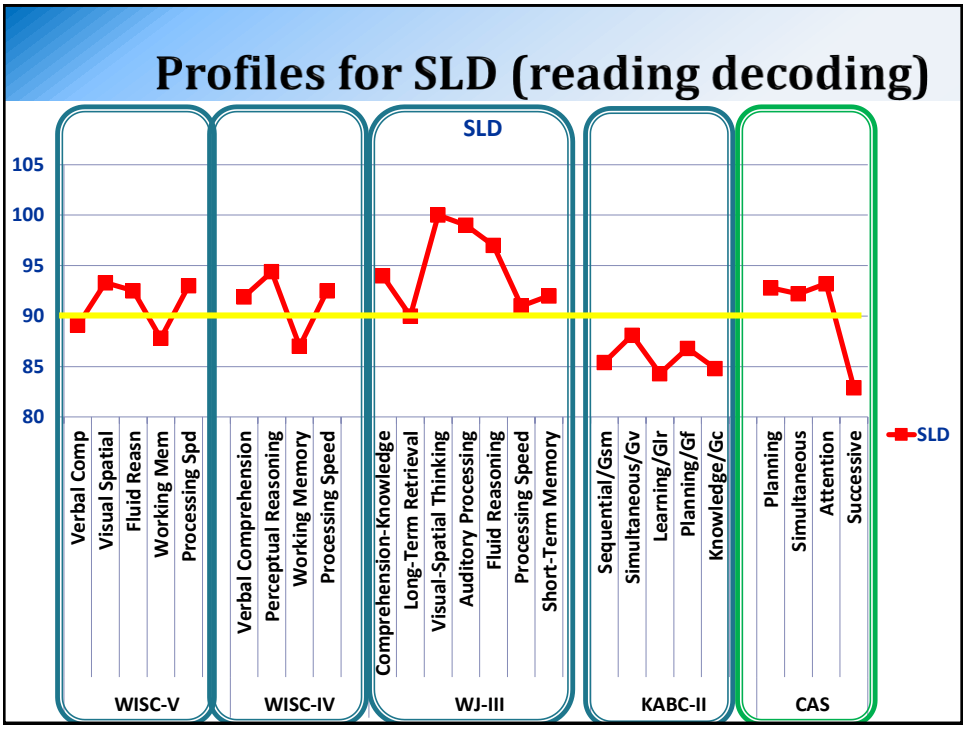
2. Subtest profile analysis is UNSUPPORTED so use scale profiles instead

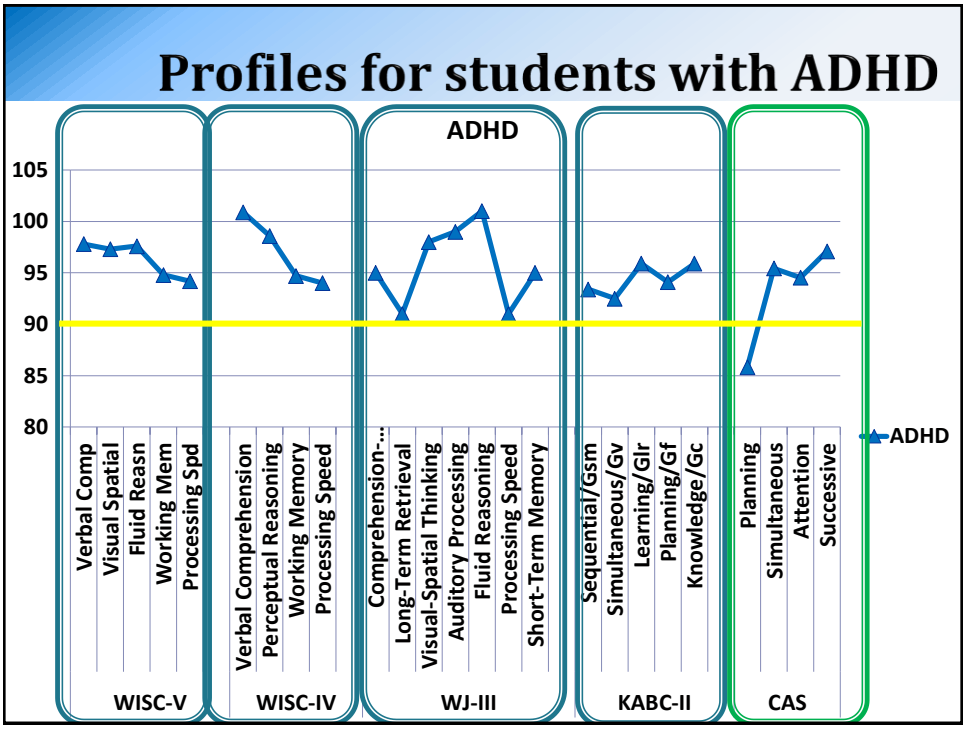
Naglieri & Goldstein (2011)

Scales should fit a theory and show mean score differences within a measure

be examined, especially if the separate scales have ample theoretical and empirical support. In the sections that follow, research on the scale profiles is presented first for those ability tests that are used for adolescents and adults, and then for those that can be used only with adolescents. The goal is not to describe these instruments; interested readers should examine their respective test manuals. Instead, the goal is to examine the mean scores of the scales from each test. This examination helps us understand if the ability test shows a particular pattern for a specific clinical group. Such information could have important implications for understanding the cognitive characteristics of that clinical group and allow for possible diagnostic and intervention considerations. These findings, however, must be taken with recognition that the samples are not matched across the various studies, the accuracy of the diagnosis may not have been verified, and some of the sample sizes may be small. Notwithstanding these limitations, the findings do provide important insights into the extent to which these various tests can be used for assessment of adolescents and adults suspected of having an SLD or attention deficit.

Limitations: different samples and accuracy of diagnostic group likely varies


Profiles for SLD (reading decoding)
SLD
105
100
95
90
85
80
Verbal Comp
Visual Spatial
Fluid Reasn
Working Mem
Processing Spd
Verbal Comprehension
Perceptual Reasoning
Working Memory
Processing Speed
Comprehension-Knowledge
Long-Term Retrieval
Visual-Spatial Thinking
Auditory Processing
Fluid Reasoning
Processing Speed
Short-Term Memory
Sequential/Gsm
Simultaneous/Gv
Learning/Glr
Planning/Gf
Knowledge/Gc
Planning
Simultaneous
Attention
Successive
WISC-V
WISC-IV
WJ-III
KABC-II
CAS
SLD


Profiles for students with ADHD
ADHD
105
100
95
90
85
80
Verbal Comp
Visual Spatial
Fluid Reasn
Working Mem
Processing Spd
Verbal Comprehension
Perceptual Reasoning
Working Memory
Processing Speed
Comprehension-...
Long-Term Retrieval
Visual-Spatial Thinking
Auditory Processing
Fluid Reasoning
Processing Speed
Short-Term Memory
Sequential/Gsm
Simultaneous/Gv
Learning/Glr
Planning/Gf
Knowledge/Gc
Planning
Simultaneous
Attention
Successive
WISC-V
WISC-IV
WJ-III
KABC-II
CAS
ADHD

Evidence for Discrepancy Consistency Model using PASS

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

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

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

Jack A. Naglieri
George Mason University

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

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

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

Journal of Psychoeducational Assessment
28(1) 19–30

DOI: 10.1177/0734282909333057
http://jpa.sagepub.com
SAGE

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

Abstract

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

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

Nine Distinct Profiles

	1	2	3	4	5	6	7	8	9
Planning	99	86	87	85	88	111	102	87	93
Simultaneous	105	103	97	96	83	102	86	101	92
Attention	102	97	80	81	91	106	99	87	96
Successive	90	85	85	97	75	89	99	103	82

Johnson, Bardos & Tayebi, 2003

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

Journal of Psychoeducational Assessment
2003, *21*, 180-195

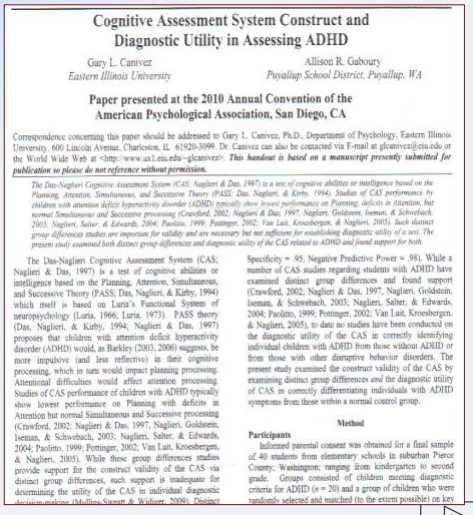
DISCRIMINANT VALIDITY OF THE COGNITIVE ASSESSMENT SYSTEM FOR STUDENTS WITH WRITTEN EXPRESSION DISABILITIES

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

This study explored the PASS cognitive processing theory in junior high students (aged 11-15 years) with and without written expression disabilities. Ninety-six students with (n = 48) and without (n = 48) written expression disabilities were administered the Das-Naglieri: Cognitive Assessment System (DN:CAS; 1997) and the writing subtests of the Wechsler Individual Achievement Test (WIAT; 1992). Discriminant analyses were utilized to identify the DN:CAS subtests and composites that contributed to group differentiation. The Planning composite was found to be the most significant contributor among the four composite scores. Subsequent efficiency of classification analyses provided strong support for the validity of the obtained discriminant functions in that the four DN:CAS composite scale scores correctly identified 83% of the students as members of their respective groups.

Canivez & Gaboury (2010)

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



Cognitive Assessment System Construct and Diagnostic Utility in Assessing ADHD

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

Correspondence concerning this paper should be addressed to Gary L. Canivez, Ph.D., Department of Psychology, Eastern Illinois University, 600 Lincoln Avenue, Charleston, IL 61920-3099. Dr. Canivez can also be contacted via E-mail at glcanivez@eiu.edu or the World Wide Web at <http://www.ux1.eiu.edu/~glcanivez>. *This handout is based on a manuscript presently submitted for publication so please do not reference without permission.*

The Das-Naglieri Cognitive Assessment System (CAS; Naglieri & Das, 1997) is a test of cognitive abilities or intelligence based on the Planning, Attention, Simultaneous, and Successive Theory (PASS; Das, Naglieri, & Kirby, 1994). Studies of CAS performance by children with attention deficit hyperactivity disorder (ADHD) typically show lowest performance on Planning, deficits in Attention, but normal Simultaneous and Successive processing (Crawford, 2002; Naglieri & Das, 1997, Naglieri, Goldstein, Iseman, & Schwebach, 2003; Naglieri, Salter, & Edwards, 2004; Paolitto, 1999; Pottinger, 2002; Van Luit, Kroesbergen, & Naglieri, 2005). Such distinct group differences studies are important for validity and are necessary but not sufficient for establishing diagnostic utility of a test. The present study examined both distinct group differences and diagnostic utility of the CAS related to ADHD and found support for both.

The Das-Naglieri Cognitive Assessment System (CAS; Naglieri & Das, 1997) is a test of cognitive abilities or intelligence based on the Planning, Attention, Simultaneous, and Successive Theory (PASS; Das, Naglieri, & Kirby, 1994) which itself is based on Luria's Functional System of neuropsychology (Luria, 1966; Luria, 1973). PASS theory (Das, Naglieri, & Kirby, 1994; Naglieri & Das, 1997) proposes that children with attention deficit hyperactivity disorder (ADHD) would, as Barkley (2003, 2006) suggests, be more impulsive (and less reflective) in their cognitive processing, which in turn would impact planning processing. Attentional difficulties would affect attention processing. Studies of CAS performance of children with ADHD typically show lowest performance on Planning with deficits in Attention but normal Simultaneous and Successive processing (Crawford, 2002; Naglieri & Das, 1997; Naglieri, Goldstein, Iseman, & Schwebach, 2003; Naglieri, Salter, & Edwards, 2004; Paolitto, 1999; Pottinger, 2002; Van Luit, Kroesbergen, & Naglieri, 2005). While these group differences studies provide support for the construct validity of the CAS via distinct group differences, such support is inadequate for determining the utility of the CAS in individual diagnostic decision-making (Mollins-Sweatt & Widiger, 2009). Distinct Specificity = .95, Negative Predictive Power = .98). While a number of CAS studies regarding students with ADHD have examined distinct group differences and found support (Crawford, 2002; Naglieri & Das, 1997, Naglieri, Goldstein, Iseman, & Schwebach, 2003; Naglieri, Salter, & Edwards, 2004; Paolitto, 1999; Pottinger, 2002; Van Luit, Kroesbergen, & Naglieri, 2005), to date no studies have been conducted on the diagnostic utility of the CAS in correctly identifying individual children with ADHD from those without ADHD or from those with other disruptive behavior disorders. The present study examined the construct validity of the CAS by examining distinct group differences *and* the diagnostic utility of CAS in correctly differentiating individuals with ADHD symptoms from those within a normal control group.

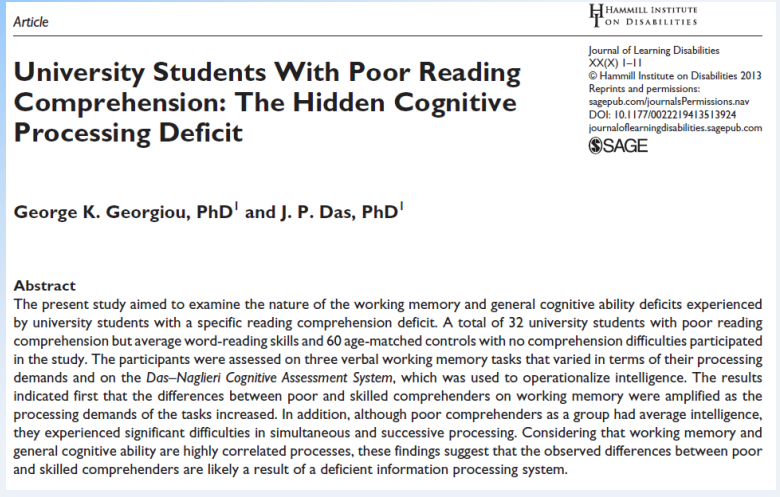
Method

Participants

Informed parental consent was obtained for a final sample of 40 students from elementary schools in suburban Pierce County, Washington; ranging from kindergarten to second grade. Groups consisted of children meeting diagnostic criteria for ADHD ($n = 20$) and a group of children who were randomly selected and matched (to the extent possible) on key

conclusions

Georgiou & Das (2013)



Article

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

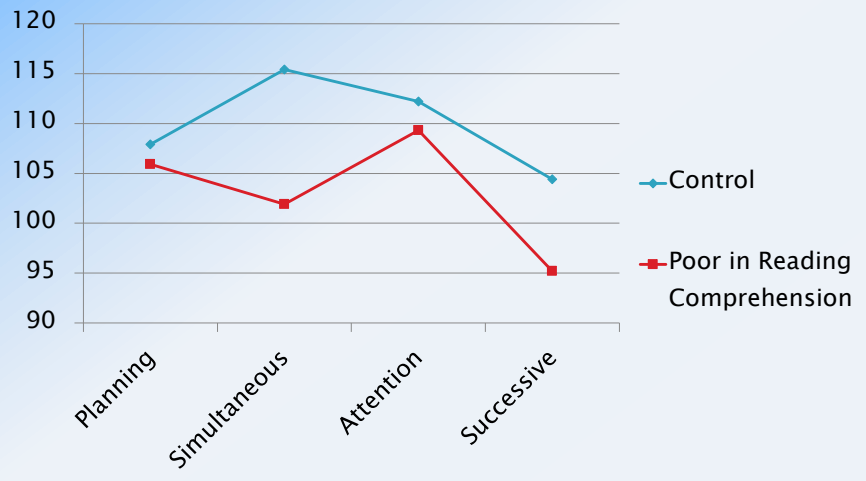
George K. Georgiou, PhD[1] and J. P. Das, PhD[1]

Abstract

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

conclusions

Georgiou & Das (2013)



conclusions

Performance Across Race, Ethnicity, Culture and Language

We must use tests that are fair to minority groups

conclusions

Which Ability tests are Non-Di

non discriminatory assessments

"(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 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;

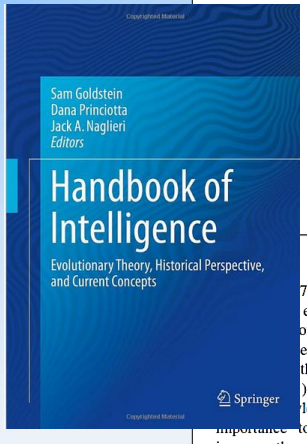
"(iv) are administered by trained and knowledgeable personnel; and

"(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 determining the educational needs of the child are provided;

Which Ability tests are Non-Discriminatory?



