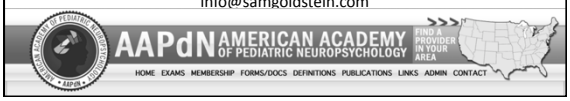
Pediatric Neuropsychological Evaluation with the CAS-2

Sam Goldstein, Ph.D.
Assistant Clinical Professor
University of Utah School of Medicine
www.samgoldstein.com
info@samgoldstein.com



Disclosure

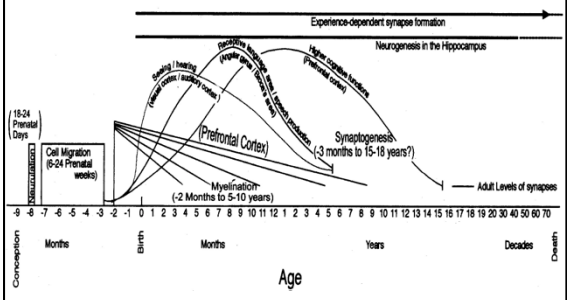
- Co-author of the CAS 2.
- Editor in Chief Journal of Attention Disorders.
- Co-author of the Comprehensive Executive Functioning Inventory.
- Author, Co-author, Editor, Co-editor of multiple textbooks.

The Developing Brain

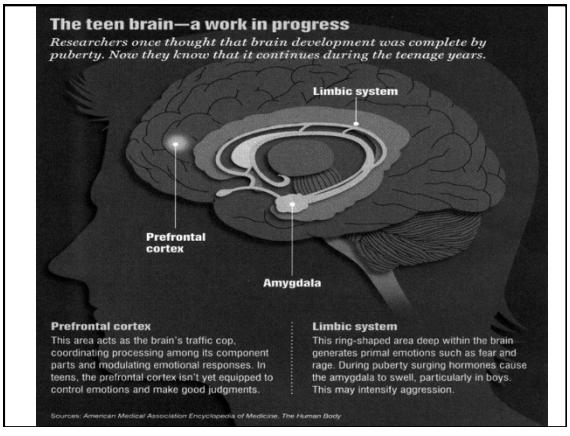
Addition, Subtraction, and Reorganization

Normal or Not?

The Developmental Course of Human Brain Development



American Psychologist, January 2001



Neurological development is not a simple process of gradual growth from simple to complex.

Development occurs from conception through childhood.

- Additive processes involve proliferation of neurons, development of synaptic connections and myelinization.
- Subtractive processes involve programmed cell death prenatally and synaptic pruning postnatally.
- Development is more than overproduction followed by cutting back, substantial functional reorganization takes place.

Differences in the ways the brain of the young child differs from the adult.

- Increased metabolic activity peaking at 150% by two years of age
- Focal or localized brain functions in adults are carried out by diffuse regions in children
- Adults utilize inhibitory processes, children do not as routinely
- Less automatization of brain mediated functions in children

Compared with the brain of the child, representation of function in the adult brain is likely to be more focal, to make greater use of inhibitory processes, and to implicate non-cortical regions associated with the automatization of skills

Who are we, what do we do and why?

Psychology: the scientific study of the human mind and its functions, especially those affecting behavior in a given context.

Neuropsychology: the scientific study of the relationship between behavior, emotion, and cognition on the one hand, and brain function on the other.

Clinical Neuropsychology: the scientific evaluation of the relationship between behavior, emotion, and cognition on the one hand, and brain function on the other.

Clinical Neuropsychology

The organized assessment of ability, knowledge, and skill.

Neuropsychological assessment begins with the collection and measurement of brain based abilities responsible for thinking, learning, feeling and behavior.

Neuropsychological assessment then involves developing an understanding of the complex interaction of these abilities with each other and with environmental factors.

Finally, neuropsychological assessment concludes with etiological opinions and prescriptive interventions.

Neuropsychological Assessment Follows a Logical Course

- Knowledge of the brain and body
- Educational history
- Vocation history if relevant
- Personal and psychiatric history
- Nature of trauma if relevant
- Immediate and subsequent symptom course
- The integration of historical, qualitative and quantitative data as a means of testing hypotheses and prescribing intervention

Critical Issues

- Demographics
- Symptoms vs. consequences
- Categories vs. dimensions
- Developmental pathways: accept a moment in time
- There are no shortcuts
- Assess the environment

Critical Issues

- Assess for intervention
- Understand sensitivity vs. specificity
- Begin with the disruptive/non-disruptive continuum
- Keep low incidence disorders in mind
- Resilience factors

Four Waves of Resilience Research

- Identifying person and variable-focused factors that make a difference.
- Identifying and understanding the operation of these factors within systems with a process focus.
- Intervening to foster resilience.
- Creating systems that foster resilience.

Person Attributes Associated With Successful Coping*

- Affectionate, engaging temperament.
- Sociable.
- Autonomous.
- Above average IQ.
- Good reading skills.
- High achievement motivation.
- Positive self-concept.
- Impulse control.
- Internal locus of control.
- Planning skills.
- Faith.
- Humorous.
- Helpfulness.

* Replicated in 2 or more studies

Environmental Factors Associated With Successful Coping*

- Smaller family size.
- Maternal competence and mental health.
- Close bond with primary caregiver.
- Supportive siblings.
- Extended family involvement.
- Living above the poverty level.
- Friendships.
- Supportive teachers.
- Successful school experiences.
- Involvement in pro-social organizations.

*Replicated in 2 or more studies.

The pathways that lead to positive adaptation despite high risk and adversity are complex and greatly influenced by context therefore it is not likely that we will discover a magic (generic) bullet.

Resilient children are not simply born that way nor are they made from scratch by their experiences. Genetic and environmental experiences loom large as protectors against a variety of risks to healthy development ranging from resistance to bacteria and viruses to resilience to maltreatment and rejection.

Kirby Deater-Deckard

Component Skills Traditionally Measured in a Neuropsychological Assessment

- Attention
- Language
- Intellect
- Sensorimotor Functions
- Visuospatial Functions
- Memory and Learning
- Executive Functions
- Achievement
- Pain, Emotional state and personality style

A Proposed New Framework for Pediatric Neuropsychological Assessment

- Measurement of abilities.
- Measurement of knowledge.
- Assessment of skillful behavior across emotional, behavioral, interpersonal, educational contexts.

