Executive Function: From Theory to Assessment and Effective Classroom Instruction

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Today's Session

- Introduce yourself to your neighbors
  - We will be discussing various topics today and you need to know who your talking to
    - Name (write it down so you remember)
    - Where they are from
    - What they do
    - Why they are here
    - Share a something about yourself relative to EF

Presentation Outline

- Comprehensive Model of EF
  - Historical Perspective
  - Definitions of Executive Function
- EF as Behavior
- EF as an Ability (an intelligence)
- EF as Social Emotional Skills
- Research about EF as ability, behavior, and SE
- **Think Smart!** -- EF Skills in the Classroom or Clinic
  - More lesson plans for improving components of EF
- Conclusions

Why this Workshop on EF?

- Executive Function (EF) is the most important ability we have, because it provides us **a way to decide how to do what we choose to do to achieve a goal**
- The best news is that EF **can be taught**
- Instruction that improves EF will affect children's ability to learn, their behavior, and their social skills.
- Improving EF will change a child's life

Executive Function Goals

- Today we will be *thinking about thinking*
- I will be teaching you *how* to help people learn to do the things they want to do
- The goal is to help students learn more by *encouraging them consider how they do what they decide to do*
- The goal is to engage the frontal lobes

EF Lesson on Saturday Night Live

- We will begin by learning about how EF can be taught to students, using one of the lessons in the project I'm working on
- The lessons teach aspects of EF and are structured as follows:
  - STEP 1 – View the video
  - STEP 2 – Discuss the video with the person sitting next to you.
  - STEP 3 – Share your ideas with everyone

EF Lesson on Saturday Night Live

- STEP 1 – View the video
- STEP 2 – Discussion of the video with someone sitting next to you.
- STEP 3 – Share your ideas with everyone

Time to Think and Talk

- **Task:**
- Talk with your partner(s)
- What was the main point ?
- Was the goal achieved ?
- Why was it so hard to get the students to think?
- Your own questions and thoughts..

START
120 seconds left
100 seconds left
80 seconds left
60 seconds left
40 seconds left
20 seconds left
STOP

History Class: Saturday Night Live

- STEP 1 – View the video
- STEP 2 – Discussion of the video with someone sitting next to you.
  - Consider:
    - What was the main point ?
    - Was the goal achieved ?
    - What did the teacher do wrong ?
    - Your own questions and thoughts..
- STEP 3 – Share your ideas with everyone

History Class: SNL

Metacognition

The ability to think about your thinking

Phrase of the week: Are you thinking about thinking?

Watch Seinfeld History Lesson Video:
http://www.schooltube.com/video/30747e2e060f4e4efc5b/

1. Why was the teacher frustrated in the video?
2. What could the students in the video have done differently?
3. Why was it so hard for the students to think about history?
4. Do you think about how you're doing your work *while* you are actually doing it?

Wrap-Up:

This week whenever you are stuck, you must describe to the teacher what you did. How you got to where you are?
This is an example of being aware of what you're thinking, sometimes called "self-monitoring". Write in your notebook how you think this could benefit you.

History Class: Student Comments

- 'The teacher was frustrated because the students weren't thinking about what he was saying'
- 'They should have paused before responding so that they could think'
- 'When you feel pressure you'll say anything if you don't know the answer'

History Class: Student Comments

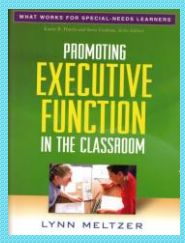
- 'The way teachers run the class stops you from thinking because they tell you there is only one way to do something – but it's a fact that there is more than one way to solve a problem'
- 'That's what I like about this class, there are different ways to solve the problems'
- 'We need to know why the teacher is getting us to learn history'

History Class: Saturday Night Live

- Teach students to think not just remember
- How to learn is just as important as what to learn
- This is what Executive Function is all about
- This is the theme of today's workshop

Meltzer (2010)

- 'Classroom instruction generally focuses on content (or the *what to know)*, rather than on the *how to do or learn…*and does not address metacognitive strategies that teach students to think about *how* they think and learn'.



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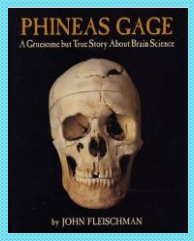
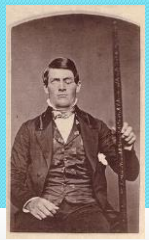
The Curious Story of Phineas Gage

John Fleischman's book "Phineas Gage: A Gruesome but True Story About Brain Science" is an excellent source of information about this person, his life, and how this event impacted our understanding of how the brain works; and particularly the frontal lobes.



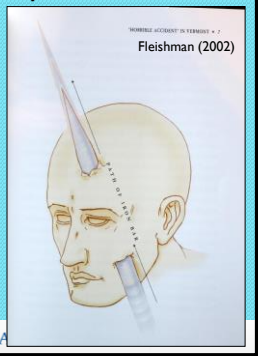
The Curious Story of Phineas Gage

- September 13, 1848 26 year old Phineas Gag was in charge of a railroad track construction crew blasting granite bedrock near Cavendish, Vermont
- The job Phineas has is to use a "tamping iron" to set explosives
- The tamping iron is a rod about 3 ½ feet long weighing 13 ½ lbs pointed at one end



Fleishman (2002, p 70)

- From Damaiso (1994) article in *Science*
- The rod passed through the left frontal lobe, between the two hemispheres, then to left hemisphere
- The damage was to the front of the frontal cortex more than the back, and the underside more than the top



Before . . . & . . . After

- **Before** the accident 'he possessed a well-balanced mind, was seen as a shrewd, smart business man, very energetic and persistent in executing all his plans of operation' (p 59)
- **After** the accident his ability to direct others was gone, he had considerable trouble with decision making, control of impulses and interpersonal relationships – management of intellect, behavior and emotion

A Bit of EF Neuroanatomy

- The case of Phineas Gage led to a better understanding of the frontal lobes; in particular the pre-frontal cortex.
- Rich cortical, sub-cortical and brain stem connections.