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

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 psycholedge 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

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

PASS psychological processes measured by CAS and CAS2 is most fair

PASS neuropsychological abilities in other languages

Naglieri, Rojahn, Matto (2007)

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

Available online at www.sciencedirect.com
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INTELLIGENCE

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

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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.
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Hispanic ELL Students with Reading Problems

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

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

English Spanish CAS

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

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

English Spanish CAS Summary

- The PASS cognitive weakness profiles on both the Spanish and English versions of the CAS were studied
- 90% of the time children had the same PASS weakness on both the English AND Spanish versions of the CAS:
  - Planning 92.7%
  - Simultaneous 89.1%
  - Attention 100%
  - Successive 78.2%

Otero, Gonzales, Naglieri (2012)

- SLD and PASS scores

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

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Psychology Press
Taylor & Francis Group

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

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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.

Otero, Gonzales, Naglieri (2012)

- "Fagan (2000) as well as Suzuki and Valencia (1997) suggested that a cognitive processing approach like that used in the CAS would avoid the knowledge base required to answer verbal and quantitative questions found on most traditional IQ tests and would be more appropriate for culturally and linguistically diverse populations. The results of this study support the assertion (p. 8)."

TABLE 2
Means, Standard Deviations, *d* Ratios, and Correlations Between the English and Spanish Versions of the Cognitive Assessment System ($N = 40$)

	CAS English		*CAS Spanish*			*Correlations*	
CAS Subtests and Scales	*M*	*SD*	*M*	*SD*	*d ratio*	*Obtained*	*Corrected*
Scales							
Planning	94.60	8.78	94.98	8.59	–0.04	.978	.997
Simultaneous	92.58	11.34	93.63	12.06	–0.09	.886	.953
Attention	94.08	8.48	94.78	8.23	–0.08	.973	.997
Successive	78.65	10.29	78.25	10.08	0.04	.943	.987
Full Scale	86.40	8.73	87.10	7.94	–0.08	.936	.993

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

*$p < .001$.

Cognitive Assessment System – Soc

International PASS Results

Van Luit, et al (2002) Dutch

- 186 Dutch Children

Utility of the PASS Theory and Cognitive Assessment System for Dutch Children With and Without ADHD

Johannes E. H. Van Luit, Evelyn H. Kroesbergen, and Jack A. Naglieri

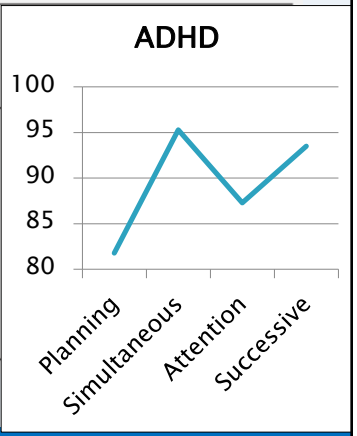
Abstract

This study examined the utility of the Planning, Attention, Simultaneous, Successive (PASS) theory of intelligence as measured by the *Cognitive Assessment System* (CAS) for evaluation of children with attention-deficit/hyperactivity disorder (ADHD). The CAS scores of 51 Dutch children without ADHD were compared to the scores of a group of 20 Dutch children with ADHD. The scores of the Dutch children were also compared to American standardization samples of children with and without ADHD. The findings showed that children with ADHD in both countries demonstrated relatively low scores on the Planning and Attention scales of the CAS, but average scores on the Simultaneous and Successive scales. These findings are similar to previously published research suggesting that the PASS theory, as operationalized by the CAS, has sensitivity to the cognitive processing difficulties found in some children with ADHD.

Van Luit, et al (2002)

TABLE 2
CAS Full Scale and Subscale Means and Standard Deviations for Dutch ADHD Group and Dutch Control Group

Scale	ADHD[a] M	ADHD[a] SD	Control[b] M	Control[b] SD
Planning	81.8	9.3	95.6	10.5
Attention	87.3	10.6	102.2	11.6
Simultaneous	95.3	13.7	101.2	12.7
Successive	93.5	14.4	103.0	13.0
Full Scale	85.7	12.9	100.4	11.1



Cognitive Assessment System – Second Edition (Naglieri, Das, Goldstein, 2014)

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

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

Cognitive Assessmen

US and Italian Samples– Mean Scores

Table 5

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

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

Note. CAS = Cognitive Assessment Syste S = Planning, Attention, Simultaneous, and Successive. U.S. sample *N*s vary due Designations for *d*-ratios are as follows: T = .2), S = small (.2), M = medium (.5), and L = large (.8). For all *F* values the *df*s a for Speech Rate (1, 1219) and Sentence 62).

Italian mean = 100.9 &US mean = 100.5

Take Away Message

- Why does PASS theory work?
  - It measures important basic neurocognitive processes
  - It does not measure ability by tests that involve academic skills, that is no vocabulary, information, arithmetic, etc.
- All traditional IQ tests with verbal and quantitative tests are contaminated by knowledge and pose threats to the validity of any ability test that includes them

Topical Outline

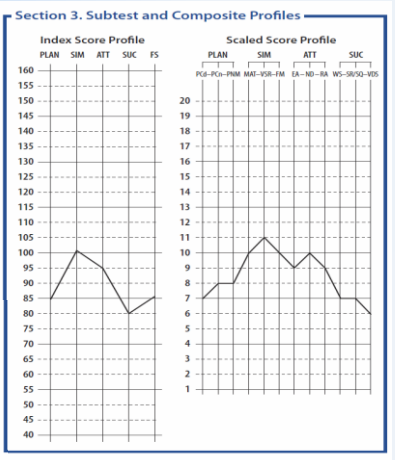
- Introduction to PASS measured by CAS2
- CAS2, CAS2-Brief and CAS2-Rating Scale
- PASS processes Revisited
  - PASS neurocognitive processes
- Why PASS and CAS?
  - IQ test Profiles, Race/Ethnic Differences, Intervention
- Interpretation of CAS2, CAS2: Brief, and CAS2: Rating Scale
  - Using CAS2 for Eligibility Determination
  - Using CAS2 for Academic Intervention

Interpretation of CAS2

Step 1- Full Scale and PASS scales
Step 2- Examine PASS scale profile
Step 3 – Examine subtest scaled scores
Step 4 – Examine Supplemental Scales
Step 5 – Comparisons of PASS scores to achievement using the Discrepancy/Consistency model

Interpretation of CAS2

Step 1 – Full Scale and PASS scales are described in relation to the norm.



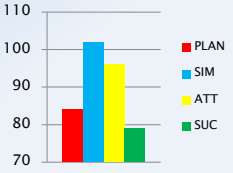
	PLAN		SIM		ATT		SUC		FS
Sum of Subtest Scaled Scores	23	+	31	+	28	+	20	=	102
PASS Composite Index Scores	84		102		96		79		87
Percentile Rank	14		55		39		8		19
95% Confidence Interval Upper	92		108		104		87		92
95% Confidence Interval Lower	79		96		89		74		83

Section 4. Descriptive Terms

Scaled Scores	1–3	4–5	6–7	8–12	13–14	15–16	17–20
Descriptive Terms	Very Poor	Poor	Below Average	Average	Above Average	Superior	Very Superior
Index Scores	<70	70–79	80–89	90–109	110–119	120–129	≥130

conclusions

Interpretation of CAS2



Step 2 – Examine PASS scale profile

Use *two* reference points – the differences from the child's mean *and* the normative mean of 100 – to determine Strength or Weakness

Section 5. CAS2 Interpretive Worksheet

PASS Scale Comparisons

Compare each PASS scale index score to the child's mean PASS score using Tables A.1 and A.2 (Extended Battery) or A.3 and A.4 (Core Battery) of the Interpretive Manual.

	Index Score	*d* value	circle .05 .10	Strength Weakness	% in sample
Planning	84	-6.3	Sig (NS)	ST (WK)	50.7
Simultaneous	102	11.7	(Sig) NS	(ST) WK	22.3
Attention	96	5.7	Sig (NS)	ST WK	53.1
Successive	79	-11.3	(Sig) NS	ST (WK)	28.0
PASS mean	90.3				

conclusions

Interpretation of CAS2

Step 3 – Examine subtest scaled scores

- This level of analysis should be very limited because subtest profile analysis has a history of being unsupported by the research
- Only interpret in unusual cases (e.g. spoiled subtest)

Subtest Analysis

Compare each subtest scaled score to the child's mean subtest score using Tables B.1 and B.2 of the Interpretive Manual.

	Scaled Score	*d* value	circle .05 .10	Strength Weakness	% in sample
Planned Codes	7	-.7	Sig (NS)	ST WK	>25
Planned Connections	8	.3	Sig (NS)	ST WK	>25
Planned Number Match	8	.3	Sig (NS)	ST WK	>25
Planning mean	7.7				

Interpretation of CAS2

Step 4 – Examine Supplemental Scales

- Make comparisons to the normative mean
- These additional scales help relate findings from CAS2 to other concepts

Supplemental Composite Scores

Subtest	Scaled Score: EF w/o WM	EF w/ WM	WM	VC	NvC
Planned Codes					7
Planned Connections	8	8			
Matrices					10
Verbal-Spatial Relations		11	11	11	
Figure Memory					10
Expressive Attention	9	9			
Receptive Attention				9	
Sentence Repetition/Questions		7	7	7	
	EF w/o WM	EF w/ WM	WM	VC	NvC
Sum of Subtest Scaled Scores	17	35	18	27	27
Composite Index Scores	91	91	94	93	92
Percentile Rank	27	27	34	32	30
Upper ____% Confidence Interval	101	99	101	101	99
Lower	84	85	88	87	86

Note: EF w/o WM = Executive Function without Working Memory; EF w/WM = Executive Function with Working Memory; WM = Working Memory; VC = Verbal Content; NvC = Nonverbal Content.

CAS2 Working Memory Scale

- The Working Memory scale is composed of…
  - Verbal-Spatial Relations and Sentence Repetition (ages 5-7 years) or Sentence Questions (ages 8-18 years) subtests.
  - Working memory has been described as the capacity of the individual to store information for a short period of time and manipulate it using a **phonological loop** and **visual-spatial sketchpad** (Baddeley & Hitch, 1974).

CAS2 Working Memory Scale

- The **visual-spatial sketchpad** has been described as *a mental image of visual and spatial features* (Engle & Conway, 1998)
- The **phonological loop** refers to *retention of information when order of information is required* (Engle & Conway, 1998)
- Because the Verbal-Spatial Relations and Sentence Repetition/Sentence Questions subtests have cognitive demands similar to those of the visual-spatial sketchpad and phonological loop, respectively, they comprise the CAS2 Working Memory scale

CAS2 EF Scales

- Theories of EF often differ in regard to the role of working memory, so in the CAS2 we have two scales for measuring EF
  - The Executive Function Without Working Memory and Executive Function With Working Memory
- Both measure the neurocognitive component of behaviors related to EF as measured by scales such as the Comprehensive Executive Function Inventory (CEFI; Naglieri & Goldstein, 2013).

CAS2 EF Scales

- The Executive Function *Without Working Memory* composite is composed of …
  - Weyandt et al. (2013) found that trail-making (Planned Connections) and Stroop (Expressive Attention) are among the most widely used measures of executive functioning.
    - Planned Connections and Expressive Attention measure shifting and inhibition (Georgiou, Das, & Hayward, 2008) and therefore they make up this EF scale

CAS2 EF Scales

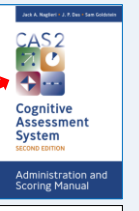
- The Executive Function *With Working Memory* scale includes the ..
  - Planned Connections, Expressive Attention, Verbal-Spatial Relations, and Sentence Repetition (ages 5–7 years) or Sentence Questions (ages 8–18 years)
  - This scale adds the working memory aspect of executive functioning that some believe is central to the concept of executive functioning (Baddeley & Hitch, 1974).

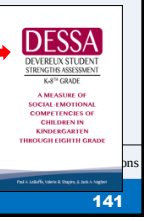
CAS2 EF Scales

- The Executive Function Scale on the CA2 provides one of three ways to evaluate this concept
  - EF Ability (CAS2)
  - EF Behaviors (CEFI)
  - EF Social Emotional Skills (DESSA)
- The combination of these three ways to address EF provides a thorough view of: "**how and whether a person goes about doing something**" (Lezak, 1995, p. 42)

Executive Function – Measured

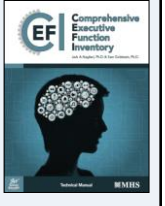
- The concept of EF should be assessed by measuring behaviors, ability, and social emotional skills:
  - EF Behaviors – *Comprehensive Executive Function Inventory* (CEFI, Naglieri & Godstein, 2014)
  - EF Ability Cognitive Assessment System – Second Edition (CAS2, Naglieri, Das & Goldstein, 2014)
  - EF Social Emotional Skills – Devereux Student Strength Assessment K–8th Grade (DESSA; LeBuffe, Sharipiro & Naglieri, 2012)

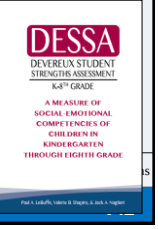




CAS2 EF Scales

- The CAS2 EF score should be compared to EF behaviors and social emotional skills using tests that have good psychometrics, especially good standardization samples
- Two measures that meet these descriptions:
  - Comprehensive Executive Function Inventory (Naglieri & Godstein, 2014)
  - Devereux Student Strength Assessment K–8th Grade (DESSA; LeBuffe, Sharipiro & Naglieri, 2012)





CAS2 Verbal

- The Verbal Content Scale is made from
  - Verbal-Spatial Relations
  - Receptive Attention (Picture or letter matching)
  - Sentence Repetition (5-7 years) or Sentence Questions (8-18 years)
- The Verbal Content scale is different from traditional verbal IQ tests because there are no vocabulary or word analogies items
- It is a measure of cognitive processing of linguistic content that is not contaminated by knowledge

CAS2 Nonverbal

- The Nonverbal scale is composed of
  - Matrices
  - Figure Memory
  - Planned Codes
- This scale provides a measure of cognitive processing within a non-linguistic context that included three of the four PASS constructs
  - Most nonverbal test scores only involve Simultaneous processing

CAS2 Visual Auditory Comparison

- **Word Series**
  - Verbal presentation of high imagery single syllable words
  - Word lengths vary from 2 to 9
- **Visual Digit Span**
  - Visual presentation of the numbers 1 through 9 with oral response
  - Number lengths vary from 2 to 9
- Both subtests require Successive processing but they differ by the type of presentation
- A 3 point difference is significant

Cumulative Percentages of the Standardization Sample Obtaining Difference Scores Between Subtests

Table B.4

Discrepancy	WS–VDS
>13	0.1
13	0.1
12	0.4
11	0.5
10	0.8
9	1.3
8	2.5
7	4.4
6	7.7
5	14.3
4	26.1
3	41.4
2	61.7
1	85.5
0	100.0
Mean	2.5
SD	2.1
Median	2.0

Visual–Auditory Comparison

	Scaled Score
Word Series	11
Visual Digit Span	10
Difference (ignore sign)	1
Circle one: .05 .10 (NS)	

conclusions

CAS2 Visual Auditory Comparison

- When we suspect a child differs across modality, we usually are comparing visual tests (e.g., Block Design) to auditory tests (Digit Span) that not only differ on modality but they differ on PASS processes (Simultaneous and Successive, respectively)
- The CAS2 Visual/Auditory Comparison provides a way to compare modality across one PASS neurocognitive Process (Successive)
  - Word Series (Auditory) vs Visual Digit Span

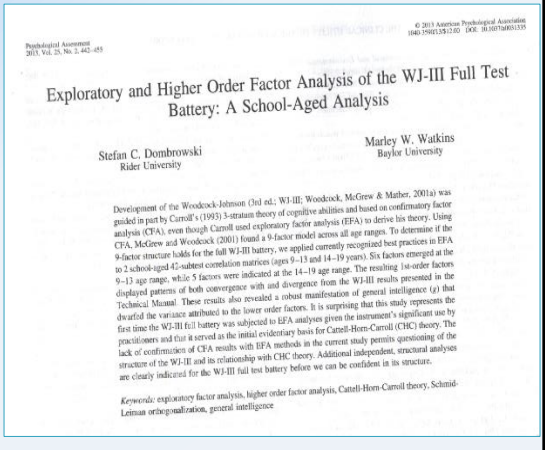
conclusions

Should selected CAS2 Subtests be used in a Cross Battery Approach?