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

Census Matched

Table 3.1 Demographic Characteristics of the Normative Sample

Characteristics	Percentage of normative sample (*N* = 1,342)	Percentage of U.S. school-age population (2011)
Gender[a]		
Male	51.1	51.1
Female	48.9	48.9
Region[b]		
Northeast	17.9	17.1
South	38.8	37.2
Midwest	20.9	21.7
West	22.4	24.0
Ethnicity[c]		
White	77.9	76.1
Black/African American	15.6	15.1
American Indian/Eskimo/Aleut	0.5	1.2
Asian/Pacific Islander	3.0	4.5
Two or more	3.0	3.1
Hispanic status[c]		
Yes	23.2	21.2
No	76.8	78.8
Exceptionality status		
No exceptionality[d]	86.0	86.0
Gifted and talented[d]	6.3	5.2
Intellectual disability[e]	0.1	0.6
Deaf and hard of hearing[f]	0.1	0.1
Attention-deficit/hyperactivity disorder[g]	6.8	8.6
Autism spectrum disorder[h]	0.6	2.5
Traumatic brain injury[i]	0.3	<0.1
Developmental delay[j]	0.4	0.3
Emotional disturbance[k]	1.3	0.5
Behavioral disorder[l]	0.8	2.5
Learning disability[m]	4.5	8.2
Physical or health impairment	0.1	NA
Language impairment[n]	1.4	1.8
Autism spectrum disorder[o]	1.3	0.5
Household income (in dollars)[b]		
Under 15,000	11.7	13.0
15,000–24,999	10.3	11.0
25,000–34,999	10.5	11.0
35,000–49,999	14.3	14.0
50,000–74,999	19.4	19.0
75,000 and over	33.7	32.0
Parental education[p]		
Less than bachelor's degree	70.0	73.8
Bachelor's degree	19.6	19.3
Graduate degree	10.4	9.0

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Empirically Derived

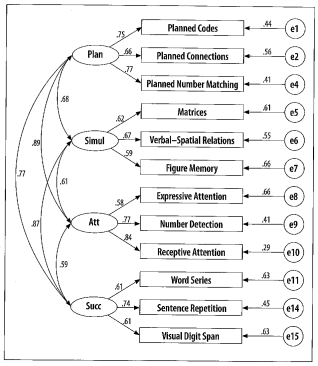

Figure 5.2. Four-factor PASS model for ages 5 to 7 years.

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Gender and Race Fair

Canyon–African American) were examined using cases from the

Table 5.12 CAS2 Scores by Gender

CAS2 value	Male (*n* = 718) *M*	Male (*n* = 718) *SD*	Female (*n* = 668) *M*	Female (*n* = 668) *SD*	Cohen's *d*	Magnitude[a]
Subtests						
Planned Codes	9.7	3.1	10.6	3.0	−0.30	Small
Planned Connections	10.0	3.1	10.0	2.9	0.00	Trivial
Planned Number Matching	9.8	3.1	10.2	2.8	−0.12	Trivial
Matrices	10.0	3.3	10.3	3.2	−0.08	Trivial
Verbal–Spatial Relations	9.9	2.9	10.2	2.9	−0.08	Trivial
Figure Memory	10.1	3.2	10.1	3.0	−0.03	Trivial
Expressive Attention	9.9	3.0	10.0	3.0	−0.03	Trivial
Number Detection	9.7	3.3	10.4	2.9	−0.22	Small
Receptive Attention	9.4	3.2	10.4	3.0	−0.32	Small
Word Series	10.1	3.0	10.2	3.1	−0.02	Trivial
Sentence Repetition	10.0	3.0	10.2	2.8	−0.05	Trivial
Sentence Questions	9.8	2.9	10.2	3.0	−0.14	Trivial
Visual Digit Span	10.0	3.1	10.1	3.0	−0.03	Trivial
Core Battery						
Planning	98.6	15.3	101.3	14.4	−0.18	Trivial
Simultaneous	99.1	15.1	100.5	14.5	−0.09	Trivial
Attention	98.8	15.4	101.1	14.5	−0.16	Trivial
Successive	99.6	15.4	100.0	15.8	−0.08	Trivial
Full Scale	98.6	15.1	101.1	14.5	−0.17	Trivial
Extended Battery						
Planning	98.4	16.0	101.2	14.2	−0.19	Trivial
Simultaneous	99.1	15.1	100.3	14.6	−0.08	Trivial
Attention	98.0	15.4	101.5	14.3	−0.24	Small
Successive	99.5	15.1	100.6	15.4	−0.07	Trivial
Full Scale	98.4	15.4	101.2	14.6	−0.18	Trivial
Supplemental composites						
Executive Function w/o Working Memory	99.8	15.3	100.0	14.4	−0.02	Trivial
Executive Function w/ Working Memory	99.1	15.3	100.3	14.7	−0.08	Trivial
Working Memory	99.1	14.7	100.9	14.8	−0.12	Trivial
Verbal Content	98.0	15.0	101.5	14.6	−0.24	Small
Nonverbal Content	98.6	15.1	101.3	14.7	−0.18	Trivial

Carefully Developed

Relationship Between Strategy Use and Standard Scores

The relationship between reported and observed strategy use and standard scores earned by the students in the standardization sample is summarized for each of the Planning subtests in Table 5.10. The mean subtest scaled score was computed for those students who used and who did not use strategies on each subtest. With the exception of the Planned Connections subtest, results show that the mean scaled scores for those who used strategies were slightly higher than the mean scaled scores obtained by those who did not use strategies. The differences between the two groups suggest that strategy use was associated with modest improvements in Planning scores.

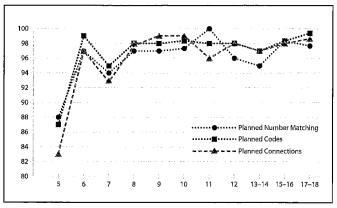

Figure 5.1. Percentage of the standardization sample, by age, who used strategies on the Planning subtests.

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CAS2

- Flexibility with special populations
- Strategy assessment
- Guidelines for providing help.

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.

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CAS2

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

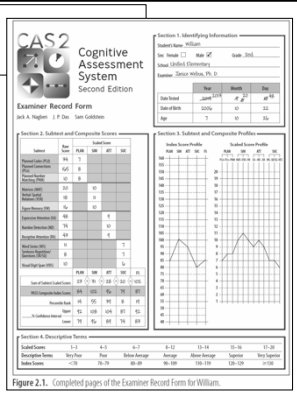

Figure 2.1. Completed pages of the Examiner Record Form for William.

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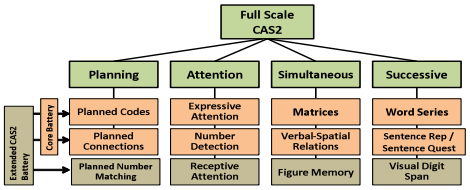
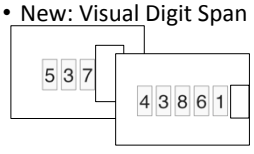
CAS2 Scale and Subtest Structure



CAS2

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



Section 2. Subtest and Composite Scores

Subtest	Raw Score	Scaled Score PLAN	SIM	ATT	SUC
Planned Codes (PCd)	34	7			
Planned Connections (PCn)	145	8			
Planned Number Matching (PNM)	10	8			
Matrices (MAT)	20		10		
Verbal-Spatial Relations (VSR)	18		11		
Figure Memory (FM)	14		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
Sum of Subtest Scaled Scores		23	31	28	20	102
PASS Composite Index Scores		84	102	96	71	87
Percentile Rank		14	55	39	3	19
95% Confidence Interval Upper		92	108	104	87	92
95% Confidence Interval Lower		79	96	89	74	83

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CAS2

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

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.