More Specifically

- The dorsolateral prefrontal cortex is involved with the ability to plan, shift set, organize remember and solve novel problems.
- That is: planning and decision making, self monitoring, self correction, especially when responses are not well-rehearsed or contain novel sequences of actions.

The Curious Story of Phineas Gage

The Skull of Phineas Gage is at Harvard's Warren Anatomical Museum

The skull of Phineas Gage

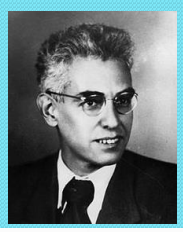
The skull of Phineas Gage, along with the tamping iron which did the damage. On display at Harvard's Warren Anatomical Museum.

Frontal Lobes and Executive Function(s)

What do we mean by the term Executive Function(s)?

Executive Function (s)

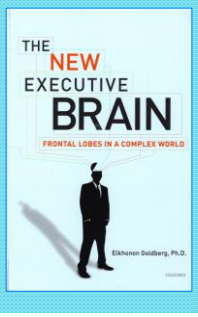
- In 1966 Luria first wrote and defined the concept of Executive Function (EF)
- He credited Bianchi (1895) and Bekhterev (1905) with the initial definition of the process



1902 - 1977

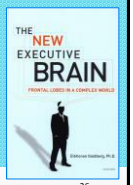
Executive Functions

- Elkhonon Goldberg provides a valuable review of what the frontal lobes do
- Describes EF as the orchestra leader



Goldberg (2009, p. 4)

- "The frontal lobes … are liked to intentionality, purposefulness, and complex decision making."
- They make us human, and as Luria stated, are "the organ of civilization"
- Frontal lobes are about …"leadership, motivation, drive, vision, self-awareness, and awareness of others, success, creativity, sex differences, social maturity, cognitive development and learning…"



What is Executive Function(s)

There is no formal excepted definition of EF

- We typically find a vague general statement of EF (e.g., goal-directed action, cognitive control, top-down inhibition, effortful processing, etc.).
- Or a listing of the constructs such as
  - Inhibition,
  - Working Memory,
  - Planning,
  - Problem-Solving,
  - Goal-Directed Activity,
  - Strategy Development and Execution,
  - Emotional Self-Regulation,
  - Self-Motivation

Goldstein, Naglieri, Princiotta, & Otero (2013)

- Executive function(s) has come to be an umbrella term used for many different "abilities": planning, working memory, attention, inhibition, self-monitoring, self-regulation and initiation carried out by pre-frontal areas of the frontal lobes.
- We found more than 30 definitions of EF(s)

What is Executive Function(s)

1. Barkley (2011): "EF is thus a **self-directed set of actions**)" (p. 11).
2. Dawson & Guare (2010): "Executive skills allow us **to organize our behavior over time**" (p. 1).
3. Delis (2012): "Executive functions reflect the **ability to manage and regulate one's behavior** (p. 14).

What is Executive Function(s)

4. Denckla (1996): "EF (is) a set of **domain-general control processes**…" (p. 263).
5. Gioia, Isquith, Guy, & Kenworthy (2000): "a **collection of processes that are responsible for guiding, directing, and managing cognitive, emotional, and behavioral functions**" (p. 1).

What is Executive Function(s)

6. Pribram (1973): "**executive programmes …to maintain brain organization** " (p. 301).
7. Roberts & Pennington (1996): EF "**a collection of related but somewhat distinct abilities such as planning, set maintenance, impulse control, working memory, and attentional control**" (p. 105).

What is Executive Function(s)

6. Stuss & Benson (1986): "**a variety of different capacities that enable purposeful, goal-directed behavior, including behavioral regulation, working memory, planning and organizational skills, and self-monitoring**" (p. 272).
7. Welsh and Pennington (1988): "the **ability to maintain an appropriate problem-solving set for attainment of a future goal**" (p. 201).

What is Executive Function(s)

10. McCloskey (2006): "a **diverse group of highly specific cognitive processes collected together to direct cognition, emotion, and motor activity,** including …the **ability to engage in purposeful, organized, strategic, self-regulated, goal directed behavior**" (p. 1)…

"think of executive functions as a set of independent but coordinated processes rather than a single trait" (p. 2).

What is Executive Function(s)

10. Lezak (1995): "**a collection of interrelated cognitive and behavioral skills that are responsible for purposeful, goal-directed activity**," …
11. "**how and whether a person goes about doing something**" (p. 42).
12. Luria (1966): "… **ability to correctly evaluate their own behavior and the adequacy of their actions**" (p. 227).

Executive Function	Executive Functions
➢ EF has is a **unitary** construct (Duncan & Miller, 2002; Duncan & Owen, 2000). ➢ EF is **unidimensional** in early childhood not adulthood.	➢ EF has **three components**: *inhibitory control, set shifting (flexibility), and working memory* (e.g., Davidson, et al., 2006). ➢ Executive Functions is a **multidimensional** model (Friedman et al., 2006) with independent **abilities** (Wiebe, Espy, & Charak, 2008).
➢ Both views are supported by some research (Miyake et al., 2000) EF is a **unitary construct … but with partially different components**.	