The simple answer…NO because you need all for PASS to really understand a students strengths and weaknesses

Should CAS2 Subtests be used in a Cross Battery Approach?

- "Overall, our results diverge from the nine factor model posited in the WJ-III Manual…
- Interpretation beyond g is not recommended
- **Subtest analysis should not be conducted**



Psychological Assessment
2013, Vol. 25, No. 2, 442–455

Exploratory and Higher Order Factor Analysis of the WJ-III Full Test Battery: A School-Aged Analysis

Stefan C. Dombrowski
Rider University

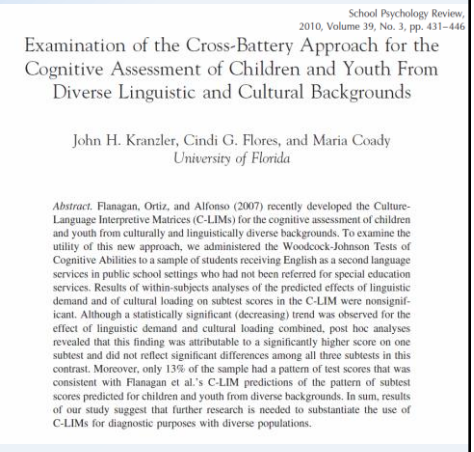
Marley W. Watkins
Baylor University

Development of the Woodcock-Johnson (3rd ed.; WJ-III; Woodcock, McGrew & Mather, 2001a) was guided in part by Carroll's (1993) 3-stratum theory of cognitive abilities and based on confirmatory factor analysis (CFA), even though Carroll used exploratory factor analysis (EFA) to derive his theory. Using CFA, McGrew and Woodcock (2001) found a 9-factor model across all age ranges. To determine if the 9-factor structure holds for the full WJ-III battery, we applied currently recognized best practices in EFA to 2 school-aged 42-subtest correlation matrices (ages 9–13 and 14–19 years). Six factors emerged at the 9–13 age range, while 5 factors were indicated at the 14–19 age range. The resulting 1st-order factors displayed patterns of both convergence with and divergence from the WJ-III results presented in the Technical Manual. These results also revealed a robust manifestation of general intelligence (g) that dwarfed the variance attributed to the lower order factors. It is surprising that this study represents the first time the WJ-III full battery was subjected to EFA analyses given the instrument's significant use by practitioners and that it served as the initial evidentiary basis for Cattell-Horn-Carroll (CHC) theory. The lack of confirmation of CFA results with EFA methods in the current study permits questioning of the structure of the WJ-III and its relationship with CHC theory. Additional independent, structural analyses are clearly indicated for the WJ-III full test battery before we can be confident in its structure.

Keywords: exploratory factor analysis, higher order factor analysis, Cattell-Horn-Carroll theory, Schmid-Leiman orthogonalization, general intelligence

Should CAS2 Subtests be used in a Cross Battery Approach?

- "results of our study **do not substantiate the use of Culture-Language Interpretive Matrices (C-LIMs)** for the assessment of cognitive abilities for children and youth from diverse backgrounds, at least for the WJIII.



School Psychology Review,
2010, Volume 39, No. 3, pp. 431–446

Examination of the Cross-Battery Approach for the Cognitive Assessment of Children and Youth From Diverse Linguistic and Cultural Backgrounds

John H. Kranzler, Cindi G. Flores, and Maria Coady
University of Florida

Abstract. Flanagan, Ortiz, and Alfonso (2007) recently developed the Culture-Language Interpretive Matrices (C-LIMs) for the cognitive assessment of children and youth from culturally and linguistically diverse backgrounds. To examine the utility of this new approach, we administered the Woodcock-Johnson Tests of Cognitive Abilities to a sample of students receiving English as a second language services in public school settings who had not been referred for special education services. Results of within-subjects analyses of the predicted effects of linguistic demand and of cultural loading on subtest scores in the C-LIM were nonsignificant. Although a statistically significant (decreasing) trend was observed for the effect of linguistic demand and cultural loading combined, post hoc analyses revealed that this finding was attributable to a significantly higher score on one subtest and did not reflect significant differences among all three subtests in this contrast. Moreover, only 13% of the sample had a pattern of test scores that was consistent with Flanagan et al.'s C-LIM predictions of the pattern of subtest scores predicted for children and youth from diverse backgrounds. In sum, results of our study suggest that further research is needed to substantiate the use of C-LIMs for diagnostic purposes with diverse populations.

conclusions

CAS2 Brief (Ages 4 – 18)

- interpretation

CAS2 Brief Interpretation

- Average internal reliability coefficients across ages 4 – 18 are strong
- Total Score reliability across the ages is .94

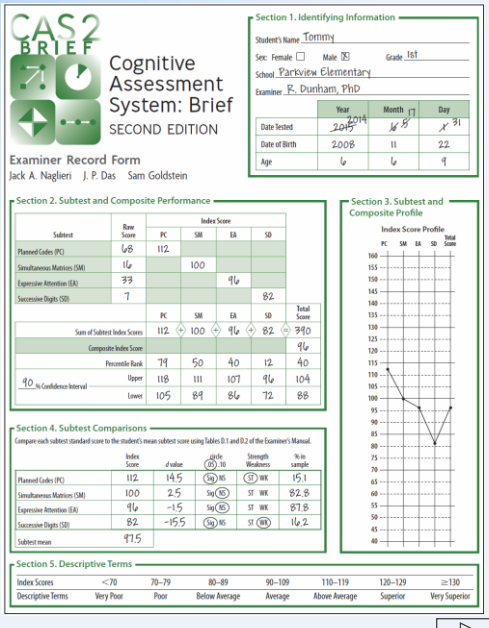
Table 5.1 Coefficient Alphas for CAS2: Brief Scores at 15 Age Intervals

	Subtest				Composite
Age (in years)	Planned Codes	Simultaneous Matrices	Expressive Attention[a]	Successive Digits	Total Score
4	.89	.84	.96	.84	.94
5	.91	.86	.91	.86	.94
6	.92	.88	.93	.88	.95
7	.94	.89	.91	.81	.94
8	.96	.89	.81	.87	.94
9	.93	.87	.86	.89	.94
10	.88	.87	.80	.83	.91
11	.95	.90	.88	.88	.95
12	.93	.87	.88	.84	.93
13	.91	.89	.83	.86	.93
14	.97	.91	.92	.88	.96
15	.96	.88	.90	.80	.94
16	.94	.90	.94	.85	.95
17	.93	.91	.90	.87	.95
18	.92	.89	.86	.85	.93
Average[b]	.93	.88	.89	.86	.94

conclusions

Interpretation

- PASS scales are compared to the child's mean and to the national norm
- Because each scale has only one subtest, the results should be used for screening not eligibility determination


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 F. Dunham, PhD

	Year	Month	Day
Date Tested	2015 2014	10 5	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

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/.01)	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	81.8
Successive Digits (SD)	82	-15.5	Sig NS	ST WK	14.2
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

conclusions

CAS2 Rating Scale (Ages 4 – 18)

- interpretation

CAS2: Rating Scale

- Average internal reliability coefficients across ages 4 – 18 are strong
- Total Score reliability across the ages is .98

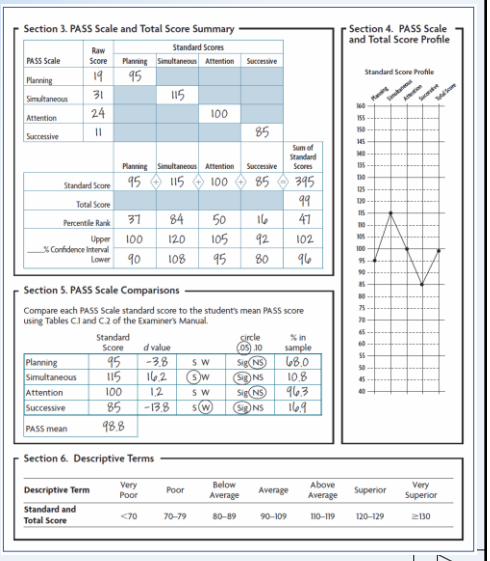
Table 4.1 Coefficient Alphas for CAS2: Rating Scale Scores at 15 Age Intervals

CAS2: Rating Scale value	Age (in years) 4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	Average[a]
PASS scales																
Planning	.88	.93	.95	.94	.86	.95	.97	.97	.96	.95	.96	.96	.96	.96	.97	.95
Simultaneous	.91	.87	.90	.93	.88	.89	.96	.92	.90	.91	.94	.97	.96	.92	.96	.93
Attention	.95	.96	.97	.95	.94	.97	.97	.98	.97	.97	.97	.97	.98	.98	.97	.96
Successive	.88	.86	.93	.94	.79	.97	.96	.96	.96	.94	.93	.95	.95	.94	.93	.94
Total Score	.96	.98	.98	.95	.98	.99	.99	.98	.98	.98	.98	.98	.99	.98	.98	.98

[a]Fisher's average of alpha coefficients across all ages.

CAS2: Rating Scale

- PASS scales are compared to the child's mean and to the national norm
- Interpret results in conjunction with CAS2 or CAS2: Brief to explain *behaviors* related to PASS constructs



Section 3. PASS Scale and Total Score Summary

PASS Scale	Raw Score	Standard Scores: Planning	Simultaneous	Attention	Successive
Planning	19	95			
Simultaneous	31		115		
Attention	24			100	
Successive	11				85

	Planning	Simultaneous	Attention	Successive	Sum of Standard Scores
Standard Score	95	115	100	85	395
Total Score					99
Percentile Rank	37	84	50	16	47
___% Confidence Interval Upper	100	120	105	92	102
___% Confidence Interval Lower	90	108	95	80	96

Section 4. PASS Scale and Total Score Profile

Standard Score Profile

Planning, Simultaneous, Attention, Successive, Total Score

Section 5. PASS Scale Comparisons

Compare each PASS Scale standard score to the student's mean PASS score using Tables C.1 and C.2 of the Examiner's Manual.

	Standard Score	d value		circle (.05) .10	% in sample
Planning	95	-3.8	S W	Sig NS	68.0
Simultaneous	115	16.2	(S) W	Sig NS	10.8
Attention	100	1.2	S W	Sig NS	96.3
Successive	85	-13.8	S (W)	Sig NS	16.9
PASS mean	98.8				

Section 6. Descriptive Terms

Descriptive Term	Very Poor	Poor	Below Average	Average	Above Average	Superior	Very Superior
Standard and Total Score	<70	70–79	80–89	90–109	110–119	120–129	≥130

conclusions

CAS2: Rating Scale

- Note, that the CAS2: Rating Scale provides a measure of BEHAVIORS related to PASS
  - The Planning and Attention scores (EF measures) may be different from the behaviors related to these neurocognitive processes because of the environmental influences (e.g., schooling)

conclusions

Topical Outline

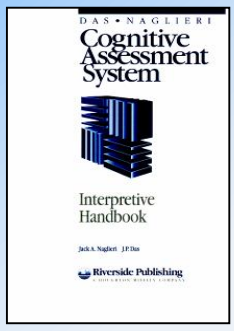
- Introduction to PASS measured by CAS2
- CAS2, CAS2-Brief and CAS2-Rating Scale
- PASS processes Revisited
  - PASS neurocognitive processes
- Why PASS and CAS?
  - IQ test Profiles, Race/Ethnic Differences, Intervention
- Interpretation of CAS2, CAS2: Brief, and CAS2: Rating Scale
  - Using CAS2 for Eligibility Determination
  - Using CAS2 for Academic Intervention

Using PASS Theory and CAS2 Tests for Eligibility Determination

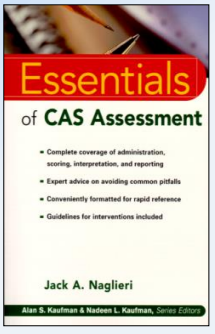
» Discrepancy/Consistency Model

PASS Discrepancy Consistency Model

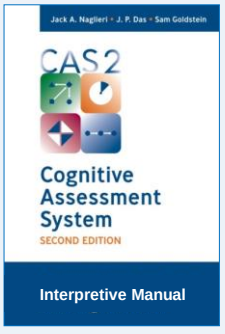
1997



1999



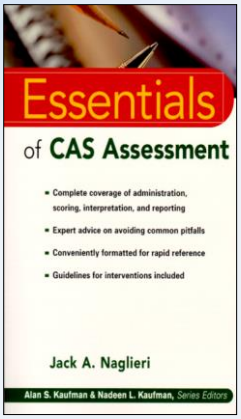
2014



Naglieri, J. A. (2011). The discrepancy/consistency approach to SLD identification using the PASS theory. In D. P. Flanagan & V. C. Alfonso (Eds.), *Essentials of Specific Learning Disability Identification (145-172)*. Hoboken, NJ: Wiley.

Discrepancy Consistency Model for SLD

Naglieri, J. A. (2011). The discrepancy/consistency approach to SLD identification using the PASS theory. In D. P. Flanagan & V. C. Alfonso (Eds.), *Essentials of Specific Learning Disability Identification (145-172)*. Hoboken, NJ: Wiley.



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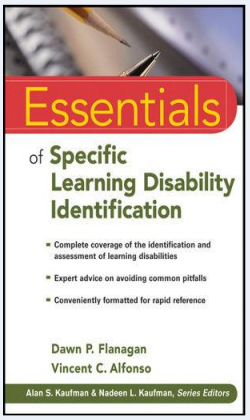
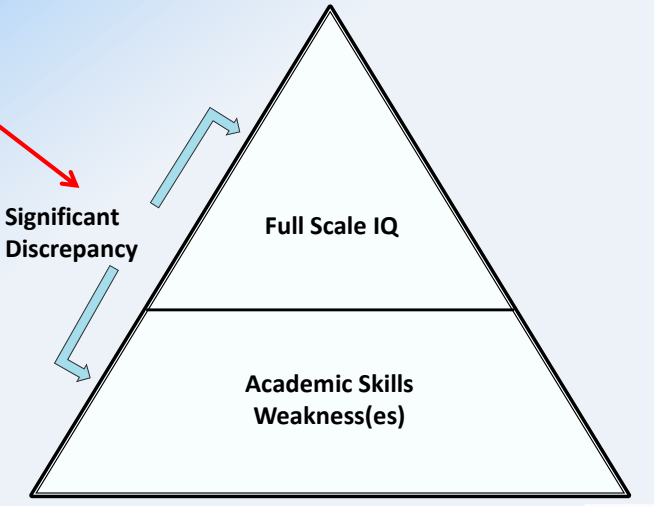


2010

Old Discrepancy Model for SLD

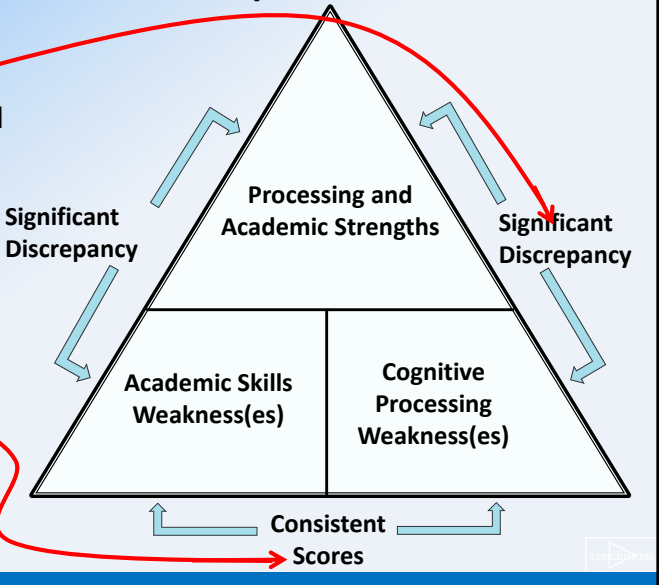
- **Discrepancy between Full Scale IQ and achievement test scores of some magnitude determined by each State Department of Education**