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CAS2 Online Score & Report

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

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

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.

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CAS2 Online Score & Report

- Narrative report can be obtained in Word or PDF

CAS2 Cognitive Assessment System Second Edition

Scoring and Interpretive Report
Jack A. Naglieri

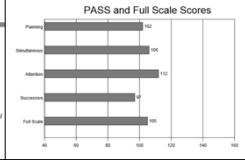
Name: Jack Nag
Age: 8
Gender: Male
Date of Birth: 07-12-2005
Grade: 5
School: East Lake

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

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.

PASS and Full Scale Scores



CAS2 Subtests

- Planned Codes
- Planned Connections
- Planned Number Matching

- Matrices
- Visual Spatial Relations
- Figure Memory

- Expressive Attention
- Number Detection
- Receptive Attention

- Word Series
- Sentence Repetition/Questions
- Visual Digit Span

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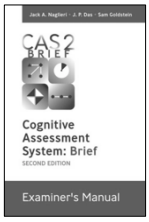
Structure and features

CAS2: BRIEF



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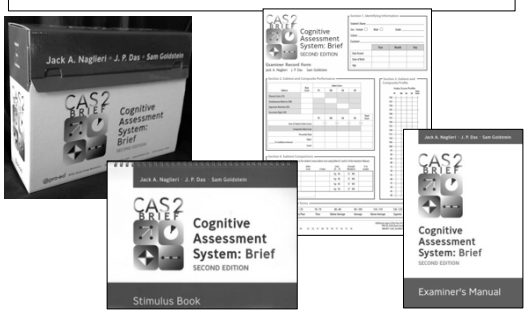
CAS2: Brief for Ages 4-18 years



CAS2: Brief

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

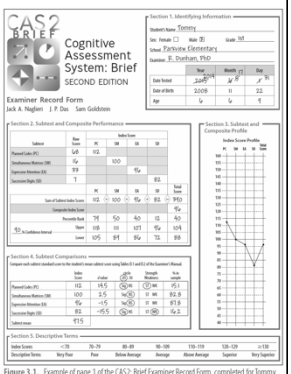


Figure 3.1. Example of page 1 of the *CAS2: Brief Examiner Record Form*, completed for Tommy.

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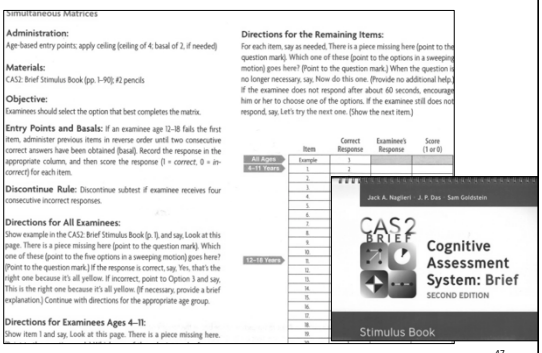
CAS2: Brief Simultaneous Matrices



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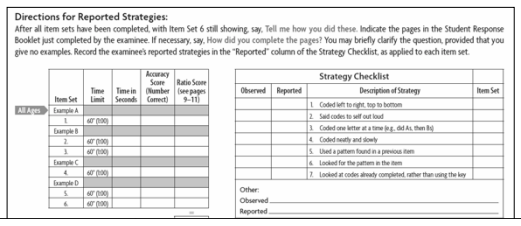
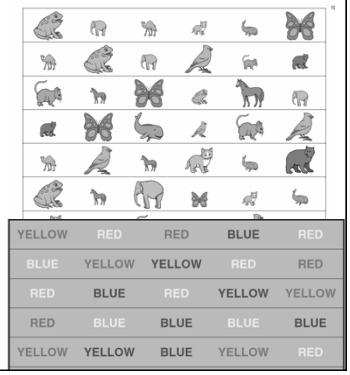
CAS2: Brief Planned Codes & Successive Digits

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



CAS2: Brief Scale

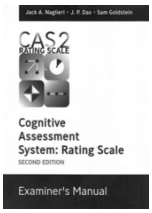
- Expressive Attention (Stroop) used
- Big/Little Animals (ages 4-7 years)
- Color Words (ages 8-18)



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

For TEACHERS

CAS2: RATING SCALE



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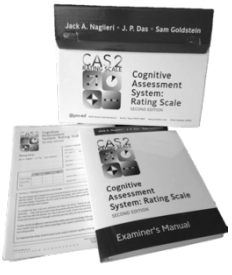
CAS2 Rating Scales (Ages 4-18 yrs.)

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



CAS2 Rating Scales

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

CAS2 Rating Scales

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

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

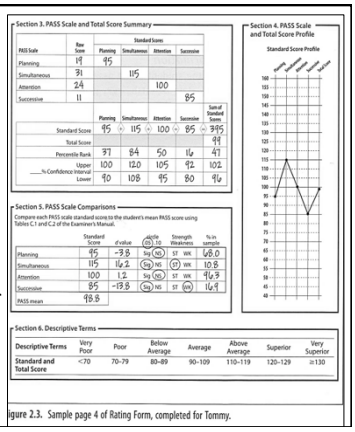
Directions for Items 11–20. These questions ask how well the child or adolescent sees how things go together. They also ask about working with diagrams and understanding how ideas fit together. The questions involve seeing the whole without getting lost in the parts. Please rate how well the child or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

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

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

CAS2 Rating Scales

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



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

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

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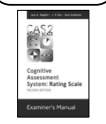
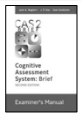
PASS Comprehensive System

(Naglieri, Das, & Goldstein, 2014)

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





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Race Differences

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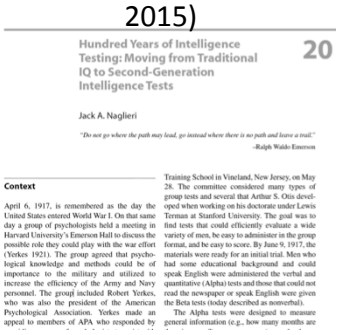
Evolution of IQ (Goldstein, & Naglieri, 2015)



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

20

Jack A. Naglieri

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

Context

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

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

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

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Race & IQ (Naglieri, 2015)

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

Brain-based PASS measured by CAS and CAS2 is most fair

Hispanic ELL Students with Reading Problems

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

Jack A. Naglieri
George Mason University
Tulio Otero
Columbia College, Elgin Campus
Brianna DeLauder
George Mason University
Holly Matto
Virginia Commonwealth University