Executive Function(s)

➢ Given all these definitions of EF(s) we wanted to address the question…

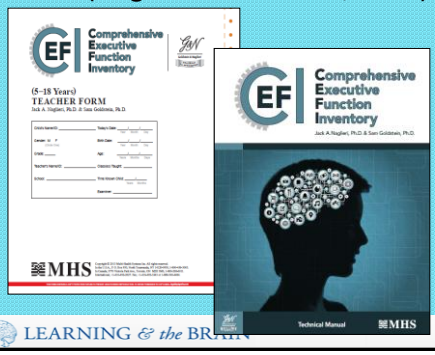
Executive Function***s …*** or

Executive Function?

Executive Function(s)

- One way to examine this issue is to research the factor structure of behaviors related to EF(s)
- To do so, we examined the factor structure of the Comprehensive Executive Function Inventory (CEFI)
- We conducted a series of research studies to answer the following question:
  - What is the underlying structure of the behaviors assessed on the CEFI?
  - Is there is just one underlying factor called executive function), or do the behaviors group together into different constructs suggesting a multidimensional structure?

CEFI (Naglieri & Goldstein, 2012)



CEFI Parent Rating Scale (Ages 5-18)

CEFI Teacher Rating Scale (Ages 5-18)

CEFI Self-Rating Scale (Ages 12-18)

CEFI Full Scale (100 items)

1. Attention
2. Emotion Regulation
3. Flexibility
4. Inhibitory Control
5. Initiation
6. Organization
7. Planning
8. Self-Monitoring
9. Working Memory

1. Consistency Index
2. Negative Impression
3. Positive Impression

Exploratory Factor Analyses

- The normative samples for parents, teacher, and self ratings were randomly split into two samples and EFA conducted using
  - the item raw scores
  - nine scales' raw scores
- The sample …

CEFI Scales
Attention
Emotion Regulation
Flexibility
Inhibitory Control
Initiation
Organization
Planning
Self-Monitoring
Working Memory

CEFI Standardization Samples

- Sample was stratified by
  - Sex, age, race/ethnicity, parental education level (PEL; for cases rated by parents), geographic region
  - Race/ethnicity of the child (Asian/Pacific Islander, Black/African American/African Canadian, Hispanic, White/Caucasian, Multi-racial by the rater
  - Parent (N=1,400), Teacher (N=1,400) and Self (N=700) ratings were obtained

Item Factor Analyses – Part 1

90 Item factor analysis clearly indicted that one factor was the best solution

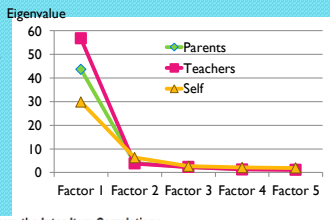


Table 8.2. Eigenvalues from the Inter-Item Correlations

	Factor						
Form	1	2	3	4	5	6	7
Parent	43.7	4.1	2.3	1.5	1.3	1.3	1.0
Teacher	56.8	3.8	2.3	1.3	1.1	1.1	0.8
Self-Report	29.9	6.3	2.7	2.1	1.9	1.8	1.5

Note. Extraction ropal Axis Factoring. Only the first 10 eigenvalues are presented.

Item Factor Analyses – Part 1

EFA for item groups: Attention, Emotion Regulation, Flexibility, Inhibitory Control, Initiation, Organization, Planning, Self-Monitoring, and Working Memory scales

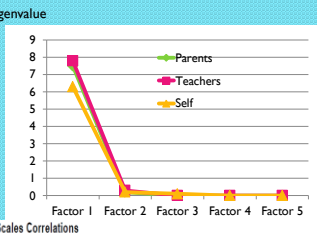


Table 8.4. Eigenvalues of the CEFI Scales Correlations

	Factor						
Form	1	2	3	4	5	6	7
Parent	7.5	0.2	0.0	0.0	0.0	0.0	0.0
Teacher	7.8	0.3	0.0	0.0	0.0	0.0	0.0
Self-Report	6.3	0.2	0.1	0.0	0.0	0.0	-0.1

Note. Extraction method: Prig.

43

Exploratory Factor Analyses

Table 8.6. Consistency of Factor Loadings Across Groups

Grouping Factor	CEFI Form	Coefficient of Congruence
Gender	Parent	.999
	Teacher	.999
	Self-Report	.992
Race/ Ethnic Group	Parent	.996
	Teacher	.999
	Self-Report	.995
Age	Parent	.999
	Teacher	.999
	Self-Report	.995
Clinical/ Educational	Parent	.993
	Teacher	.994
	Self-Report	.976

Nearly identical factor solutions (ALL ONE FACTOR) by Gender, Race/Ethnic, Age and Clinical/typical status

LEARNING & the BRAIN

44

Exploratory Factor Analyses

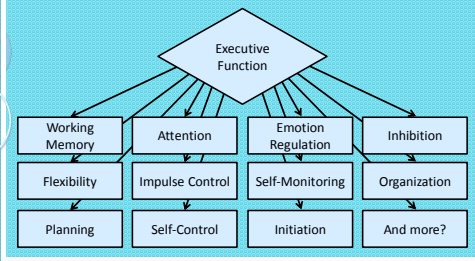
- Conclusions
  - When using parent (N = 1,400), teacher (N = 1,400), or self-ratings (N = 700) based on behaviors observed and reported for a nationally representative sample (N = 3,500) aged 5 to 18 years Executive Function *not* functions is the best term to use