Cognitive Assessment System – Second Edition (Naglieri, Das, Goldstein, 2014)

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

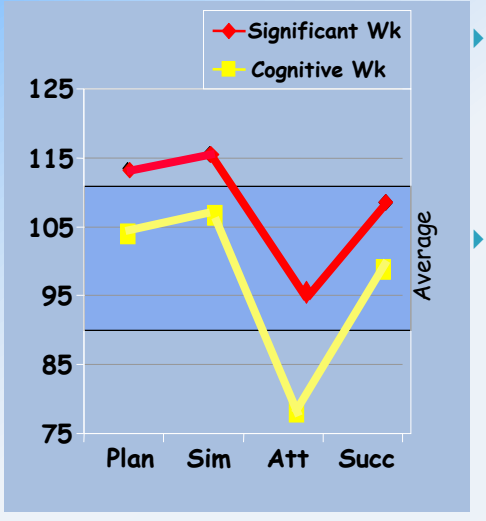


Cognitive Assessment System – Second Edition (Naglieri, Das, Goldstein, 2014)

What is a 'disorder in processing'

- Use the Discrepancy Consistency Model to identify a "*disorder in one or more of the basic psychological processes*"
  - Identify a **weakness** with otherwise average or above scores in **basic psychological processes** along with academic failure
  - A disorder should have **two** components
    - A score on a multi-dimensional measure of processes that is significantly lower than the student's average
    - The low score(s) need to be at least below the Average range (e.g., less than 90)

What is a 'disorder in processing'



- **Significant Weakness**
  - *Is low relative* to the child's mean score
- **Cognitive Weakness**
  - Is a Significant weakness and the score falls in the Low Average range (80–89) or lower

CAS2 scores to Achievement

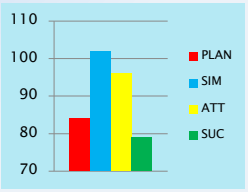
- Compare CAS2 scores to Achievement
- Values needed for comparison of CAS2 scores to any other score (Mn = 100, SD = 15)
- Table 2.3 provides differences for the CAS2 Core Battery

Table 2.2 Differences Required for Significance Using the Simple-Difference Method for Comparing CAS2 Extended Battery PASS and Full Scale Index Scores to Achievement Scores

	CAS2 Extended Battery									
	$p = .05$					$p = .01$				
Achievement test reliability	Planning	Simultaneous	Attention	Successive	Full Scale	Planning	Simultaneous	Attention	Successive	Full Scale
0.75	17	16	17	17	16	22	22	23	22	20
0.76	17	16	17	17	15	22	21	23	22	20
0.77	16	16	17	16	15	22	21	22	22	20
0.78	16	16	17	16	15	21	20	22	21	19
0.79	16	15	16	16	14	21	20	22	21	19
0.80	16	15	16	16	14	20	20	21	20	19
0.81	15	15	16	15	14	20	19	21	20	18
0.82	15	14	16	15	13	20	19	20	20	18
0.83	15	14	15	15	13	19	19	20	19	17
0.84	14	14	15	14	13	19	18	20	19	17
0.85	14	13	15	14	12	19	18	19	19	16
0.86	14	13	14	14	12	18	17	19	18	16
0.87	13	13	14	13	12	18	17	19	18	15
0.88	13	12	14	13	11	17	16	18	17	15
0.89	13	12	13	13	11	17	16	18	17	14
0.90	12	12	13	12	11	16	15	17	16	14
0.91	12	11	13	12	10	16	15	17	16	13
0.92	12	11	12	12	10	15	14	16	15	13
0.93	11	11	12	11	9	15	14	16	15	12
0.94	11	10	12	11	9	14	13	15	14	12
0.95	11	10	11	11	8	14	13	15	14	11
0.96	10	9	11	10	8	13	12	14	13	10
0.97	10	9	11	10	7	13	12	14	13	9
0.98	9	8	10	9	7	12	11	13	12	9
0.99	9	8	10	9	6	12	10	13	12	8

conclusions

Interpretation of CAS2



Apply Discrepancy/Consistency model

In this example there is a discrepancy between the Successive score of 79 and the PASS mean of 90.3

Section 5. CAS2 Interpretive Worksheet

PASS Scale Comparisons

Compare each PASS scale index score to the child's mean PASS score using Tables A.1 and A.2 (Extended Battery) or A.3 and A.4 (Core Battery) of the Interpretive Manual.

	Index Score	*d* value	circle .05 .10	Strength Weakness	% in sample
Planning	84	-6.3	Sig (NS)	ST WK	50.7
Simultaneous	102	11.7	(Sig) NS	(ST) WK	22.3
Attention	96	5.7	Sig (NS)	ST WK	53.1
Successive	79	-11.3	(Sig) NS	ST (WK)	28.0
PASS mean	90.3				

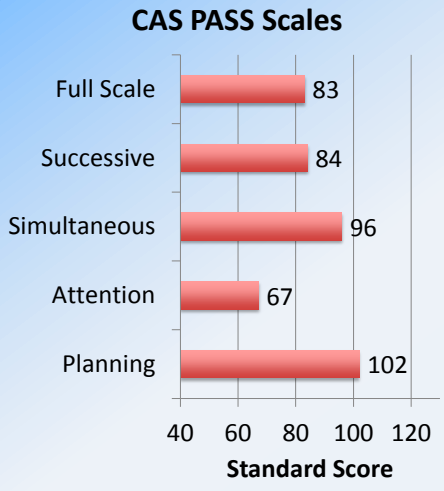
conclusions

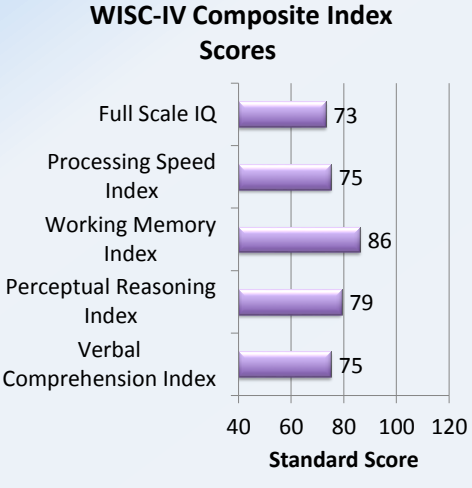
The Case of Alejandro–Discrepancy Consistency Model example

From assessment to intervention

conclusions

COGNITIVE ASSESSMENT

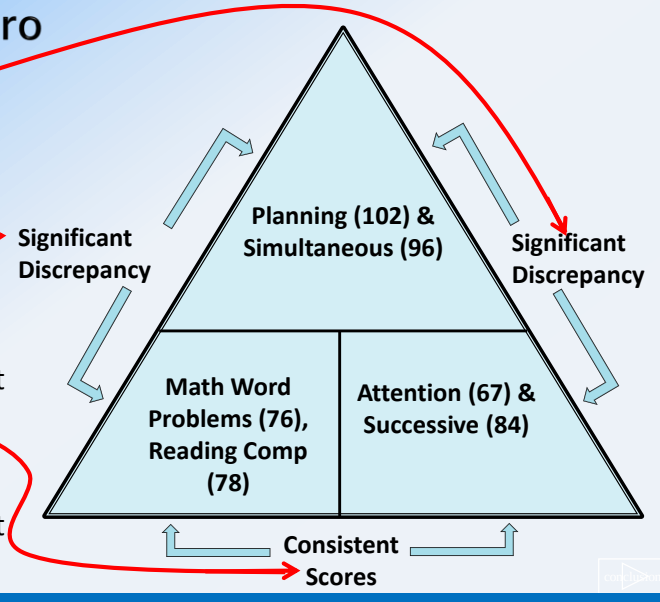




conclusions

Discrepancy Consistency Model for SLD for Alejandro

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



Documenting a 'disorder in processing'

- CAS2 Extended Battery or CAS2 Basic Battery is most appropriate for identifying a 'disorder in one or more of the basic psychological processes' included in IDEA
- CAS2 Rating Scale gives information about the behaviors related to PASS but CAS2 results are best suited for eligibility determination
- CAS2 Rating Scale and CAS2: Brief could be used at a Tier 2 screening tool

Discrepancy Consistency Model

- For eligibility determination
- For diagnosis
- For understanding
- SKIP DOE Rules
- State Department of Education Rules
  - California
  - Maryland
  - Minnesota
  - Virginia

Topical Outline

- Introduction to PASS measured by CAS2
- CAS2, CAS2-Brief and CAS2-Rating Scale
- PASS processes Revisited
  - PASS neurocognitive processes
- Why PASS and CAS?
  - IQ test Profiles, Race/Ethnic Differences, Intervention
- Interpretation of CAS2, CAS2: Brief, and CAS2: Rating Scale
  - Using CAS2 for Eligibility Determination
  - Using CAS2 for Academic Intervention

Intervention

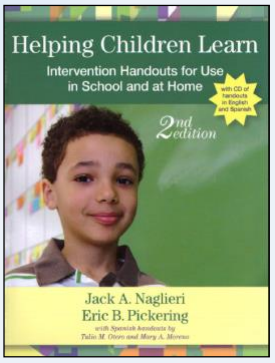
- There has been a tremendous efforts to use traditional IQ tests to guide instruction
- There have been many attempts but research has shown that traditional IQ tests do not aid in instructional planning
- Kaufman and Kaufman stressed intervention with the publication of the K-ABC in 1983
- Naglieri and Das further stressed intervention with the publication of the CAS in 1997 and CAS2 (Naglieri, Das & Goldstein, 2014)

Intervention

- In order to obtain information from that has relevance to instruction…
  - The ability test must be different from traditional verbal/quantitative/nonverbal
  - A cognitive processing perspective should be used
  - A THEORY of ability based on neuropsychological understanding of the brain should be used
  - Research which supports the connection between scores on the test with instruction must be provided

Intervention Examples

From Helping Children Learn Second Edition (Naglieri & Pickering, 2009)



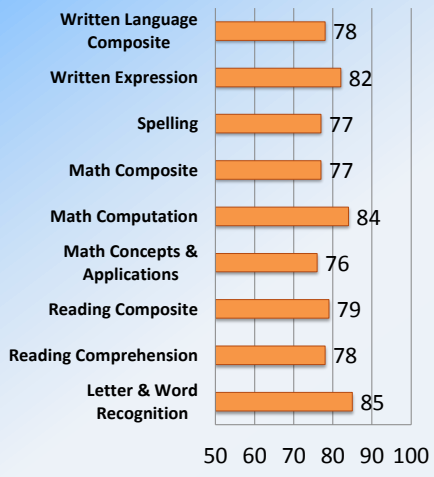
conclusions

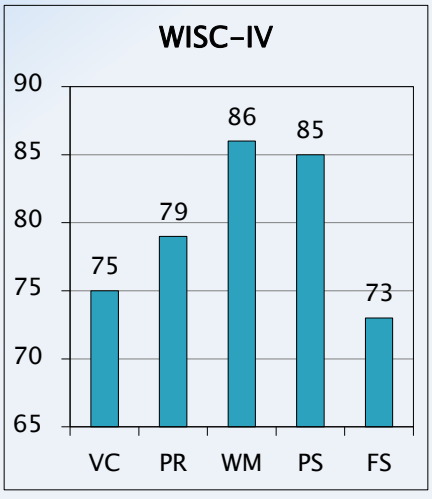
The Case of Alejandro–Discrepancy Consistency Model example

From assessment to intervention

conclusions

Alejandro's Results

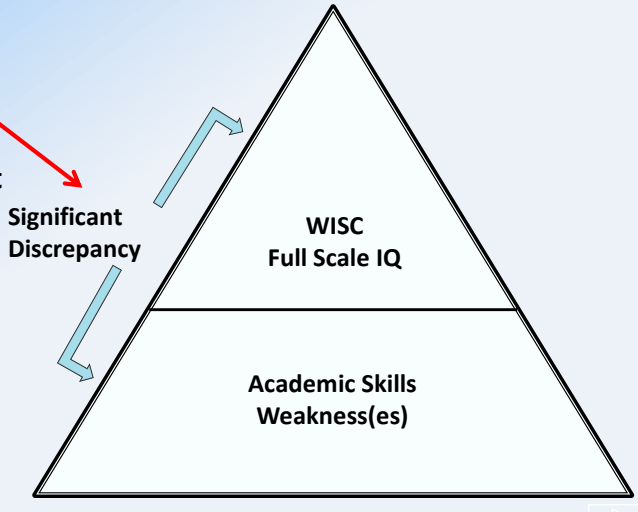




Cognitive Assessment System – Second Edition (Naglieri, Das, Goldstein, 2014)

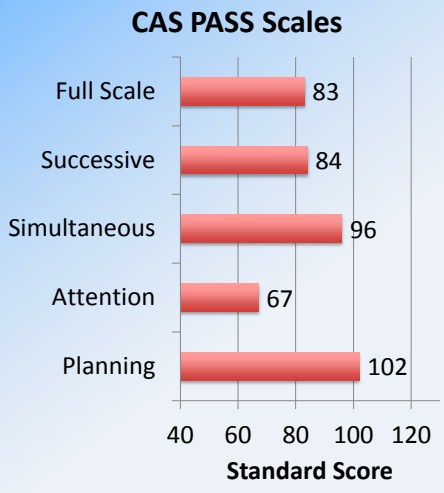
Old Discrepancy Model for SLD

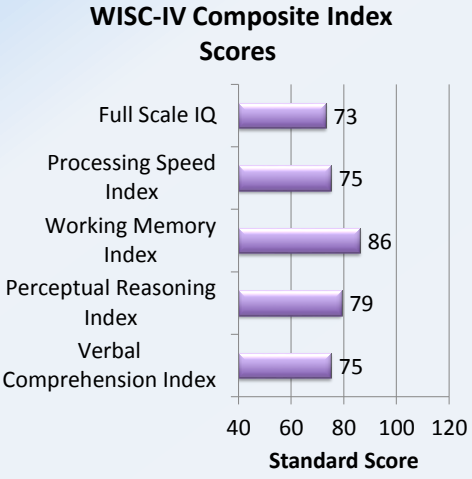
- Discrepancy between Full Scale IQ and achievement test scores of some magnitude determined by each State Department of Education



Cognitive Assessment System – Second Edition (Naglieri, Das, Goldstein, 2014)

COGNITIVE ASSESSMENT



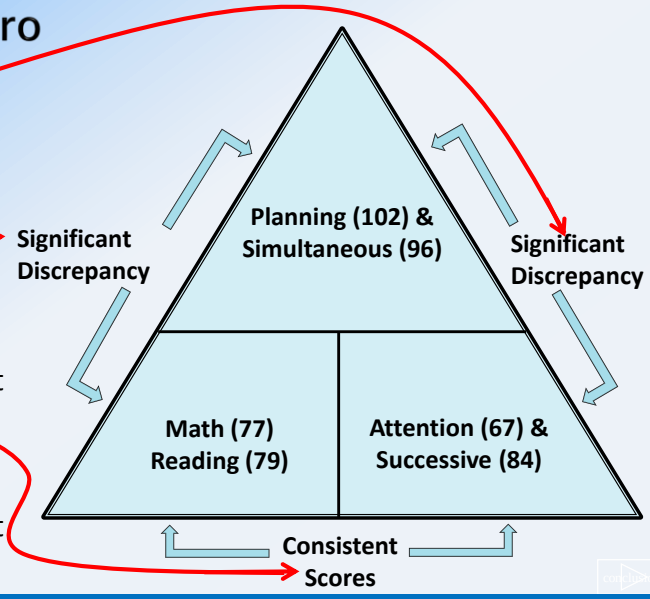


conclusions

Cognitive Assessment System – Second Edition (Naglieri, Das, Goldstein, 2014)

Discrepancy Consistency Model for SLD for Alejandro

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



Cognitive Assessment System – Second Edition (Naglieri, Das, Goldstein, 2014)

What is a 'disorder in processing'