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

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

J. A. Naglieri, Ph.D. George Mason Univ, Fairfax, VA 22030. naglieri@gmu.edu

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English Spanish CAS Summary

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

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Otero, Gonzales, Naglieri (2012)

- SLD and PASS scores

APPLIED NEUROPSYCHOLOGY: CHILD, 0: 1–9, 2012
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ISSN: 2162-2965 print/2162-2973 online
DOI: 10.1080/21622965.2012.670547

Psychology Press

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

Tulio M. Otero
Departments of Clinical Psychology and School Psychology, Chicago School of Professional Psychology, Chicago, Illinois

Lauren Gonzales
George Mason University, Fairfax, Virginia

Jack A. Naglieri
University of Virginia, Fairfax, Virginia

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

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

Naglieri, Rojahn, Matto (2007)

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

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

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

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

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

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

Abstract

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

Why PASS works across race, ethnicity, language, and culture

- It measures important basic neurocognitive processes
- It does not measure ability by tests that involve academic skills, that is no
  - Vocabulary
  - Arithmetic
  - Similarities
  - Comprehension
- All traditional IQ tests with verbal and quantitative tests are contaminated by knowledge
- IS VERBAL IQ REAL?

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Take Away Message

- The brain-based approach to defining important neuropsychological abilities is very different from traditional IQ.
  - CAS2 yields profiles for students with different exceptionalities
  - CAS2 yields the smallest race/ethnic differences
  - CAS2 scales are useful for instructional planning
  - CAS2 helps us better understand gender differences

A Brain-based view of neuropsychological ability called PASS

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Learning and Intelligence (PASS)

- Teachers know a lot about instructional methods
- But to help children learn, we have to know HOW CHILDREN LEARN
  - Difference instructional methods have different learning demands
- We have to understand how the brain functions to understand learning, and the role of PASS learning styles

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IQ defined by BRAIN function

- **PASS** theory is a modern way to define 'ability' based on measuring neurocognitive abilities
- **P**lanning = THINKING ABOUT THINKING
- **A**ttention = BEING ALERT
- **S**imultaneous = GETTING THE BIG PICTURE
- **S**uccessive = FOLLOWING A SEQUENCE

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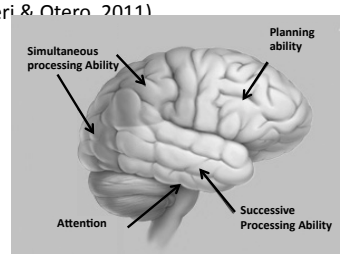
Brain, Cognition, & Intelligence

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

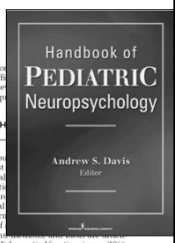
Naglieri, J. A. & Otero, T. (2011). Cognitive Assessment System: Redefining Intelligence from A Neuropsychological Perspective. In A. Davis (Ed.). *Handbook of Pediatric Neuropsychology (320-333)*. New York: Springer Publishing.



A Theory of Learning

28 Cognitive Assessment System: Redefining Intelligence From a Neuropsychological Perspective

Jack A. Naglieri and Tulio M. Otero



INTRODUCTION

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

Such tools should not os
cesses necessary for effe
also provide for the de
tions and address the qu

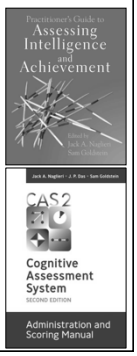
**FROM NEUROPSYCH
TO ASSESSMENT**

Luria's theoretical accou
perhaps one of the most
2008). Luria conceptual
of brain–behavior relati
orders that the clinician
the brain, the functional
syndromes and impairm
and clinical methods of
theoretical formulation,
lated in works such as *Higher cortical functions in man* (1966, 1980) and *The Working Brain* (1973). Luria viewed the brain as a functional mosaic, the parts of which interact in dif-

More on PASS and its Assessment

The Cognitive Assessment System

Jack A. Naglieri, Cara Conway



THEORY UNDERLYING THE CAS

The *Cognitive Assessment System (CAS)* (Naglieri & Das, 1997a) is a multidimensional measure of ability based on a cognitive and neuropsychological processing theory called *Planning, Attention, Simultaneous, and Successive (PASS)* (Naglieri, 1999a, 2005). The PASS theory described by Naglieri and Das (1997b, 2005) is a reconcepualization of intelligence largely, but not solely, based on the neuropsychological work of A. R. Luria (1966, 1973, 1980, 1982). The four processes that make up the PASS theory represent a blend of cognitive and neuropsychological constructs, such as executive functioning (Planning) and selective attention (Attention), including tests that in the past were often arguably described as nonverbal/visual-spatial (Simultaneous) and sequencing/memory (Successive) (Naglieri & Das, 2002).

The PASS theory is a different approach to understanding intelligence that not only the theory may have its roots in neuropsychology, "its branches are spread over developmental and educational psychology" (Varnhagen & Das, 1986, p. 130). Thus, with its connections to developmental and cognitive processing, the PASS theory offers an advantage in explanatory power over the notion of traditional general intelligence (Naglieri & Das, 2002).

PASS Defined

The four cognitive processes that make up the PASS theory are each associated with different brain regions, cognitive abilities, and behaviors (Naglieri, Conway, & Goldstein, 2007). The four processes of the PASS theory are described more fully below.

Planning is a mental activity that provides cognitive control, intentionality, organization, self-regulation and use of processes, knowledge, and skills. This includes self-monitoring and impulse control as well as generation, evaluation, and execution of a plan. This process may involve control over the other three processes, as well as

How to define neuropsychological abilities?

- How are the abilities identified?
  - Use factor analysis to discover ability?
  - Assign new labels to traditional IQ test subtests
  - Use the experimental literature to define the constructs of interest?
  - Rely on neuropsychological constructs

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What is a Neuropsychological Ability?

- The term neuropsychological ability is a modern term for concepts like cognition or intelligence
- The term neuropsychological ability is synonymous cognitive ability
- Neuropsychological abilities lead to the acquisition of knowledge and skills
  - Knowledge, like reading decoding or math calculation, are *not* examples of ability
  - these are sets of specific knowledge are acquired and/ or performed by the application of cognitive abilities.

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What is a Neuropsychological Ability?

- A specific neuropsychological ability provides a unique kind of function
- A variety of neuropsychological abilities are needed to meet the many demands of our complex environment
- A variety of neuropsychological abilities gives us a means of achieving the same goal using different types of or different combinations of abilities and knowledge (this is important for intervention planning).

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What is a Neuropsychological Ability?