LEARNING & the BRAIN

45

EF and its components

- Abilities, cognitive processes, and behaviors

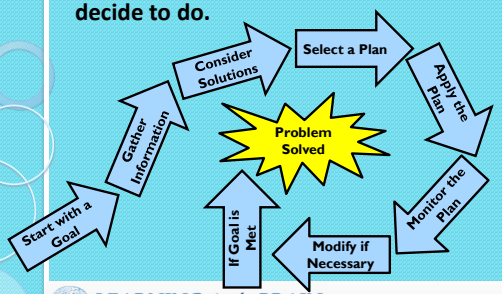


LEARNING & the BRAIN

46

Naglieri & Goldstein, 2012

- Executive Function is: ***how*** **you do what you decide to do.**

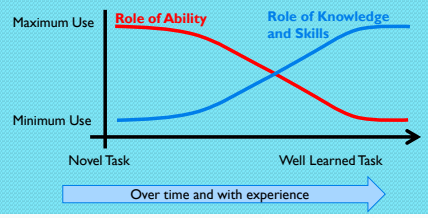


LEARNING & the BRAIN

47

EF's Learning Curves

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



LEARNING & the BRAIN

Executive Function Involves

- ***"How* you decide *what* to do" demands…**
  - **Initiation** to achieve a goal, **planning** and **organizing** parts of a task, **attending** to details to notice success of the solution, keeping information in **memory,** having **flexibility** to modify the solution as information from **self-monitoring** is received and demonstrating **emotion regulation** (which also demands **inhibitory control)** to ensure clear thinking so that the task is completed successfully.

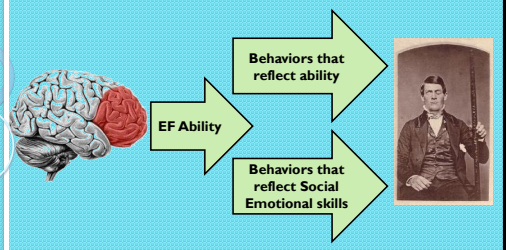
Time to Think and Talk

- We have covered the structure of behaviors related to Executive Function
- TALK TO YOUR NEIGHBORS about
  - What thoughts do you have about what has been presented
  - Any surprises?
  - Any concern?
  - Any questions?

EF: ability, behavior, social-emotional skill?

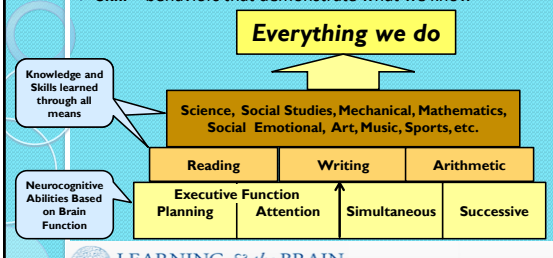
All are reflections of FRONTAL LOBE activity

EF Ability, Behavior, Social-Emotional



EF, Ability, Knowledge & Skills

- **Ability (aka intelligence)** = Abilities the brain provides
- **Knowledge** = all the information we have
- **Skill** = behaviors that demonstrate what we know



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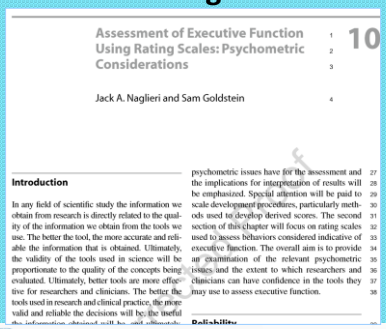
A look at some EF Rating Scales

From Handbook of Executive Function (Goldstein & Naglieri, 2014)

EF Rating Scales

- Measures real world behavior
- Able to sample multiple sources (self, parents, teachers)
- Efficient ways to evaluate EF
- However
  - self-ratings may be limited by impaired self-awareness
  - Observers may not be good at observing !
  - The quality of EF rating scales varies considerably

Review of Rating Scales



10

Assessment of Executive Function Using Rating Scales: Psychometric Considerations

Jack A. Naglieri and Sam Goldstein

Introduction

In any field of scientific study the information we obtain from research is directly related to the quality of the information we obtain from the tools we use. The better the tool, the more accurate and reliable the information that is obtained. Ultimately, the validity of the tools used in science will be proportionate to the quality of the concepts being evaluated. Ultimately, better tools are more effective for researchers and clinicians. The better the tools used in research and clinical practice, the more valid and reliable the decisions will be; the useful

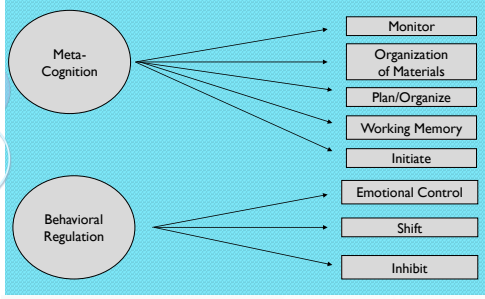
psychometric issues have for the assessment and the implications for interpretation of results will be emphasized. Special attention will be paid to scale development procedures, particularly methods used to develop derived scores. The second section of this chapter will focus on rating scales used to assess behaviors considered indicative of executive function. The overall aim is to provide an examination of the relevant psychometric issues and the extent to which researchers and clinicians can have confidence in the tools they may use to assess executive function.

Reliability

Behavior Rating Inventory of Executive Functioning (BRIEF)

- High internal consistency (alphas = .80 -.98) and test-retest reliability (rs = .82 for parents, .88 for teachers) were found.

Structure of the Brief



Behavior Rating Inventory of Executive Functioning (BRIEF)

STANDARDIZATION

Demographic Characteristics

The goal of the sampling procedure for the normative group was to approximate the population of the United States according to key demographic variables: gender, socioeconomic status (SES), ethnicity, age, and geographical population density. The normative data samples were obtained through public and private school recruitment in urban, suburban, and rural settings in the State of Maryland, which has a full range of ethnicities, socioeconomic classes, and population densities. A total of 25 schools were sampled, including 12 elementary, 9 middle, and 4 high schools. A small subgroup of ratings of adolescents (n = 18) was obtained from the normal control group in a study of patients with traumatic brain injury at Case Western Reserve University in Cleveland, Ohio (Turkstra, 2000).