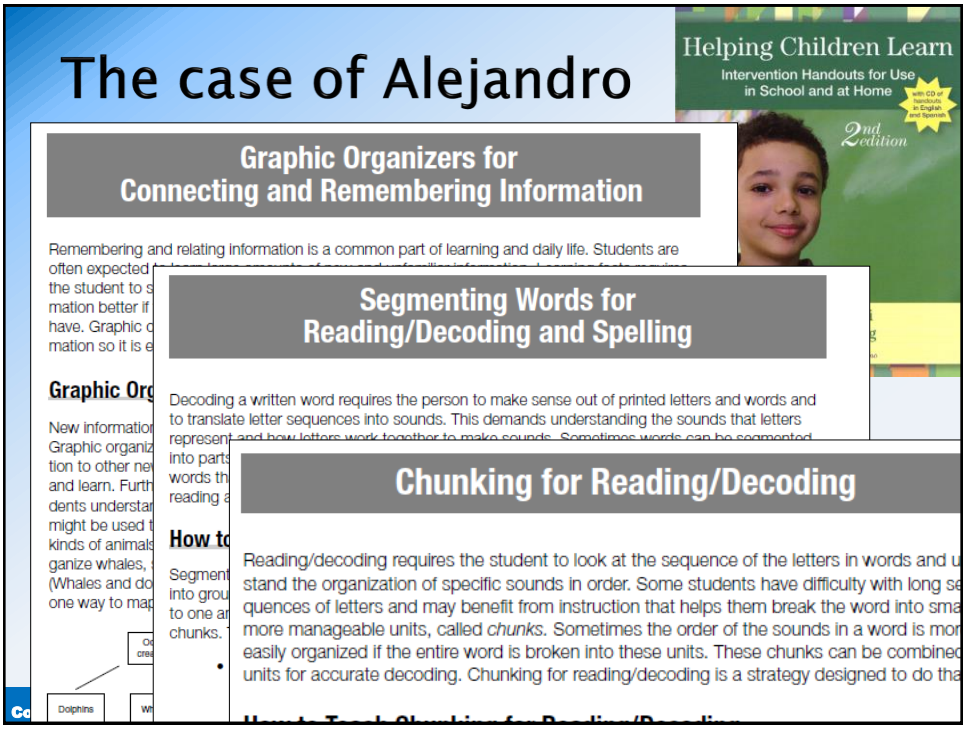
- Use the Discrepancy Consistency Model to identify a "*disorder in one or more of the basic psychological processes*"
  - Identify a **weakness** with otherwise average or above scores in **basic psychological processes** along with academic failure
  - A disorder should have **two** components
    - A score on a multi-dimensional measure of processes that is significantly lower than the student's average
    - The low score(s) need to be at least below the Average range (e.g., less than 90)

The case of Alejandro

- Alejandro has a "disorder in one or more of the basic psychological processes"
  - Attention = 67
  - Successive = 84
  - Simultaneous = 96, Planning = 102
- He has documented academic failure
- He has intra-individual differences in cognitive processes that underlie his academic problems

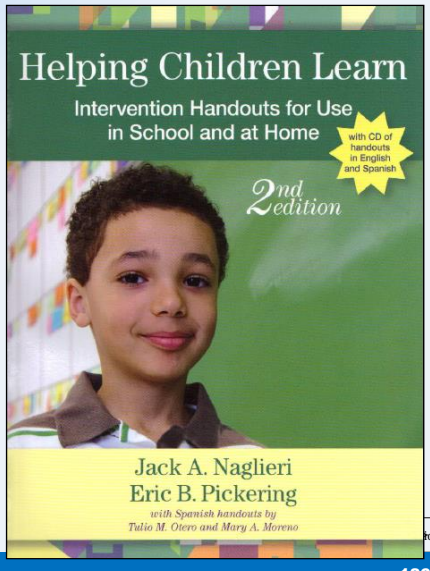
Academic Interventions

The case of Alejandro



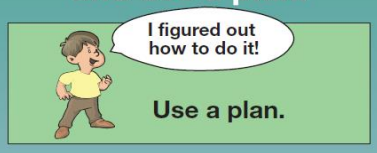
Teach Children about their Abilities

- 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.



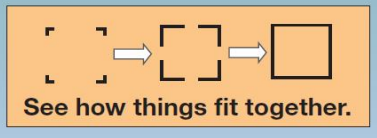
Four Ways to Think Smart!

Think smart and use a plan!

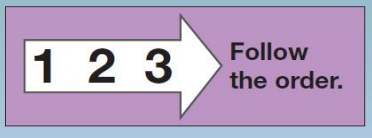


Think smart and look at the details!

Think smart and put the pieces together!



Think smart and follow the sequence!



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.

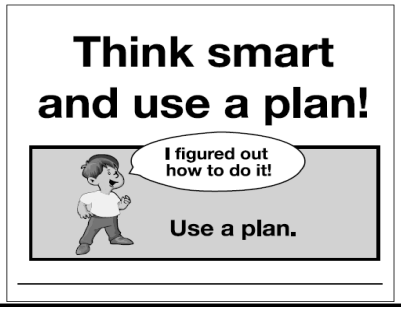
Step 1 – Talk with Students

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!

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.

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.

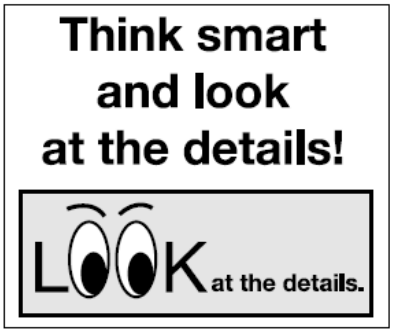


Figure 1. Picture reminder to attend to the details.

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.

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.

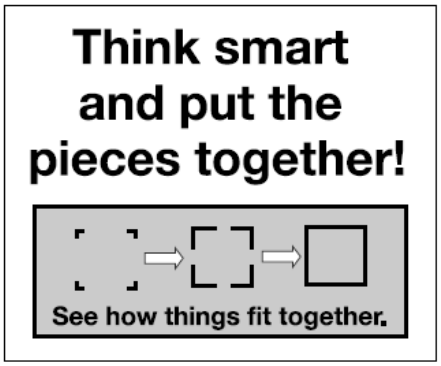


Figure 1. Picture for remembering to see the big picture.

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-

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.

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!

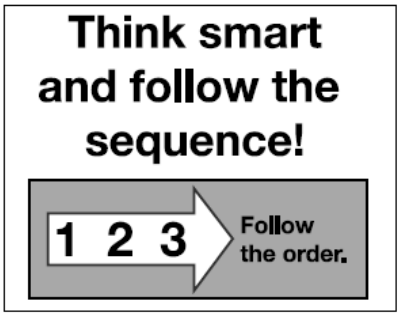
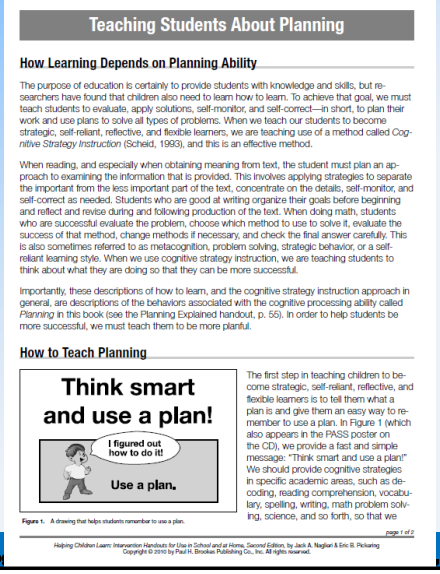


Figure 1. Picture for remembering to follow the sequence.

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!

Step 1 – How to Teach about Planning



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

teach children to approach *all* of their work with a plan (Pressley & Woloshyn, 1995). The parent or teacher should facilitate the use of strategies so that the student learns self-regulated strategy development and use.

Parents and teachers should only provide as much help to the child as needed and avoid teaching the child to rely on the adult for the solution. Because our goal is self-reliance, we have to carefully guide and encourage the child so that he or she can figure out how to solve problems without always depending on the teacher for the answers. Throughout the day, the teacher should

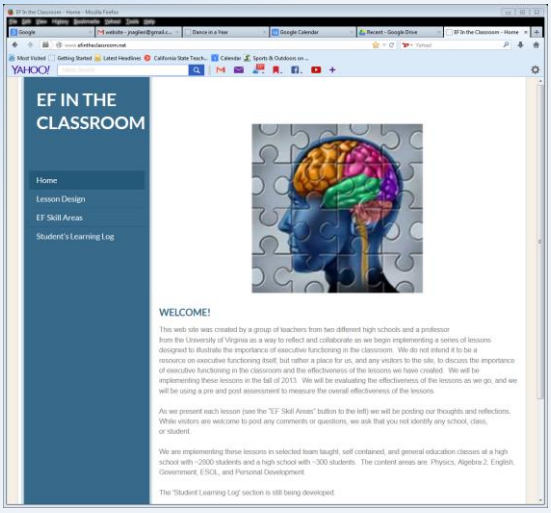
1. Teach children that a plan is a way to do something.
2. Encourage children by asking, "What is your plan?" or "Did you use a plan?"
3. Remind students to think of a strategy. If needed, provide one and explain when and where to use it.
4. Teach a limited number of strategies and encourage students to develop their own.
5. Teach strategy use in all areas of the curriculum.
6. Teach children that using a plan is also important in social situations, especially in sports, on the playground, and when playing many kinds of games.
7. Remind students that using a plan requires thoughtful examination of the problem, not rapid task completion.
8. Teach students to examine each problem carefully and always use a plan.

Resources

Pressley, M.P., & Woloshyn, V. (1995). *Cognitive strategy instruction that really improves children's academic performance* (2nd ed.). Brookline, MA: Brookline Books.
Scheid, K. (1993). *Helping students become strategic learners*. Brookline, MA: Brookline Books.

www.efintheclassroom.net

- **Start with Awareness of thinking about thinking**



conclusions

EF Lesson Plan

- *Presentation of the Theme* – Students are given a task to do or video to what that provides a stimulus about the theme related to a specific executive functioning skill.
  - This activity and the resulting discussion will engage them in the learning process
- *Discussion* is facilitated by the teacher – This means getting the students to think about the message
  - Teacher encourages a discussion about the theme (what it means, is it important, how might this help you do better, etc).
  - The teacher could present or ask the students to provide other examples related to the theme
- *Reflection Period* –
  - The teacher presents a summary of what was said and what was learned.
  - The students might make an entry in their EF DIARY about what they learned
- After this session, the students should be reminded about the theme whenever appropriate

conclusions

EF Lesson Plan Logistics

1. The EF sessions cover a theme about how to think when working in or out of the classroom
2. Seat students so that conversation will be facilitated (e.g., in a circle)
3. 30 minute sessions should be intereactive

conclusions

EF Lesson Plan Logistics

1. At the start of the week, teachers ***facilitate*** the discussion beginning with some kind of an illustration of a ***theme***.
2. The discussion should emphasize the theme which the students are reminded about from that point on.
3. The theme can be entered into a notebook and/or placed someone visible in the classroom
4. At the end of the week there is another discussion about the ***theme*** and how it influenced them

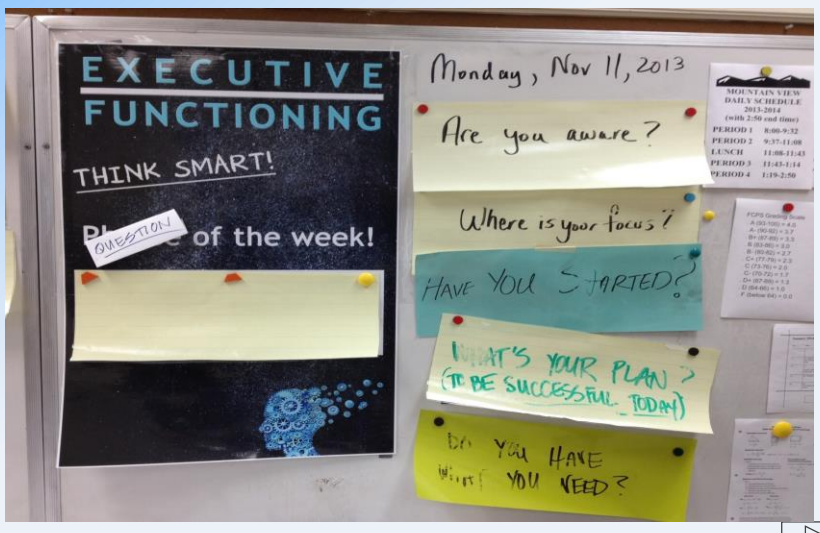
conclusions

EF Lesson Plan *Themes*

- Attention
- Flexibility
- Inhibition
- Initiation
- Self-Monitoring
- Working Memory
- Organization
- Planning
- Emotional Regulation

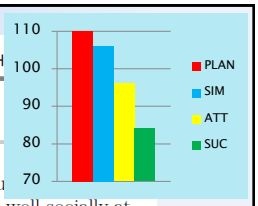
EF Posters in the Class

EF Posters in the Class



conclusions

Case of Ben



32

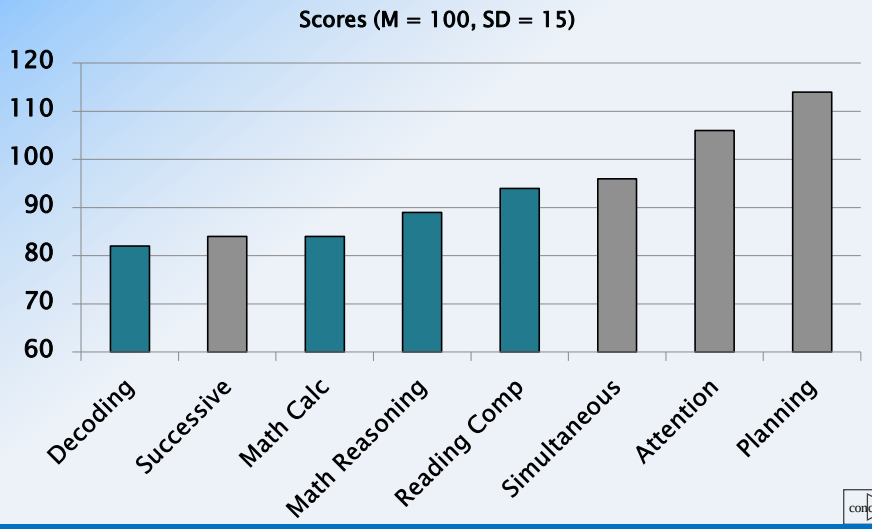
Ben's Problem with Successive Processing

Ben was an energetic but frustrated third-grade stu
his teachers, was popular with his peers, and fit in well socially at school. However, Ben said he did not like school at all, particularly schoolwork. Ben was good at turning in all of his work on time, and he worked hard, but he earned poor grades. He appeared to be getting more and more frustrated at school.

In general, Ben struggled to perform well because he had a lot of trouble following directions that were not written down, his writing often did not make sense, and he did not appear to comprehend what he read. Ben's teachers noticed that when directions for assignments and projects were given orally in class, he often only finished part of the task. Ben's teacher described an assignment in which students had to collect insects, label them, organize them into a collection, and then give a brief presentation about each insect. Unlike any other student, Ben chose to make the labels for the insects first and then go look for the insects. He found only a few of the insects he had made labels for, and when he put them in the collection, they were not in the order that had been specified. He also had trouble with the spelling of the scientific names of the insects and made many errors in the sequence of letters in the words.

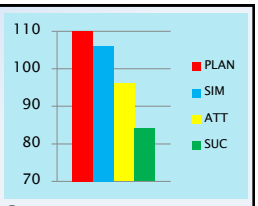
conclusions

Ben's Problem with Successive processing Ability



conclusions

Case of Ben

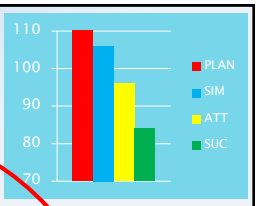


- Planning = Strength
- Successive = Weakness and it is < 85; so it can be considered a 'disorder in basic psychological processes'

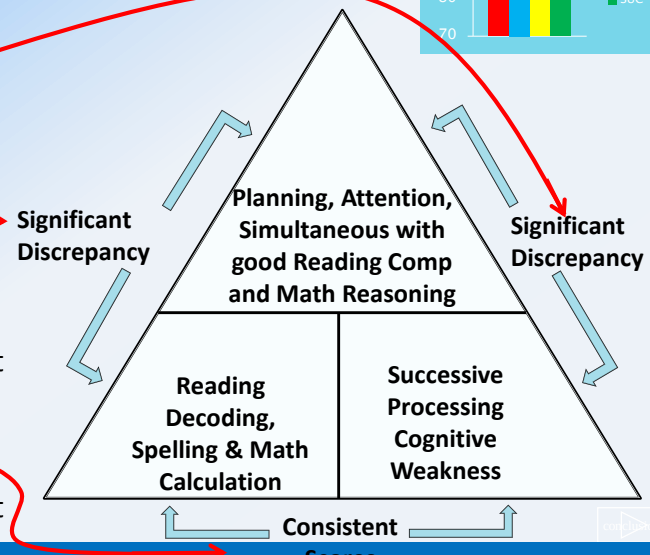
		Diff
Planning	114	14
Attention	106	6
Simultaneous	96	-4
Successive	84	-16
PASS Mean	100	

conclusions

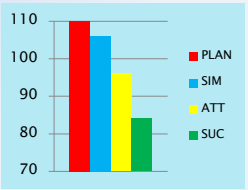
Discrepancy Consistency Model for Ben



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



Ben's Problem with Successive Processing



- Ben has difficulty whenever ANY task requires sequencing
  - Academic or ability tests
  - Visual or auditory tests
  - Math or spelling or reading
  - Tasks that require memory of sequences
- How do we help him learn better?