- We must assess ability, achievement (knowledge) and skill separately.
- Assess achievement with tests that adequately evaluate the domain of interest (e.g., reading, math, etc.).
- Assess neuropsychological abilities using tasks free of academic content and related knowledge.
- Assess skill in real world activities.

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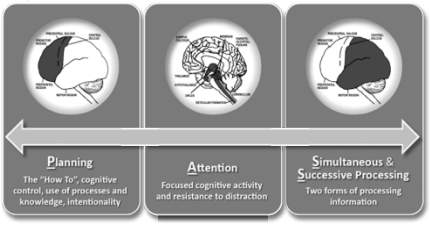
Ability or Knowled[illegible]

- What does the student have to **know** to complete a task?
  - This is dependent on *instruction*
- How does the student have to **think** to complete a task?
  - This is dependent on the *brain* – ***PASS***
- We must assess ability and achievement separately

The Brain as PASS

PASS: A neuropsychological approach to the Brain based on three Functional Units described by A. R. Luria (1972)



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PASS Theory: Planning

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

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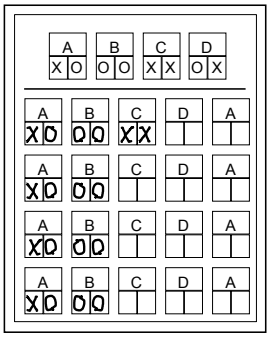
Planned Codes

- Child fills in the codes in the empty boxes
- Children are encouraged to think of a good way to complete the page



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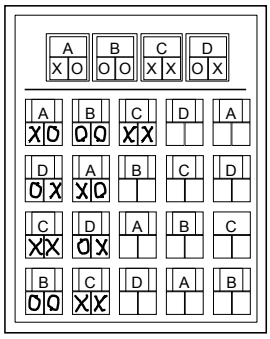
Planned Codes

- Page 2
- What is a good plan to complete this page?
- Note orientation



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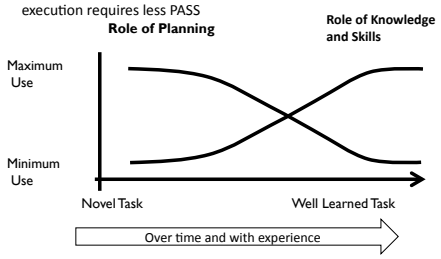
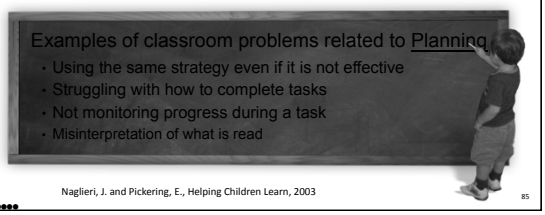
Knowledge and Planning Learning Curves

- Learning depends upon instruction and intelligence (PASS)
- At first, PASS plays a major role in learning
- When a new task is learned and practiced it becomes a skill and execution requires less PASS



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



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

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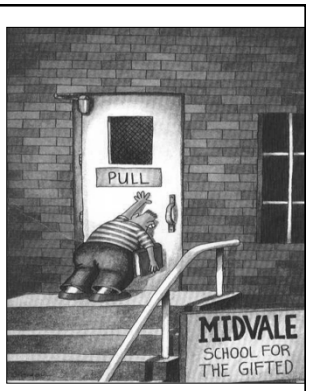
POOR PLANNING



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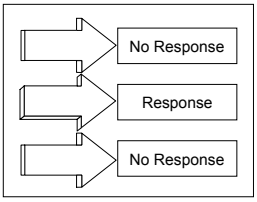
PASS Theory

- **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



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CAS2 Expressive Attention

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

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Expressive Attention - Italian

ROSSO	BLU	VERDE	GIALLO
GIALLO	VERDE	ROSSO	BLU
ROSSO	GIALLO	GIALLO	VERDE
BLU	VERDE	ROSSO	ROSSO
VERDE	GIALLO	BLU	GIALLO

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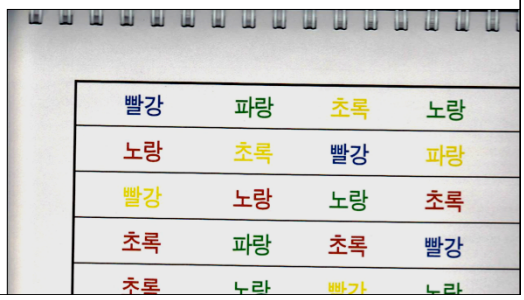
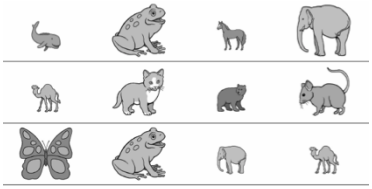
Expressive Attention – Korean CAS



Expressive Attention: 5-7 years

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



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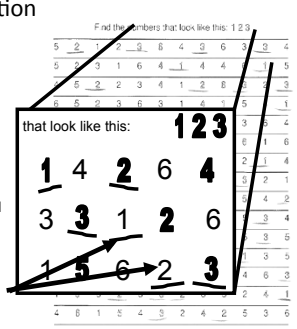
Number Detection

- Items 1 - 4 have 180 numbers on each page
- Each child is given two pages
- Targets appear at the top of the page
- Score for targets found and

false detections



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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.

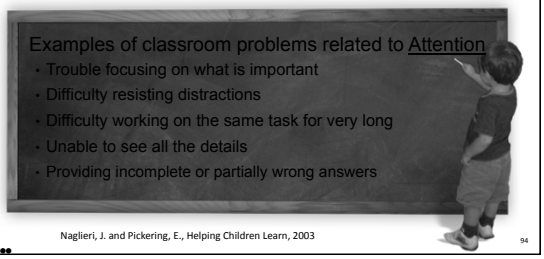
14. Lance fished from 6:00 A.M. to 9:45 A.M. How long did he fish?

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

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

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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

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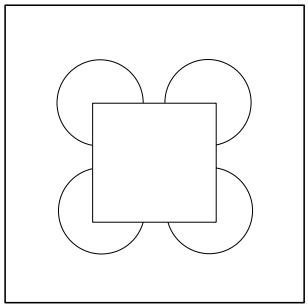
PASS Theory

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



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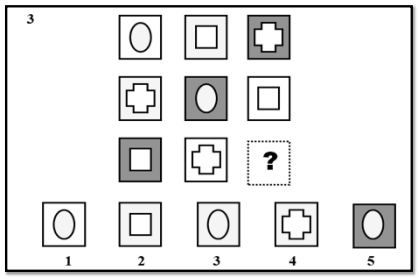
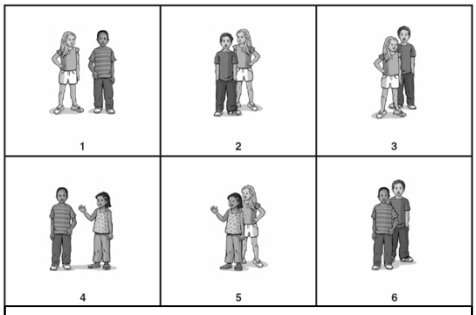
CAS2 Matrices

Child selects one of the options that best completes the matrix



97

CAS2 Verbal-Spatial Relations

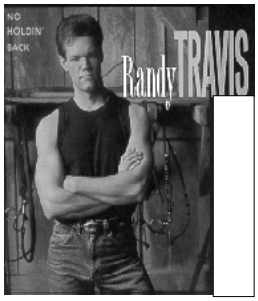


Which picture shows a boy behind a girl?