Educational Attainment

Annual averages of Educational Attainment by State for persons 25 years old and over based on 2000 Census (American National Standards Institute)

	State	2009 High school graduate or more	2009 Bachelor's degree or more	2009 Advanced degree or more
	United States	85.3	27.9	10.3
1	Massachusetts	89.0	38.2	16.4
2	Maryland	88.2	35.7	16.0
3	Connecticut	88.6	35.6	15.5
4	Virginia	86.6	34.0	14.1
5	New York	84.7	32.4	14.0
6	Vermont	91.0	33.1	13.3
7	New Jersey	87.4	34.5	12.9
8	Colorado	89.3	35.9	12.7
9	Illinois	86.4	30.6	11.7
10	Rhode Island	84.7	30.5	11.7

Median household income for the US is $50,022 and for Maryland is $64,596

BRIEF-Adolescent (N=1,118)

STANDARDIZATION

Demographic Characteristics of the Normative Sample

The goal of the sampling procedure for the normative group was to approximate the U.S. population according to key demographic variables: age, gender, race/ethnicity, parent education, and geographical population density. The normative data samples were obtained through public and private school recruitment in urban, suburban, and rural settings in Maryland, Ohio, Vermont, New Hampshire, Florida, and Washington state. Combined, these environments offer a full range of races/ethnicities, socioeconomic classes, and population densities.

Delis-Rating of Executive Function

D-REF Delis Rating of Executive Functions

Delis-Rating of Executive Function (D-REF)

Author(s): Dean C. Delis

A quick measure of an individual's behaviors related to executive function difficulties

At a Glance:

Administration: On-line (paper available)
Completion Time: 5-10 minutes per form
Scores: T scores; Composite level
Report Options: Single rater parent, teacher, or child reports; multiple rater reports, progress monitoring report
Qualification level: B-Level
Publication Date: 2012
Ages / Grades: Individuals 5–18 years old
Reading Level: 4th grade

Standardization Sample

- Manual states that the samples (Parent Raters N = 500; Teacher Raters N = 342; Self Ratings N = 220) are representative of the US population (ages 5-18 years)

Description and Representativeness of the Sample

The D-REF normative data are based on national samples representative of the U.S. population ages 5–18 years. Tables 3.1, 3.2, and 3.3 provide a comparison of the sample demographics to U.S. census targets for the Parent, Teacher, and Self rating forms. An analysis of data gathered in 2010 by the U.S. Bureau of the Census provided the basis for stratification according to the following variables: age, sex, race/ethnicity, and education level. All examinees were

Parent Form (N = 500)

Demographic Characteristics of the Normative Sample by Parent Education Level, Race/Ethnicity, Geographic Region, and Sex, by Age Group: Parent Form

	Parent Form											
	Age											
	5–6		7–8		9–10		11–12		13–14		15–18	
	Sample (%)	U.S. Pop.[a] (%)	Sample (%)	U.S. Pop.[a] (%)	Sample (%)	U.S. Pop.[a] (%)	Sample (%)	U.S. Pop.[a] (%)	Sample (%)	U.S. Pop.[a] (%)	Sample (%)	U.S. Pop.[a] (%)
Parent Education Level												
Grade 11 or Less	13.0	11.7	11.0	11.7	8.6	10.7	5.7	10.4	6.7	10.2	10.0	9.8
High School or GED	23.0	24.1	25.0	26.0	28.6	26.5	27.1	25.7	25.0	26.9	27.0	26.1
Post Secondary	64.0	64.2	64.0	62.3	62.9	62.8	67.1	64.0	68.3	62.8	63.0	64.0
Race/Ethnicity												
African American	29.0	12.7	26.0	13.5	8.6	13.1	12.9	14.0	16.7	14.3	6.0	14.3
Hispanic	20.0	24.7	18.0	23.5	17.1	23.0	20.0	20.2	10.0	19.7	30.0	18.2
White	47.0	54.3	50.0	54.8	67.1	56.7	57.1	58.3	70.0	58.1	57.0	60.4
Other[b]	4.0	8.3	6.0	8.3	7.1	7.3	10.0	7.5	3.3	7.9	7.0	7.1
Geographic Region												
Northeast	31.0	15.8	37.0	17.3	12.9	16.7	5.7	16.8	1.7	18.6	8.0	17.6
Midwest	6.0	21.2	8.0	21.9	30.0	22.2	25.7	21.3	21.7	21.4	2.0	22.8
South	51.0	38.1	37.0	36.5	38.6	37.3	64.3	38.3	76.7	36.0	84.0	36.6
West	12.0	25.0	18.0	24.3	18.6	23.8	4.3	23.6	–	24.0	6.0	22.9
Sex												
Female	56.0	48.9	48.0	49.4	50.0	49.2	51.4	48.1	45.0	48.7	52.0	48.7
Male	44.0	51.1	52.0	50.6	50.0	50.8	48.6	51.9	55.0	51.3	48.0	51.3

Barkley's EF Scale

Barkley Deficits in Executive Functioning Scale—Children and Adolescents (BDEFS-CA)

Russell A. Barkley

Barkley's EF Scale

The breakdown in educational categories for the parent respondents in comparison with the 2000 U.S. Census (*www.census.gov*) is shown in the following:

Education category	Normative sample	U.S. Census
Less than high school	4.1%	19.1%
High school (diploma or equivalency)	28.1%	28.6%
Some college, no degree	20.6%	21.0%
Associates degree	9.2%	6.3%
Bachelor's degree	22.5%	15.5%
Graduate degree	15.4%	8.9%

The present sample is generally comparable to the U.S. population in the percentage having high school diplomas or equivalency, some college, or associate's degrees but has a slight overrepresentation of individuals with bachelor's or graduate degrees. The sample also contains a lower percentage of those having less than a high school education than appear in the U.S. Census. The breakdown of educational levels of the nonrespondent parents follows: less than high school, 6.6%; high school, 20.6%; some college, no degree, 20.6%; associate's degree, 10.2%; bachelor's degree, 22.8%; graduate degree, 14.8%. These percentages are very similar to those for the respondent parents. The mean educational level for the children in the sample was 7.4 years ($SD = 3.5$, range = kindergarten [1] to 12th grade [13]), or roughly a mid-6th-grade education.