Ben's Problem with Successive

- Teach him to use his strength in Planning

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.

Ben's Problem with Successive Ability

- Teach him to recognize sequences

How to Teach Successive Processing Ability

The first step in teaching children about their own abilities is to explain what Successive processing ability is. In Figure 1 (which is included in the PASS poster on the CD), we provide a fast and simple message: "Think smart and follow the sequence!" We should begin by helping children realize that they have many different types of abilities and that Successive processing is one of them. During appropriate times during the day, remind students to closely attend to the sequence of information—when reading, presenting information in written text, examining the sequence of letters when doing spelling, solving math equations, and so forth. We need to teach children to approach *all* of their work with an understanding of how the information is sequenced. Throughout the day, the teacher should do the following:

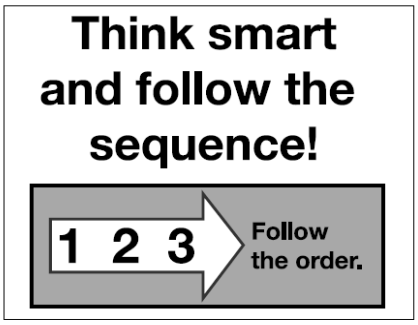


Figure 1. A graphic that helps students understand Successive processing.

Ben's Problem with Successive Ability

- Teach him to recognize sequences

How to Teach Successive Processing Ability

1. Teach children that most information is presented in a specific sequence so that it makes sense.
2. Encourage children by asking, "Can you see the sequence of events here?" or "Did you see how all of this is organized into a sequence that must be followed?"
3. Remind the students to think of how information is sequenced in different content areas, such as reading, spelling, and arithmetic, as well as in sports, playing an instrument, driving a car, and so forth.
4. Teach children that the sequence of information is critical for success.
5. Remind students that seeing the sequence requires careful examination of the serial relationships among the parts.

Ben's Problem with Successive Ability

Using Plans to Overcome Anxiety

Graphic Organizers for Connecting and Remembering Information

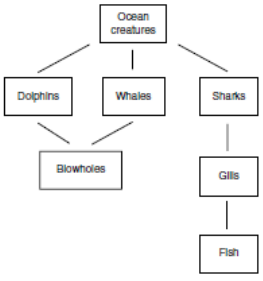


Figure 1. One kind of graphic organizer.

Another type of graphic organizer is a Venn diagram, which uses circles to demonstrate how concepts are related. Figure 2 shows the same information as Figure 1, but in the form of a Venn diagram.

How to Teach Graphic Organizers

Graphic organizers are fairly simple to create. They need not be reserved for factual information. They can be used for activities such as exploring creative concepts, organizing writing, and developing language skills. The following four steps can be used to create a graphic organizer:

1. Select information that you need to present to the child

conclusions

213

Ben's Problem with Successive Ability

- Teach him to use strategies

Chunking for Reading/Decoding

Segmenting Words for Reading/Decoding and Spelling

Decoding a written word requires the person to make sense out of printed letters and word to translate letter sequences into sounds. This demands understanding the sounds that let represent and how letters work together to make sounds. Sometimes words can be segme into parts for easier and faster reading. The word *into* is a good example because it contain words that a child may already know: *in* and *to*. Segmenting words can be a helpful strateg reading as well as spelling.

How to Teach Segmenting Words

Segmenting words is an effective strategy to help students read and spell. By dividing the

Chunking & Spelling

An illustration

conclusions

The Case of Larry – Age 8 Years 8 months

Linda M. Einhorn-Marcoux, M.A.,
Examiner & Intervention Instructor

Naglieri, J. A. (in press). Best Practices in Linking Cognitive Assessment of Students with Learning Disabilities to Interventions in A. Thomas and J. Grimes (Eds.) *Best Practices in School Psychology* (Fifth Edition). Bethesda: NASP.

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Case of Larry

- Larry is a third grader who was evaluated at the request of his parents because of their concern about his chronic problems with spelling and written language
- Larry likes to read but he has spelling problems
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conclusions

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	Standard Score	Difference from Mean	
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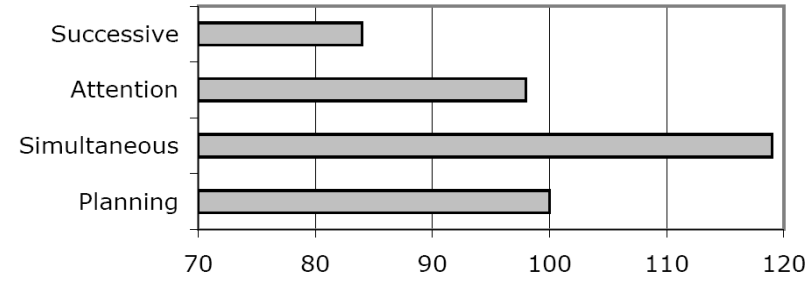

conclusions

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- Word Attack 86
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PREP Intervention

- Larry attended nine one-hour sessions three times a week over the course of approximately 3 weeks
- During this time Larry received individualized instruction and completed four tasks from the PASS Reading Enhancement Program (PREP; see Naglieri & Das, 2005)
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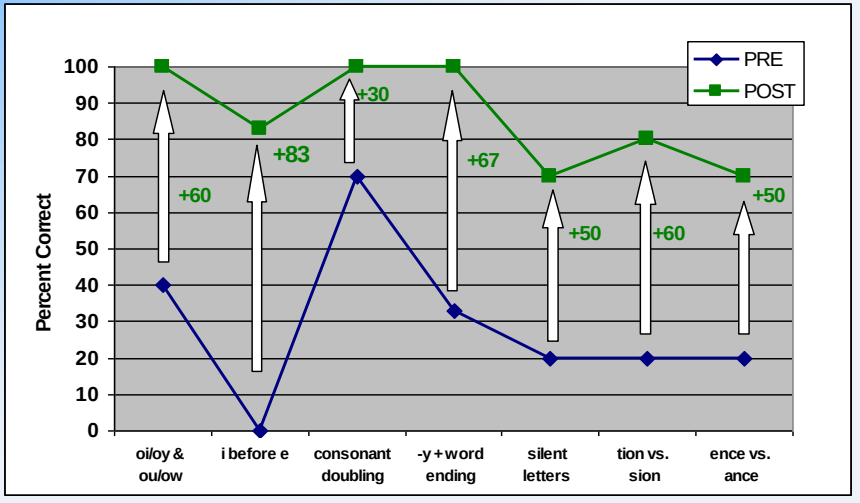
- Larry completed several homework assignments as a way of practicing the various rules and skills being taught

conclusions

Larry's Pre-Post skills scores



conclusions

Larry's Pre-Post *Standard Scores*

ADHD – Case of Christopher

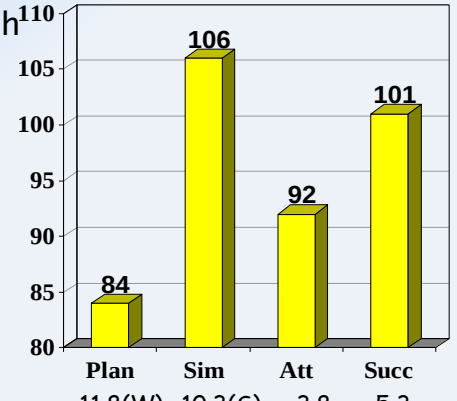
- Hyperactive-Impulsive
  And
  Inattentive Types

Case of Christopher – Is He ADHD?

- Problems
  - behavior problems
  - impulsive & disorganized
  - forgets assignments
  - can't stay on task
  - poor grades
- Clinical Observations
  - anxious about testing
  - used simple strategies
  - did sloppy work
  - control problems (threw pencil when frustrated)
  - impulsive choices made
- RESULTS
- CBCL **Externalizing = 68**
  - failure in control, impulsivity problems, arguing, attention-getting behaviors.

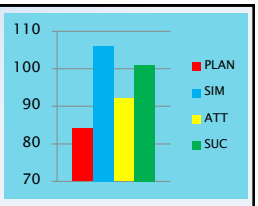
Case of Christopher – Which Handouts?

- How do we help Christopher with his math problem?
- WJ-Achievement
  - Broad Reading = 106
    - Comprehension = 117
    - Word Attack = 108
    - Dictation = 82
  - Broad Math = 100
    - Applied Problems = 93
    - Calculation = 86



Child's mean = 95.8; d values are above

Helping Children Learn

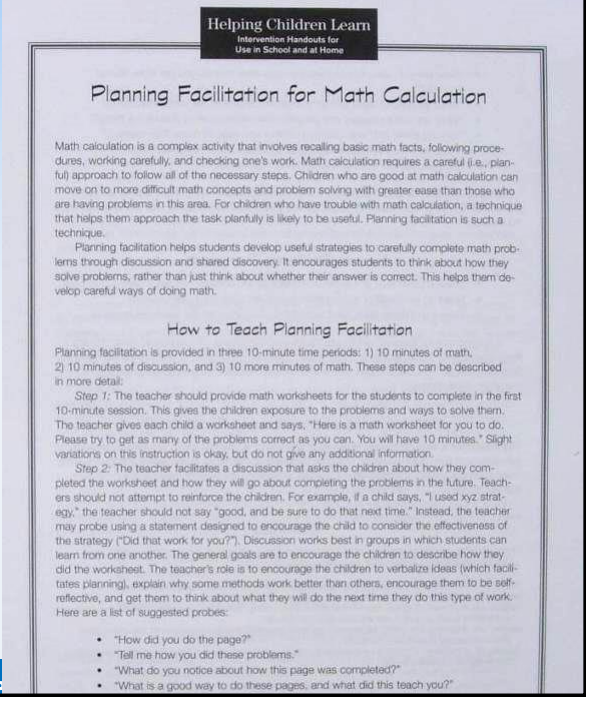


- Planning Facilitation (p. 109)
- Plans for Basic Math Facts (p. 113)
- Touch Math for Calculation (p. 117)
- Seven Step Strategy for Math Word Problems (p. 121)
- Chunking Strategy for Multiplication (p. 123)

conclusions

Math

- Planning facilitation teaches children to be strategic
- This helps children who are low in planning



Helping Children Learn
Intervention Handouts for Use in School and at Home

Planning Facilitation for Math Calculation

Math calculation is a complex activity that involves recalling basic math facts, following procedures, working carefully, and checking one's work. Math calculation requires a careful (i.e., planful) approach to follow all of the necessary steps. Children who are good at math calculation can move on to more difficult math concepts and problem solving with greater ease than those who are having problems in this area. For children who have trouble with math calculation, a technique that helps them approach the task planfully is likely to be useful. Planning facilitation is such a technique.

Planning facilitation helps students develop useful strategies to carefully complete math problems through discussion and shared discovery. It encourages students to think about how they solve problems, rather than just think about whether their answer is correct. This helps them develop careful ways of doing math.

How to Teach Planning Facilitation

Planning facilitation is provided in three 10-minute time periods: 1) 10 minutes of math, 2) 10 minutes of discussion, and 3) 10 more minutes of math. These steps can be described in more detail:

Step 1: The teacher should provide math worksheets for the students to complete in the first 10-minute session. This gives the children exposure to the problems and ways to solve them. The teacher gives each child a worksheet and says, "Here is a math worksheet for you to do. Please try to get as many of the problems correct as you can. You will have 10 minutes." Slight variations on this instruction is okay, but do not give any additional information.

Step 2: The teacher facilitates a discussion that asks the children about how they completed the worksheet and how they will go about completing the problems in the future. Teachers should not attempt to reinforce the children. For example, if a child says, "I used xyz strategy," the teacher should not say "good, and be sure to do that next time." Instead, the teacher may probe using a statement designed to encourage the child to consider the effectiveness of the strategy ("Did that work for you?"). Discussion works best in groups in which students can learn from one another. The general goals are to encourage the children to describe how they did the worksheet. The teacher's role is to encourage the children to verbalize ideas (which facilitates planning), explain why some methods work better than others, encourage them to be self-reflective, and get them to think about what they will do the next time they do this type of work. Here are a list of suggested probes:

- "How did you do the page?"
- "Tell me how you did these problems."
- "What do you notice about how this page was completed?"
- "What is a good way to do these pages, and what did this teach you?"

HAMMILL INSTITUTE ON DISABILITIES

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

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

conclusions

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 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

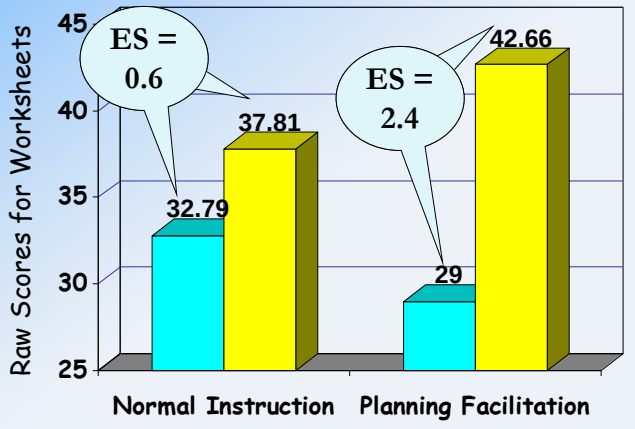
- "My goal was to do all of the easy problems on every page first, then do the others."
- "I do the problems I know, then I check my work."
- "I do them (the algebra) by figuring out what I can put in for X to make the problem work."
- "I did all the problems in the brain-dead zone first."
- "I try not to fall asleep."

conclusions

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."