Simultaneous Verbal Task

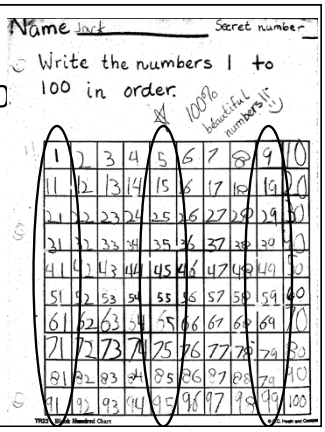
- Simultaneous processing using verbal content
- Who is this song about?

My momma's daddy was his oldest son.



Numbers from 1 to 100

How is … Simultaneous processing facilitated by this work sheet?



Simultaneous Processing at Work!

101

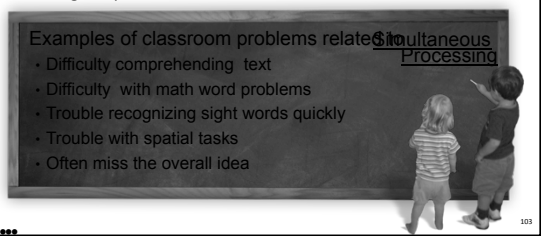
Simultaneous Processing at Work!

102

PASS Theory: Simultaneous

Simultaneous Processing

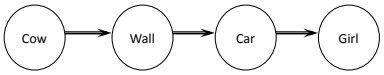
- Relate separate pieces of information into a group
- See how parts related to whole
- Recognize patterns



103

PASS 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



104

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

105

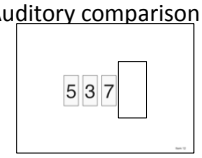
Sentence Repetition (Ages 5-7) or Sentence Questions (Ages 8-17)

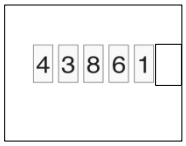
- Sentence Repetition
  - Child repeats sentences exactly as stated by the examiner such as:
  - The red greened the blue with a yellow.
- Sentence Questions
  - Child answers a question about a statement made by the examiner such as:
  - The red greened the blue with a yellow. Who got greened?

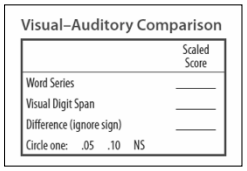
106

CAS2

- Visual Digit Span subtest allows for a Visual Auditory comparison



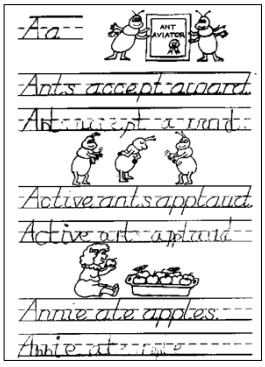




107

Successive

The sequence of the sounds is emphasized in this work sheet



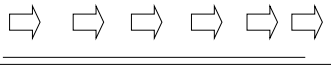
108

Learning Math Facts

8 + 9 = 1 7

8 + 9 = 1 7

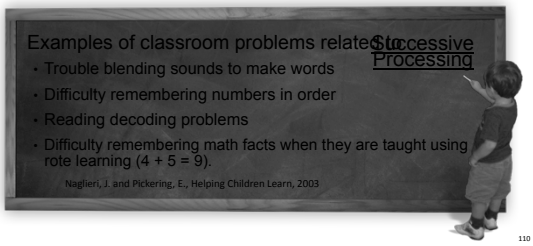
8 + 9 = 1 7



PASS Theory: Successive

Successive Processing

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



110

The Case of Larry – Age 8 Years 8 months

Linda M. Einhorn-Marcoux, M.A.,

Examiner & Intervention Instructor

Naglieri, J. A. (2006). 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.

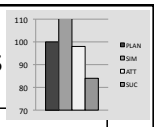
111

Case of Larry

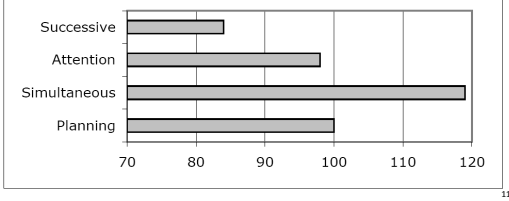
- Larry is a third grader who was evaluated at the request of his parents because of their concern about his chronic problems with spelling and written language
- Larry likes to read but he has spelling problems
- Larry frequently confused the letters b and d and often writes his numbers backwards and reads words backwards (mop as pom)
- Larry says certain words within his sentences out of order

112

Larry's PASS scores

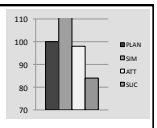


	Standard Score	Difference from Mean	
Planning	100	-0.25	-
Simultaneous	119	18.75	Strength
Attention	98	-2.25	-
Successive	84	-16.25	Weakness
Mean	100.25		



113

Larry



- Low achievement test scores
  - Letter Word Recognition 83
  - Written Expression 81
  - Word Attack 86
  - Decoding Fluency 81

- Meets the definition of SLD
  - "… a disorder in 1 or more of the basic psychological processes involved in understanding or in using language, spoken or written, which disorder may manifest itself in the imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations."

114

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 designed to improve the use of Successive processing strategies.
- Larry completed several homework assignments as a way of practicing the various rules and skills being taught

115

Larry'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.

Larry's Problem with Successive

- 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:

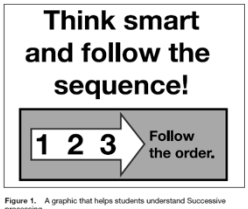


Figure 1. A graphic that helps students understand Successive processing.

Larry's Problem with Successive

- 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.

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Ben's Problem with Successive

Using Plans to Overcome Anxiety

Graphic Organizers for Connecting and Remembering Information

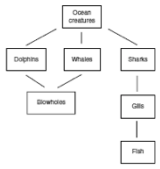


Figure 1. One kind of graphic organizer.