LEARNING & the BRAIN 67

Importance of a National Norm

- What is the problem with not scores based on a sample that is not representative of the U.S. populations?
  - You don't know how much the score you get is influenced by demographic variables
  - Let's look at some data …
- I created norms for groups of children based on PEL levels to see just how much influence this variable could have on a standard score (Mean = 100, SD = 15)

LEARNING & the BRAIN 68

Importance of a National Norm

Calibration of Standard Scores (Mn = 100; SD = 15) Across Parental Educational Levels for CEFI Parent Ratings.

Raw Score	Standard Scores				
	<HS	HS Grad	Some Coll	Coll Grad	National
230	96	91	88	85	90
235	97	9[illegible]	[illegible]9	87	91
240	98	93	90	88	92
245	99	95	92	89	93
250	100	96	93	90	94
255	101	97	94	92	95
260	102	98	95	93	97
265	103	99	96	94	98
270	104	100	98	95	99
275	105	10[illegible]	99	96	100
280	106	102	100	98	101
285	107	103	101	99	102
290	108	105	102	100	103
295	109	106	103	101	105
300	110	107	105	103	106
305	111	108	106	104	107
310	112	109	107	105	108
315	113	110	108	106	109

10 points

8 points

LEARNING & the BRAIN 69

Time to Think and Talk

- We have covered the ***size of the reference groups when scaling*** behaviors related to Executive Function
- TALK TO YOUR NEIGHBORS about
  - What thoughts do you have about what has been presented
  - Any surprises?
  - Any concern?
  - Any questions?

LEARNING & the BRAIN 70

Comprehensive Executive Function Inventory (CEFI)

Jack A. Naglieri
Sam Goldstein

A rating scale designed to measure behaviors association with Executive Function for ages 5-18 years rated by a parent, teacher, or the child/youth.

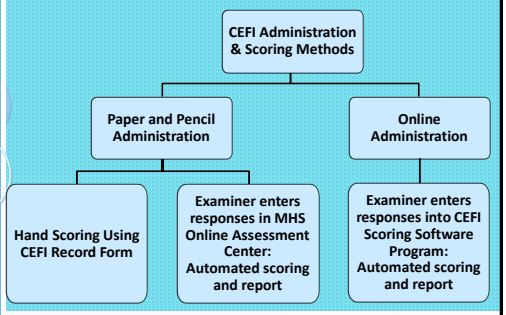
LEARNING & the BRAIN 71

CEFI Normative Samples

- 1,400 ratings by Parents for children aged 5-18 years
- 1,400 ratings by Teachers for children aged 5-18 years
- 700 ratings from the self-report form for those aged 12-18 years
- There were equal numbers of ratings of or by males and females
- Stratified according to the 2009 US Census by race/ethnicity, parental education, region, age, and sex

LEARNING & the BRAIN 72

CEFI Administration & Scoring



CEFI Forms

- The Comprehensive Executive Function Inventory (CEFI) measures behaviors associated with Executive Function (EF) for ages 5 to 18 years.
- The CEFI is completed by a parent, teacher, or the child/youth.
- Each form yields a **Full Scale** score and 9 separate content scales

CEFI Scales
Attention
Emotion Regulation
Flexibility
Inhibitory Control
Initiation
Organization
Planning
Self-Monitoring
Working Memory

One Factor and 9 Scales?

- NOTE: EF is a unidimensional concept
- Use the Full Scale to answer the question "Is the child poo
- Use the specific groups of items that represent 9 different types of behaviors that can be addressed by Intervention

If a problem with Inhibitory Control

CEFI Scales
Attention
Emotion Regulation
Flexibility
Inhibitory Control
Initiation
Organization
Planning
Self-Monitoring
Working Memory

Efintheclassroom.net

Response Inhibition

Question of the week: Can you resist the urge to respond?

Marshmallow Experiment

1. Which of the kids reminds you of you and why?
2. When do you need to think before you act?
3. When is a small immediate reward better than a big long term reward.
4. When do you not need to think before you act?

Wrap-Up: This week we are going to resist the urge to act before we should.
Have the students talk about when they chose what gives a long term gain rather than the short term reward.

Time to Think and Talk

- **Task:**
- Talk with your partner(s)
  - **When do you need to think before acting?**
  - **When is it better to wait?**

START	120 seconds left
	100 seconds left
	80 seconds left
	60 seconds left
	40 seconds left
	20 seconds left
	STOP

Q: When do you need to think before acting?

- "All the time"
- "Like when your friend asks you to do something bad, you have to think on it"
- "We often act on impulse – I do that all the time"
- "There are certain things you just do without thinking – like when you hear a shot you run in swivels"

Q: When is it better to wait?