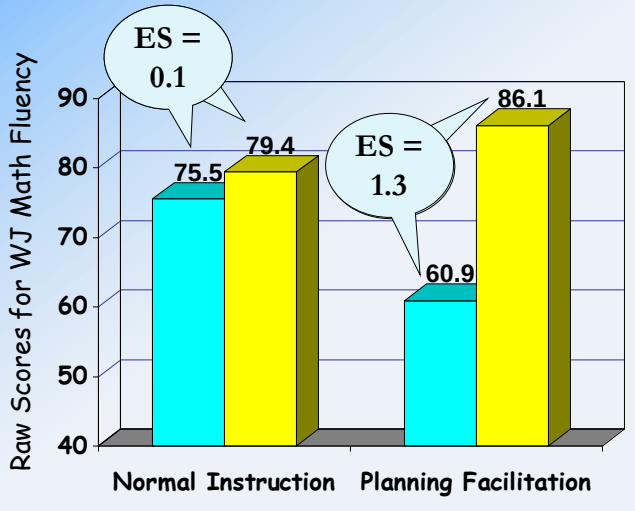
Worksheet Means and Effect Sizes for the Students with ADHD



Reminder
< .2 = no effect
.2 - .5 = small
.6 - .8 = medium
> .8 = large

conclusions

WJ Math Fluency Means and Effect Sizes for the Students with ADHD



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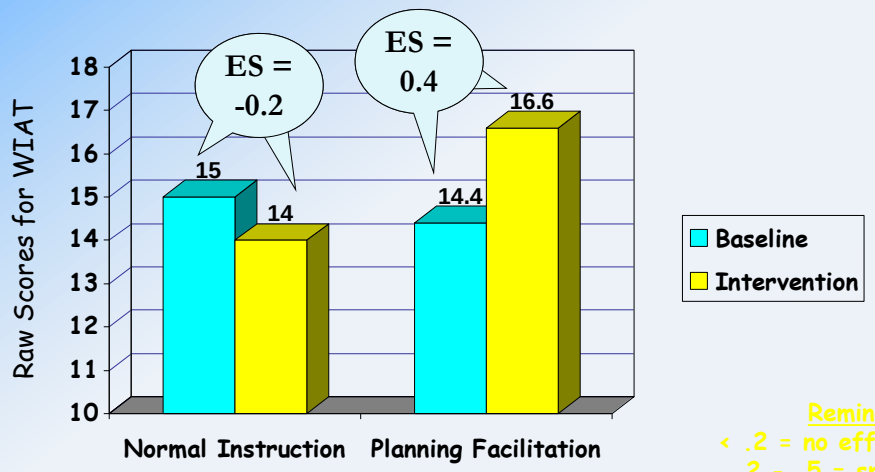
WIAT Numerical Operation Means and Effect Sizes for Students with ADHD



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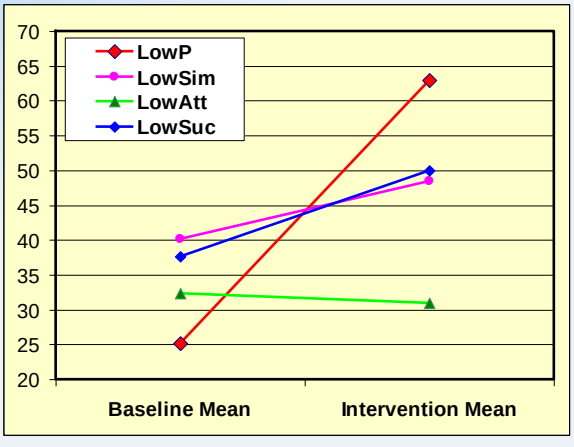
conclusions

Iseman (2005)

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



conclusions

One Year Follow-up

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 ($M = 3.21$, $SD = 18.21$, $d = 0.09$).

Instructional Implications

- Planning Strategy Instruction is easily implemented in the classroom
- The method yields substantial results within a minimal of time (10 half-hour sessions over 10 days)
- Planning Strategy Instruction can be applied in math as well as other content areas (e.g., reading comprehension)

The Case of Larry – Age 8 Years 8 months

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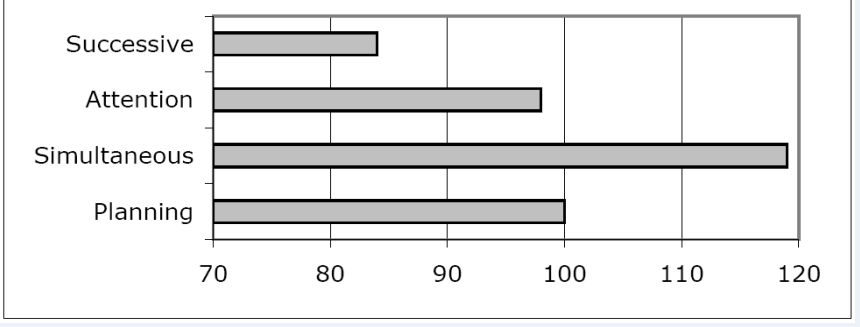

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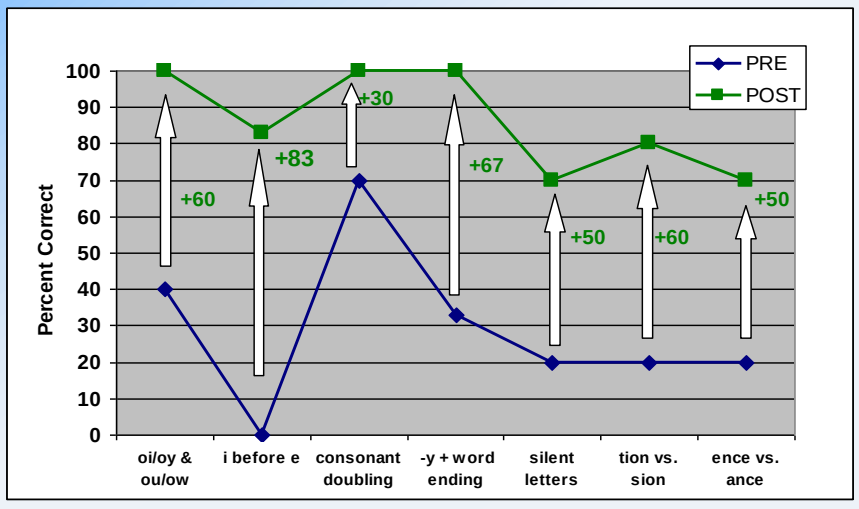

conclusions

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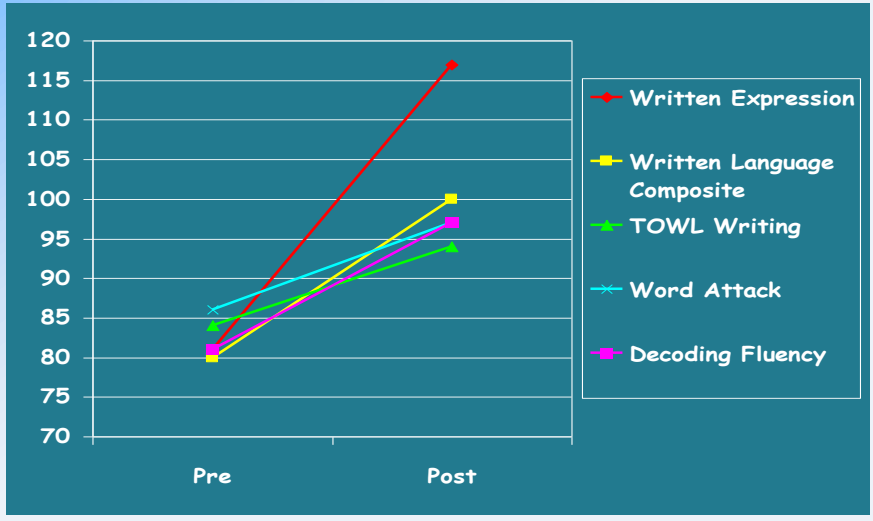


Frankie

- Severe Attention Problem with poor academics and anxiety

Frankie – Attention CW

- Referred by parents (at age 11) after a history of reading difficulties and self esteem problems
- Cognitive Assessment System
- WJ-R, WRAT-3, PPVT-III
- Behavioral/Emotional
  - Devereux Scales of Mental Disorders
- Self Concept
  - Bracken Multidimensional Self Concept Scale

Frankie

- 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

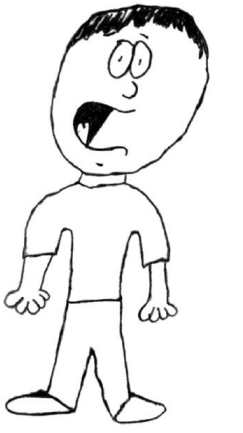
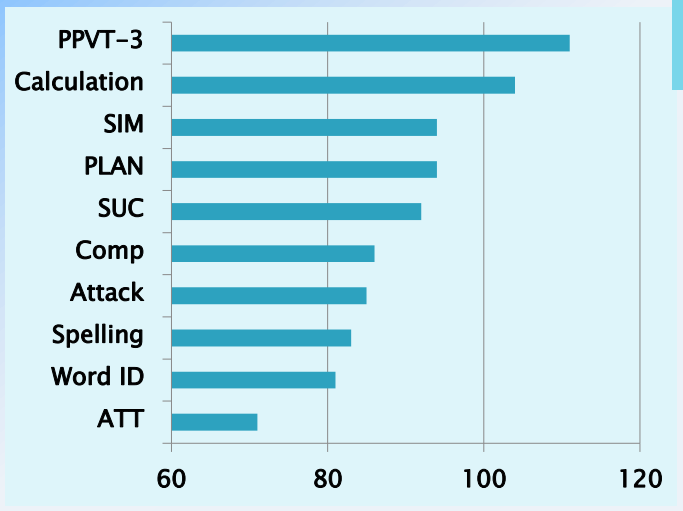


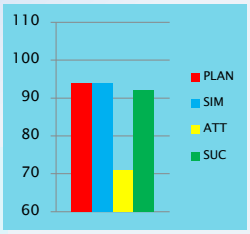
Figure 3.4. Frankie's self-portrait.

Frankie

Tests	Score	%tile
Letter-Word Id	81	10
Passage Comp	86	17
Word Attack	85	16
Spelling	83	13
Calculation	104	60
PPVT-III	111	82

Frankie

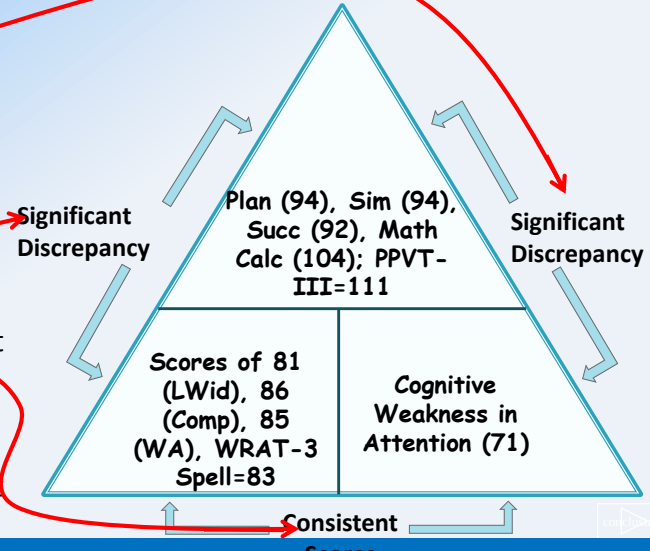




conclusions

Frankie Discrepancy Consistency Results

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



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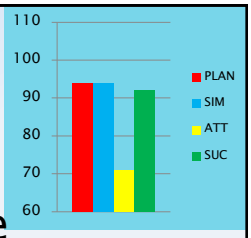

- Frankie has weaknesses in PASS & achievement which are consistent with a *Specific Learning Disability*
  - "… a disorder in one or more of the basic psychological processes (Attention from CAS)…[with an] impaired ability to...read, write, spell..." (IDEA, 1997).
- Also – Inattentive Type of ADHD

Frankie

- **Attention Handouts**
  - Teaching Students About Attention (p.58)
  - Overcoming Problems with Inattention (p. 67)
  - Improving Attention (p. 76)
- These handouts encourage the teacher and Frankie's parents to help him understand him options for overcoming his attention weakness

Slides by Jack A. Naglieri,

What Should Teacher s& Parents do?

How to Teach Students to Attend

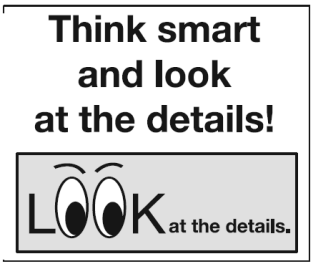

Figure 1. A graphic that reminds students to focus on information being discussed.

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

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

Cognitive Assessment Sy

Frankie

Help Frankie better manage his attention problem

Overcoming Problems with Inattention

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

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

How to Help a Child Overcome Problems with Inattention

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

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

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

1. Promote success via small steps.
2. Ensure success at school and at home.
   - Allow for oral responses to tests.
   - Circumvent reading whenever possible.
3. Teach rules for approaching tasks.
   - Help the child to define tasks accurately.
   - Assess the child's knowledge of problems.

Overcoming Problems with Inattention (continued)

4. Discourage passivity and encourage i
   Reduce the use of teacher solutions c
   - Require the child to take responsib
   - Help the child to become more sel
5. Encourage the child to avoid:
   - Excessive talking
   - Working fast with little accuracy
   - Giving up too easily
   - Turning in sloppy, disorganized pa

Third, teachers and parents should give the child

1. Model and teach strategies that impro
2. Help the child to recognize when he o

Who Should Receive Help with Over

This instruction benefits students who have probl
active. These strategies may be particularly helpf
tention and children who show weaknesses in At
cause a student who has a Planning weakness m
and controlling his or her actions, these strategie
student follow specific plans to increase his or he

Resources

Sources for information on Attention problems ar
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Barkley, R.A., & Murphy, K.R. (1998). Attention-deficit hype
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Pressley, M., & Woloshyn, V. (1995). Cognitive strategy inst
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Welton, E. (1999). How to help inattentive students find su
Teaching Exceptional Children, 31, 12–18.

Cognitive Assessment System –

Frankie – Intervention

- Level I: Help child understand the deficit
  - Attention, resistance to distraction,
  - Recognition of how the deficit affects daily functioning
- Level II: Improve Motivation & Persistence
  - Promote success via small steps
  - Ensure success at school and at home
  - Allow for oral responses to tests to circumvent reading when possible

Frankie – Intervention

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

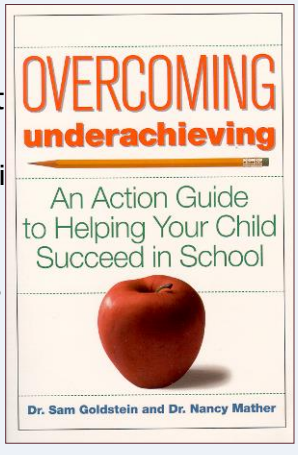
Frankie – Intervention

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

Frankie – Intervention

Improve resilience and self-esteem

- Goldstein & Mather (1998) suggest that the child
  - have a significant adult who is positi and supportive
  - tutor younger children
  - know that everyone makes mistakes
  - become good at some things



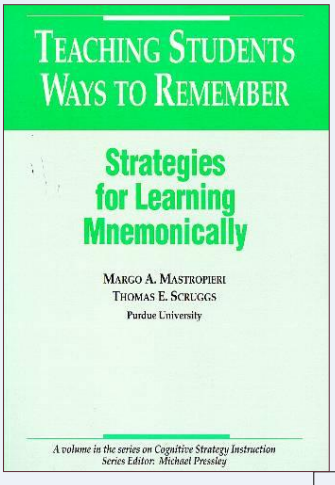
Frankie – Intervention

- Level III: Problem-Solving Strategies
  1. Teach strategies that increase inhibition and organization
     - encourage the use of date books
     - teach the child to count to 10 before answering
  2. Teach strategies to increase the level of alertness
  3. Teach other relevant strategies
     - mnemonic devices (Mastropieri & Scruggs, 1991)
     - reading or math strategies (Pressley & Woloshyn, 1995)

conclusions

Mastropieri & Scruggs (1991)

- Mnemonics are strategies:
  - for learning
  - for improving memory
- Topics include:
  - vocabulary, science, reading, spelling, math



conclusions

Frankie

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

conclusions

Frankie – Use Planning Strength

102

Strategies for Spelling

Spelling is an activity that requires the recall of specific letters in order and combining sounds with letter groups so that words can be recognized. Good spellers are skilled at memorizing how to correctly spell words even when the words are difficult or unpredictable. Often, spelling lists are given and students write the words over and over or rewrite them alphabetically. In order to make spelling easier for these students, give them a plan or strategy that includes various rules for spelling. A child who knows or has access to various spelling rules is likely to be able to spell many words correctly, rather than just the few that have been memorized. This intervention is intended to help students use certain rules or plans to spell words, particularly ones that are commonly misspelled or are spelled in a way other than how they sound.

When a child uses a rule or plan to spell, the answer is obtained by thinking (using the plan or rule), rather than just relying on remembering the string of letters. For example, a student may want to spell *science* but may not be sure of the order of the letters. If the child is taught the rule "*i* before *e* except after *c*," then he or she is more likely to spell the word correctly. This strategy changes the task from one that demands Successive processing to one that involves Planning.

How to Teach Strategies for Spelling

Following are a number of rules and strategies for spelling words. This list is not intended to be exhaustive, but it includes many of the major rules used for spelling. These rules may be varied, and the more memorable they are for the student, the more likely they are to be used (see the Mnemonics for Spelling handout [p. 101] for additional interventions). Students also need to understand that these are rules of thumb, and in some cases the rules do not work for every word.