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

119

Larry's Problem with Successive

- Teach him to use strategies

Chunking for Reading/Decoding

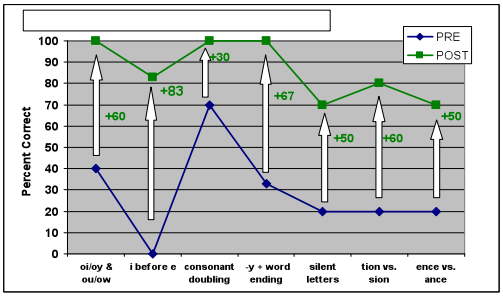
Segmenting Words for Reading/Decoding and Spelling

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 contair 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

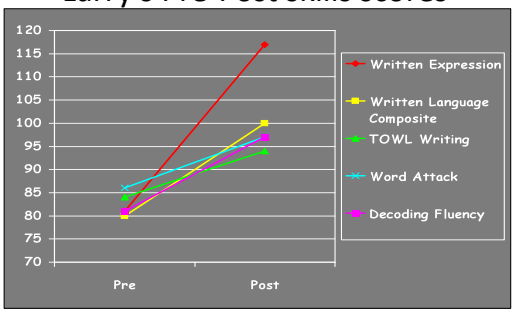
Segmenting words is an effective strategy to help students read and spell. By dividing the v

Larry's Pre-Post skills scores



121

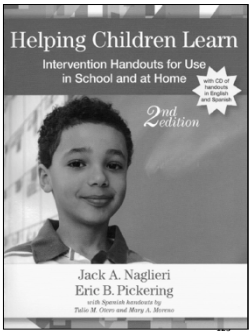
Larry's Pre-Post skills scores

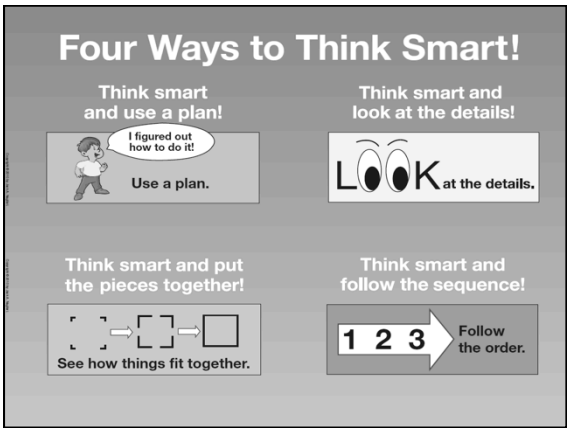


122

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.





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.

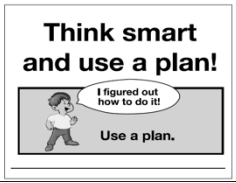
Step 1 – Talk with Students

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.

 jnaglieri@gmail.com

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.

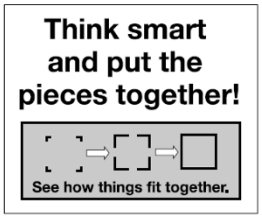


Figure 1. Picture for remembering to see the big picture.

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-

Helping Children Learn: Intervention Handouts for Use in School and at Home, Second Edition, by Jack A. Naglieri & Eric B. Pickering

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!

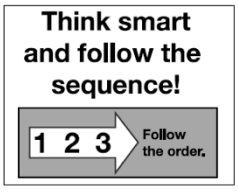


Figure 1. Picture for remembering to follow the sequence.

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 (Schell, 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 FRiSS 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

Teaching Students About Planning (continued)

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

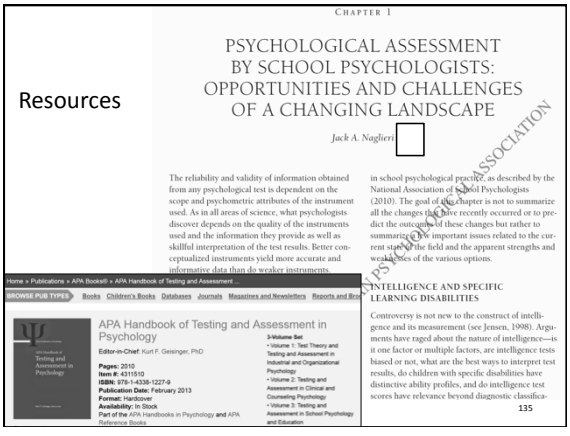
Pressley, M.P., & Woloshyn, V. (1995). *Cognitive strategy instruction that really improves children's academic performance* (2nd ed.). Brookline, MA: Brookline Books.
Schell, K. (1993). *Helping students become strategic learners*. Brookline, MA: Brookline Books.

Ability Test Profiles

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

This is essential for intervention planning

Resources



CHAPTER 1

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

Jack A. Naglieri

The reliability and validity of information obtained from any psychological test is dependent on the scope and psychometric attributes of the instrument used. As in all areas of science, what psychologists discover depends on the quality of the instruments used and the information they provide as well as skillful interpretation of the test results. Better conceptualized instruments yield more accurate and informative data than do weaker instruments.

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

INTELLIGENCE AND SPECIFIC LEARNING DISABILITIES

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

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APA Handbook of Testing and Assessment in Psychology

Editor-in-Chief: Kurt F. Geisinger, PhD

Pages: 2010
Item #: 4311510
ISBN: 978-1-4338-1227-9
Publication Date: February 2013
Format: Hardcover
Availability: In Stock
Part of the APA Handbooks in Psychology and APA Reference Books

3-Volume Set
- Volume 1: Test Theory and Testing and Assessment in Industrial and Organizational Psychology
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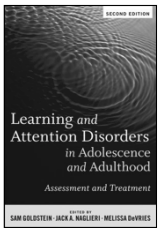
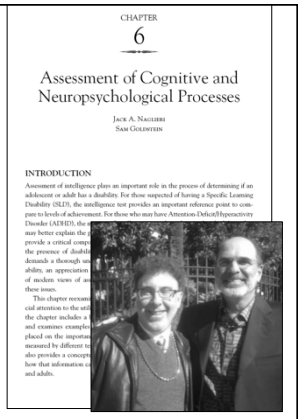
SLD Profiles by Ability Test





CHAPTER 6

Assessment of Cognitive and Neuropsychological Processes

JACK A. NAGLIERI
SAM GOLDSTEIN

INTRODUCTION

Assessment of intelligence plays an important role in the process of determining if an adolescent or adult has a disability. For those suspected of having a Specific Learning Disability (SLD), the intelligence test provides an important reference point to compare to levels of achievement. For those who may have Attention-Deficit/Hyperactivity Disorder (ADHD), the

Naglieri & Goldstein (2011)