- "But it's worth it to wait, wait for more marshmallows - For a whole bag I'd wait"
- "I'd wait longer if it was for money!"
- "I know that when it comes to money, I should save for tomorrow, but if I want something, I want it now."
- "Some times you don't want to overthink"
- "My phone is my marshmallow"

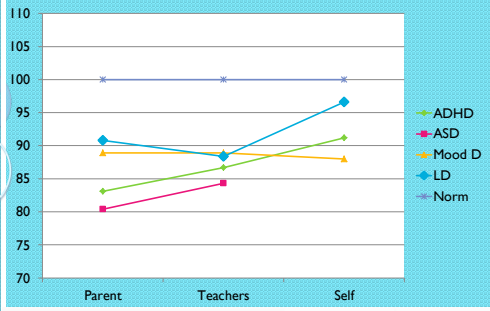
LEARNING & the BRAIN 79

CEFI Scores by Diagnosis

- We expected that those with ADHD, mood disorders, and Autism Spectrum Disorders might earn a low CEFI Full Scale score.
- LD students should not be as low
- We compared groups matched on gender, race/ethnicity, and parental education

Impairment in executive function is common in a number of internalizing and externalizing forms of psychopathology (Willcutt et al., 2005; see chapter 2, *Theory and Research*, for further discussion). For instance, research and theory has pointed to executive function deficits in Attention-Deficit/Hyperactivity Disorder (ADHD) and mood disorders (e.g., Weyandt et al., in press), as well as Autism Spectrum Disorders (ASD; e.g., Gilbert, Bird, Brindley, Frith, & Burgess, 2008; Gilotty, Kenworthy, Sirian, Black, & Wagner, 2002; Happé, Booth, Charlton, & Hughes, 2006; Ozonoff, Pennington, & Rogers, 1991; Solomon, Ozonoff, Ursu, Ravizza, Cummings, Ly, & Carter, 2009).

CEFI EF Scores by Group



LEARNING & the BRAIN 81

CEFI and BRIEF

- The CEFI and BRIEF were compared using 320 parent, teacher, and self-ratings
- BRIEF yields T scores (50;10) scaled so that high scores indicate poor EF
  - These scores were converted to the 100 & 15 metric and inverted so that both tests have the same scaling
- Group was diagnosed with ADHD

LEARNING & the BRAIN 82

Areas Operationalized: CEFI vs. BRIEF

CEFI		BRIEF	
Emotion Regulation	Control of emotions, staying calm when dealing with small problems, reacting with the right amount of emotion.	**Emotional Control**	Modulate emotional responses/mood appropriately
Flexibility	Ability to respond appropriately to changing or altered situations or different people/circumstances	**Shift**	Transition smoothly between or adapt to new activities/ situations; problem-solve flexibly
Impulse Control	Restraining impulses, reactions, or behavior	**Inhibit**	Control, delay or stop impulses/ behavior
Initiate	Willing exertion of physical or mental effort in pursuit of a goal	**Initiate**	Begin activity; generate ideas; start new tasks
Memory	Ability to store, retain, manipulate, & recall information	**Working Memory**	Hold information in mind to complete a task; sustain focus
Organization	Applying a structure or system for arranging or classifying objects & tasks; methodical and efficient behavior	**Organization of Materials**	Clean up after oneself
Planning	Holding a mental representation of intended action that guides behavior; outline of steps to complete a task/solve a problem	**Plan/Organize**	Anticipate future events; set goals; develop steps; grasp main ideas; think prospectively; follow a plan
Self/Performance Monitoring	Ability to attend to & evaluate ongoing behavior/outcomes to make necessary corrections for successful goal completion	**Monitor**	Check work; assess performance; monitor effect of behavior on others

83

CEFI and BRIEF Means ADHD

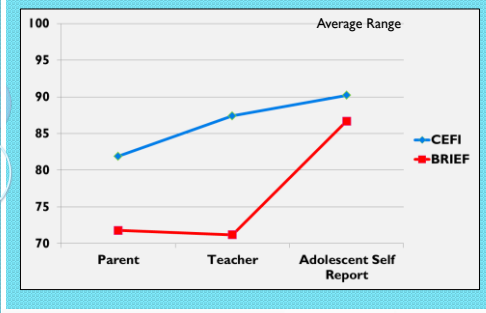
ADHD

	CEFI			BRIEF			Effect Size
Form	N	Mn	SD	N	Mn	SD	
Parent	57	81.9	11.7	57	71.8	13.7	.79
Teacher	51	87.4	11.1	51	71.2	23.7	.88
Self-Rating	32	90.2	14.2	32	86.7	15.9	.23

Note: Effect Sizes of .2 are considered small, .5 medium, and .8 large.

LEARNING & the BRAIN 84

CEFI and BRIEF: ADHD



Presentation Outline

- Comprehensive Model of EF
  - Historical Perspective
  - Definitions of Executive Function
- EF as Behavior
- EF as an Ability (an intelligence)
- EF as Social Emotional Skills
- Research about EF as ability, behavior, and SE
- **Think Smart!** -- EF Skills in the Classroom
  - More lesson plans for improving components of EF
- Conclusions

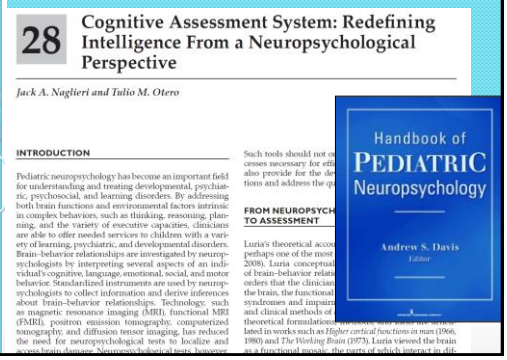
Learning and Intelligence

- 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 EF in the learning process