- Write *i* before *e* except after *c* (e.g., *receive*, *perceive*, *field*, *believe*, *niece*, *siege*).
- The letter *q* is always written with *u* and sounds like "kw."
- The vowel *y*, not *i*, is used at the end of English words (e.g., *my*).
- The majority of nouns in English form their plural by simply adding a final *-s*.
- Nouns that end with *-s*, *-z*, *-x*, *-sh*, *-ch*, and *-o* form their plural by adding *-es* (e.g., *glasses*, *buzzes*, *boxes*, *bushes*, *switches*, *potatoes*, *heroes*). Some exceptions include *studios*, *pianos*, *kangaroos*, and *zoos*.
- To form plurals for nouns that end in a consonant and *-y*, change *-y* to *-i* and add *-es* (e.g., *babies*, *spies*, *puppies*).
- To form plurals for nouns that end in *-f* or *-fe*, change the *-f* to *-v* and add *-es* (e.g.

Strategies for Spelling (continued)

- When a two-syllable word ends with a vowel and a consonant and final syllable, double the final consonant when adding a vowel suffi admitting).
- Words with a silent final e are written without the e when adding ar with a vowel (e.g., having, writing, biking).
- After a single vowel at the end of a one-syllable word, the -l, -f, and doubled (e.g., full, puff, pass).
- The letter s never follows the letter x (e.g., boxes).
- All is written with one l when added to another syllable (e.g., almos
- When added to another syllable, till and full are written with one -l (
- The letter z, never s, is used for the "z" sound at the beginning of a zipper).
- Words beginning with a vowel and ending in e often lose the e whe added or when a y is added (e.g., desire/desirable, educate/educa There are some exceptions to this general rule (e.g., likeable, lovely
- Only one word ends in -sede: supersede. Only three words end in proceed, succeed. All other words ending with this sound use -ce precede, recede.

Some Other Strategies

- Take the word apart. Break down words into their component part at the word competition. Why is it spelled competition rather than petition is a petition of two or more people for the same thing; they jective. You get the correct spelling by dividing the word into its tw
- Identify prefixes. A prefix is a letter or group of letters at the beginn a word has a prefix, imagine that there is a hyphen between the w and you can generally see the correct spelling. Resolve consists of consists of dis-play. A word that is combined with the prefix dis- is root word begins with s, but only uses a single s if it begins with ar dissatisfy).
- Identify suffixes. When a word has a suffix (i.e., a letter or group of you can often use a strategy similar to the prefix strategy. Imagine the word and the suffix, then double the letter if the word ends and with the same sound (e.g., actual-ly, soul-less). Do not double it w are different (e.g., sincere-ly, clever-ness, heart-less).

Frankie – Use Planning Strength

- This strategy helps him organize the sequence of sounds and letters thereby focus is achieved

Segmenting Words for Reading/Decoding and Spelling

Decoding a written word requires the person to make sense out of printed letters and words and to translate letter sequences into sounds. This demands understanding the sounds that letters represent and how letters work together to make sounds. Sometimes words can be segmented into parts for easier and faster reading. The word *into* is a good example because it contains two words that a child may already know: *in* and *to*. Segmenting words can be a helpful strategy for reading as well as spelling.

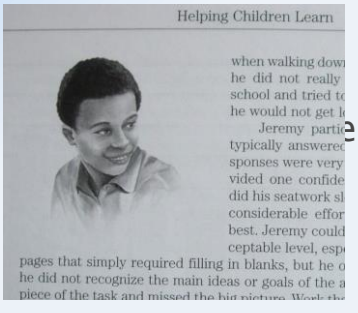
How to Teach Segmenting Words

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

- Take the word apart. Break down the word into its component parts or syllables. For example, look at the word *reshaped*. It includes the main word *shape* with the prefix *re-* and the ending *-d*. Knowing that the main word *shape* has *re* and *d* added makes it easier to recognize than to try and sound out *r-e-s-h-a-p-e-d*.
- Identify prefixes. A prefix is a letter or group of letters at the beginning of a word. When a word has a prefix, imagine that there is a hyphen between the word and the prefix, and you can usually see the main word. For example, *misstep* includes the prefix *mis-* and the word *step* that are simply put together.
- Identify suffixes. Similarly, when a word has a suffix (i.e., a letter or group of letters at the end), you can often use a strategy similar to the prefix strategy. Just imagine a hyphen between the word and the suffix (e.g., *heart-less*).

Who Should Learn This Technique?

Jeremy


Helping Children Learn

when walking dow
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school and tried t
he would not get l
Jeremy partic
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vided one confide
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ceptable level, esp
pages that simply required filling in blanks, but he o
he did not recognize the main ideas or goals of the a
piece of the task and missed the big picture. Work th

Low Simultaneous Processing from elping Children Learn

conclusions

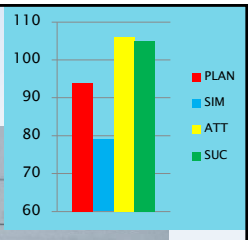
Jeremy

- Likable social fifth grade student
- Paid attention, worked hard
- Sometimes he got confused
  - Had problems finding his way at school
  - Missed the main idea
  - Integration of ideas was difficult
  - Trouble grasping new concepts
  - Couldn't pick out important parts of problems
  - Did not use context cues

conclusions

Jack A.

Jeremy



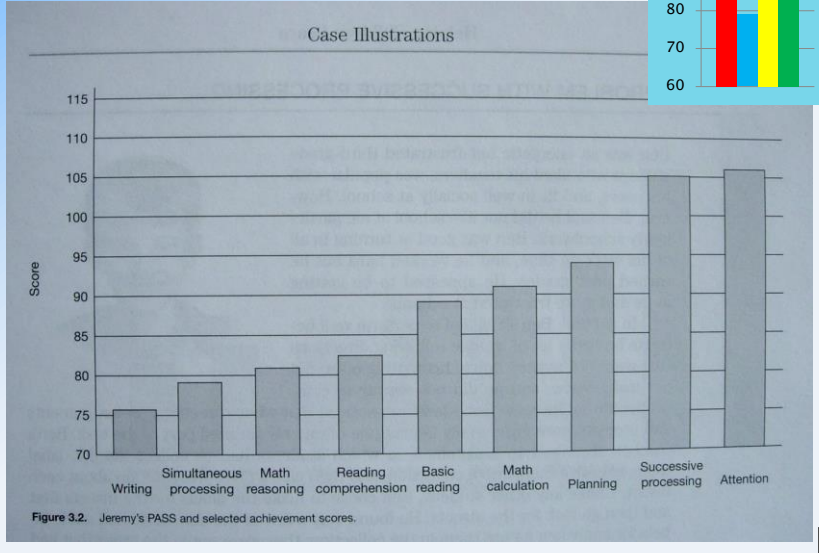


Figure 3.2. Jeremy's PASS and selected achievement scores.

conclusions

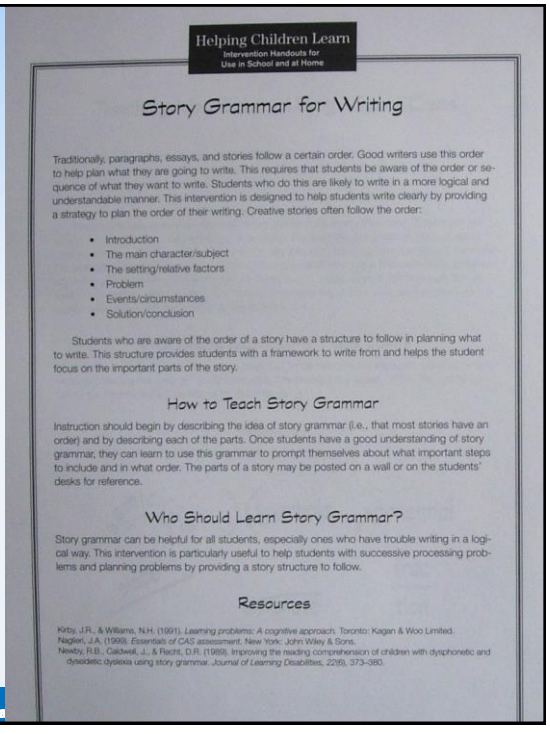
Jeremy

- Story Grammar for Reading Comprehension (p. 77)
- Story Grammar for Writing (p. 101)
- Seven Step Strategy for Math Word Problems (p. 121)

conclusions

Jeremy

- Story maps give Jeremy a graphic way of organizaing relevant information



Helping Children Learn
Intervention Handouts for Use in School and at Home

Story Grammar for Writing

Traditionally, paragraphs, essays, and stories follow a certain order. Good writers use this order to help plan what they are going to write. This requires that students be aware of the order or sequence of what they want to write. Students who do this are likely to write in a more logical and understandable manner. This intervention is designed to help students write clearly by providing a strategy to plan the order of their writing. Creative stories often follow the order:

- Introduction
- The main character/subject
- The setting/relative factors
- Problem
- Events/circumstances
- Solution/conclusion

Students who are aware of the order of a story have a structure to follow in planning what to write. This structure provides students with a framework to write from and helps the student focus on the important parts of the story.

How to Teach Story Grammar

Instruction should begin by describing the idea of story grammar (i.e., that most stories have an order) and by describing each of the parts. Once students have a good understanding of story grammar, they can learn to use this grammar to prompt themselves about what important steps to include and in what order. The parts of a story may be posted on a wall or on the students' desks for reference.

Who Should Learn Story Grammar?

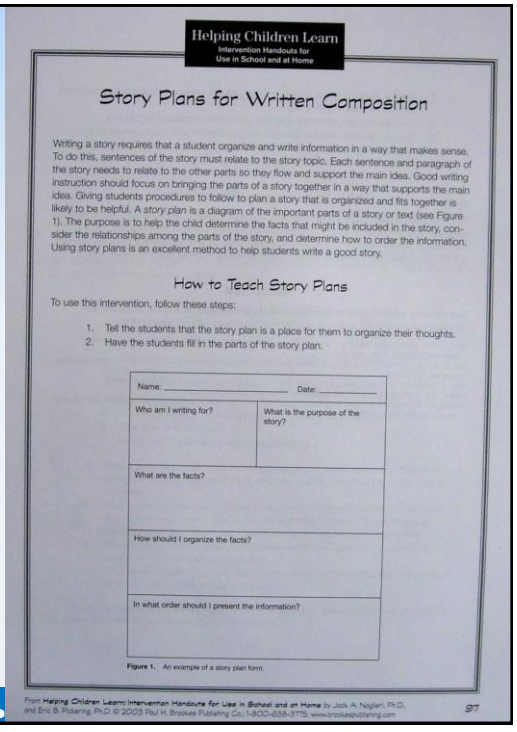
Story grammar can be helpful for all students, especially ones who have trouble writing in a logical way. This intervention is particularly useful to help students with successive processing problems and planning problems by providing a story structure to follow.

Resources

Kirby, J.R., & Williams, N.H. (1991). *Learning problems: A cognitive approach*. Toronto: Kagan & Woo Limited.
Naglieri, J.A. (1999). *Essentials of CAS assessment*. New York: John Wiley & Sons.
Newby, R.B., Caldwell, J., & Recht, D.R. (1989). Improving the reading comprehension of children with dysphonetic and dyseidetic dyslexia using story grammar. *Journal of Learning Disabilities, 22*(6), 373–380.

Jeremy

- Story plans also help Jeremy see how text is or can be organized



Helping Children Learn
Intervention Handouts for Use in School and at Home

Story Plans for Written Composition

Writing a story requires that a student organize and write information in a way that makes sense. To do this, sentences of the story must relate to the story topic. Each sentence and paragraph of the story needs to relate to the other parts so they flow and support the main idea. Good writing instruction should focus on bringing the parts of a story together in a way that supports the main idea. Giving students procedures to follow to plan a story that is organized and fits together is likely to be helpful. A *story plan* is a diagram of the important parts of a story or text (see Figure 1). The purpose is to help the child determine the facts that might be included in the story, consider the relationships among the parts of the story, and determine how to order the information. Using story plans is an excellent method to help students write a good story.

How to Teach Story Plans

To use this intervention, follow these steps:

1. Tell the students that the story plan is a place for them to organize their thoughts.
2. Have the students fill in the parts of the story plan.

Name: _____ Date: _____

Who am I writing for?	What is the purpose of the story?
What are the facts?	
How should I organize the facts?	
In what order should I present the information?	

Figure 1. An example of a story plan form.

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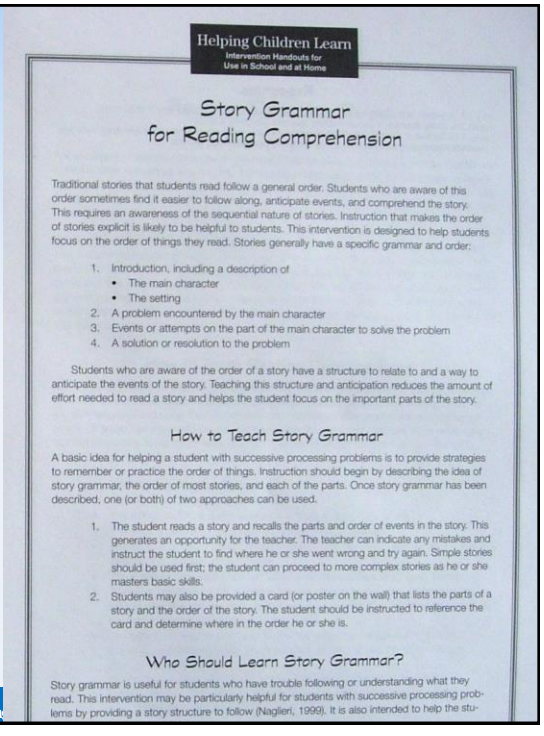
Jeremy

- Story maps also help Jeremy see how information is organized



Helping Children Learn
Intervention Handouts for Use in School and at Home

Story Grammar for Reading Comprehension

Traditional stories that students read follow a general order. Students who are aware of this order sometimes find it easier to follow along, anticipate events, and comprehend the story. This requires an awareness of the sequential nature of stories. Instruction that makes the order of stories explicit is likely to be helpful to students. This intervention is designed to help students focus on the order of things they read. Stories generally have a specific grammar and order:

1. Introduction, including a description of
   - The main character
   - The setting
2. A problem encountered by the main character
3. Events or attempts on the part of the main character to solve the problem
4. A solution or resolution to the problem

Students who are aware of the order of a story have a structure to relate to and a way to anticipate the events of the story. Teaching this structure and anticipation reduces the amount of effort needed to read a story and helps the student focus on the important parts of the story.

How to Teach Story Grammar

A basic idea for helping a student with successive processing problems is to provide strategies to remember or practice the order of things. Instruction should begin by describing the idea of story grammar, the order of most stories, and each of the parts. Once story grammar has been described, one (or both) of two approaches can be used.

1. The student reads a story and recalls the parts and order of events in the story. This generates an opportunity for the teacher. The teacher can indicate any mistakes and instruct the student to find where he or she went wrong and try again. Simple stories should be used first; the student can proceed to more complex stories as he or she masters basic skills.
2. Students may also be provided a card (or poster on the wall) that lists the parts of a story and the order of the story. The student should be instructed to reference the card and determine where in the order he or she is.

Who Should Learn Story Grammar?

Story grammar is useful for students who have trouble following or understanding what they read. This intervention may be particularly helpful for students with successive processing problems by providing a story structure to follow (Naglieri, 1999). It is also intended to help the stu-

Conclusions

Main Points and Implications

Conclusions

- **A neurocognitive approach** to assessment is a modern way to conceptualize ability
  - Traditional IQ tests serve an important role in our field but they have limitations in today's world
- PASS theory as measured by CAS provides a way to measure "basic psychological processes"
- Research shows that
  - PASS profiles are useful for eligibility determination
  - PASS is very appropriate for diverse populations
  - PASS leads to Instructional design

Conclusions

- **From assessment to intervention**
  - Cognitive processing scores can be used to select research based cognitive interventions based on a child's pattern of cognitive and academic strengths and weaknesses.
  - Research with children who have SLD shows that teaching strategy use (Planning) has a significant effect on academic performance in the classroom and on standardized tests
- **We can teach children to better use their PASS neuropsychological abilities**
  - This will improve their academic skills
  - This will improve LIFE skills
  - This will improve the child's self confidence

Conclusions

- It is time to move beyond the IQ tests built on the Army Mental Tests of the early 1900s
- We can advance the field by moving toward theoretically based approaches to defining and measuring abilities
- Uniting a modern approach with its application to instruction will allow us to better assess and educate students for the future
- Thank you…