GROUP PROFILES BY ABILITY TEST

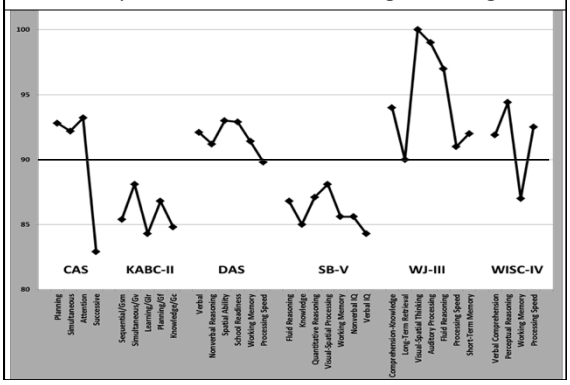
Because ability tests play such an important role in the diagnostic process, it is crucial to understand the sensitivity each test may have to any unique characteristics of those with an SLD or attention deficit. Clinicians need to know if an adolescent or adult has a specific deficit in ability that 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

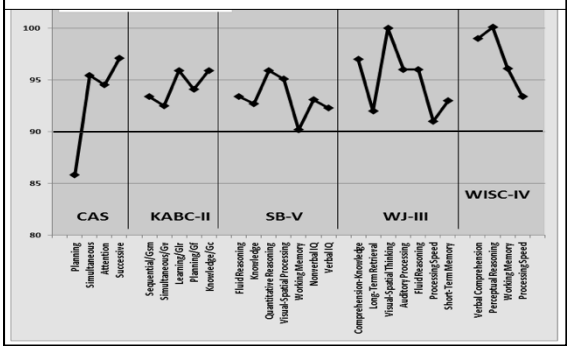
2. Subtest profile analysis is UNSUPPORTED so use scale profiles instead

Naglieri
(jnaglieri@gmail.c

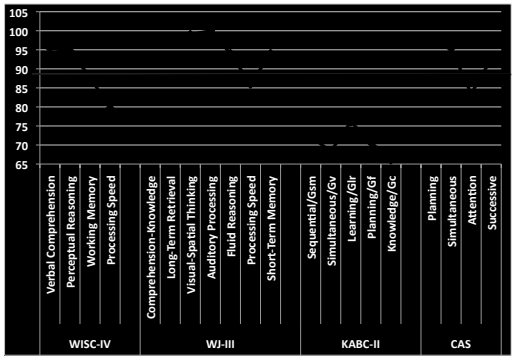
Comparison of Profiles: Reading Decoding



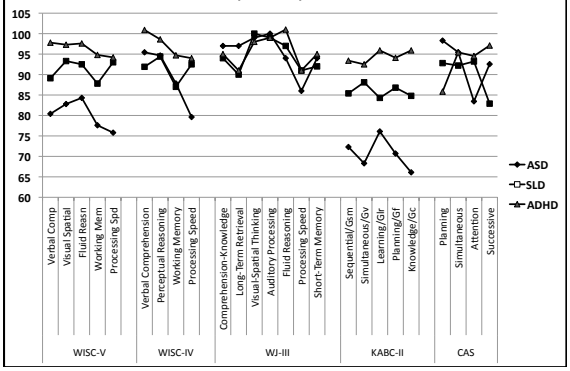
Comparison of Profiles: ADHD



Comparison of Profiles: Autism



ASD, SLD,ADHD



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

Journal of Psychoeducational Assessment
28(1) 19–30
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DOI: 10.1177/0734282909333057
http://jpa.sagepub.com
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Identifying Students With Learning Disabilities: Composite Profile Analysis Using the Cognitive Assessment System

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

Abstract

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

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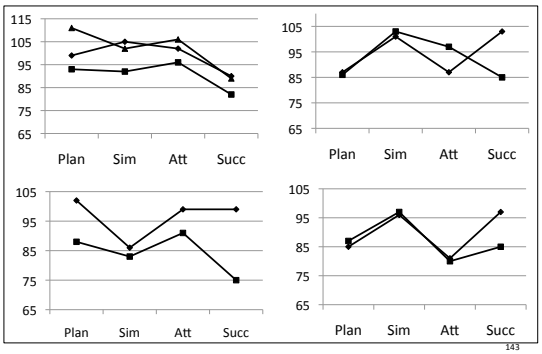
9 CAS Profiles



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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.

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Canivez & Gaboury (2010)

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

Cognitive Assessment System Construct and Diagnostic Utility in Assessing ADHD

Gary L. Canivez, Eastern Illinois University

Allison R. Gaboury, Pasadlag School District, Pasadlag, WA

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

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Ability & 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)

	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

CAS and Achievement

Journal of Educational Psychology
2004, Vol. 96, No. 1, 174–181

0022-0663/04/$12.00 DOI: 10.1037/0022-0663.96.1.174

Construct Validity of the PASS Theory and CAS: Correlations With Achievement

Jack A. Naglieri and Johannes Rojahn
George Mason University

The relationship among Planning, Attention, Simultaneous, and Successive (PASS) processing scores of the Cognitive Assessment System (CAS) and the Woodcock-Johnson Revised Tests of Achievement (WJ-R) were examined with a sample of 1,559 students aged 5–17 years. Participants were part of the CAS standardization sample and closely represented the U.S. population on a number of important demographic variables. Pearson product-moment correlation between CAS Full Scale and the WJ-R Skills cluster was .71 for the Standard and .70 for the Basic CAS Battery scores, providing evidence for the construct validity of the CAS. The CAS correlated with achievement as well if not better than tests of general intelligence. The amount of variance in the WJ-R scores the CAS accounted for increased with age between 5- to 13-year-olds. The 4 PASS scale scores cumulatively accounted for slightly more of the WJ-R variance than the CAS Full Scale score.

There are many ways in which the validity of a theory of cognitive ability may be evaluated. Psychologists often attempt to relate information about a child's cognitive characteristics to that child's academic performance. Because cognitive ability and academic achievement share a significant portion of the same construct, tests of cognitive ability should correlate with tests of academic achievement. This shared construct representation constitutes a basic type of construct validity (Messick, 1995). If there is a strong relationship between the results of a cognitive ability test and measures of academic achievement, we assume that whatever that test measures plays an important role in academic performance.

achievement. For instance, subtests like General Information are also included on individual achievement tests (e.g., the Peabody Individual Achievement Test—Revised; Markwardt, 1997). Similarly, the WISC-III Vocabulary and Similarities subtests require knowledge of words, which is also assessed by vocabulary or word analogy tests on, for example, the Stanford Achievement Test, Ninth Edition (SAT^9; 1995). The risk of circular reasoning is obvious. The recognition that this overlap in content is undesirable is not new (Boake, 2002) and has influenced the structure of tests such as the Kaufman Assessment Battery for Children (K-ABC; Kaufman & Kaufman, 1983) and the Naglieri Nonverbal Ability Test (N-NAT; Naglieri, 1997).

www.samgoldstein.com
www.MHS.com

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Sam Goldstein, Ph.D.
sam@samgoldstein.com

The Power Of Resilience

https://www.youtube.com/watch?v=isfw8JJ-eWM&feature=youtube_gdata