EF is a Brain-Based Ability

- EF is an ability by virtue of its relationship to the brain
- Because there is a relationship between BRAIN FUNCTION and BEHAVIOR, behaviors tell us about the ABILITY (sometimes…)
- EF skills are the result of EF Ability ***and*** well practiced behaviors that reflect EF
  - Not all abilities and not all behaviors involve EF

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

Handbook of PEDIATRIC Neuropsychology

Andrew S. Davis
Editor

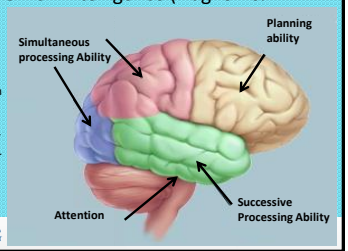
IQ defined by BRAIN function

- **P**ASS theory is a modern way to define 'ability' (AKA – intelligence)
- **P**lanning = THINKING ABOUT THINKING
- **A**ttention = BEING ALERT
- **S**imultaneous = GETTING THE BIG PICTURE
- **S**uccessive = FOLLOWING A SEQUENCE

Brain, Cognition, & Behavior

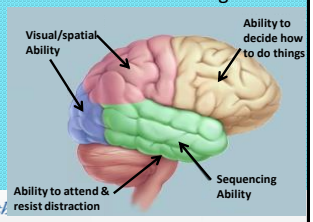
- The brain is the seat of abilities called PASS
- These abilities comprise what has been described as a modern view of intelligence (Naglieri & Otero, 2011)

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.



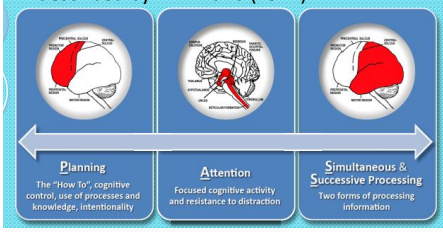
Brain, Cognition, & Behavior

- Different types of thinking (i.e. using different abilities) leads to different types of behavior.
- Good Frontal Lobe thinking leads to good decision making and better decisions about how to get things done.
- Poor Frontal Lobe thinking leads to problems with deciding how to think, act and relate to others



The Brain and Intelligence as PASS

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



Brain, Cognition, & Behavior

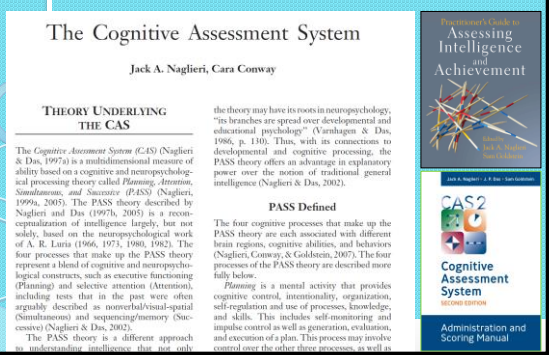
- **EF ability** is provided by the Frontal Lobes of the brain (an intelligence)
- **EF behaviors** are the result of experiences that influence likelihood that a person is strategic when doing things
- **EF Emotions** are the result of learning
- It is very important to measure EF Behaviors and EF Ability because they may be different

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

PASS For Teachers (www.kathleenkryza.com)

Measurement of EF as Intelligence



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 reconceptualization 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

Time to do a test of Planning

- You have a page called PC1 in your packet, please find it.
- **Look at the boxes at the top of the page. The letter A has XX, the letter B has OX, the letter C has XX** (point to the XX)**, and the letter D has OO. These are the codes that correspond to each letter**
- **Now look at the rest of the page where there are the letters A, B, C, and D, but there are no codes written under them. There are many boxes for you to complete. Fill in as many of these as you can, as fast as you can, using the answers shown at the top of the page. Do the first row, then the second row, and go from left to right without skipping any. You will have 60 seconds. Ready? Begin.**

Time to do a test of Planning

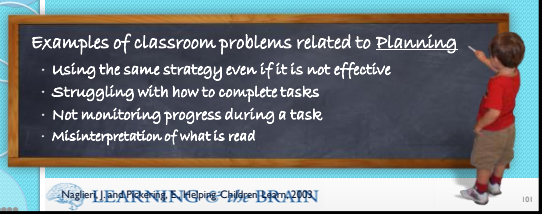
- Now turn to the second page (PC2) in your packet.
- **Look at this page. We're different answers for each letter. boxes at the top of the page. The letter A has OX, the letter B has XO, the letter C has OO** (point to the XX)**, and the letter D has XX.**
- **Fill in as many of the boxes on the rest of the page as fast as you can, using the answers shown at the top of the page**
- **You can do it any way you want. Let's see how many you can do. You will have 60 seconds.**
- **Ready, begin.**

Math Strategies

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

PASS Theory: Planning

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



Naglieri | Learning Disabilities | Helping Children Learn | 2013

Planning Lesson

- STEP 1 – View the video
- STEP 2 – Discuss the video with the person sitting next to you.
- STEP 3 – Share your ideas with everyone

Planning Lesson

- STEP 1 – View the video
- STEP 2 – Discussion of the video with someone sitting next to you.
- STEP 3 – Share your ideas with everyone

Time to Think and Talk

- **Task:**
- Talk with your partner(s)
  - **What had to happen so the people could dance together?**
  - **What are the parts of a plan?**
  - **How do you know if a plan is good?**
  - **What should you do if a plan isn't working?**
  - **How do we use planning in this class?**

START
120 seconds left
100 seconds left
80 seconds left
60 seconds left
40 seconds left
20 seconds left
STOP

STEP 3 – Share your ideas

Planning Lesson

Phrase of the week: What is your plan?

http://www.youtube.com/watch?v=bQLCZOG202k

1. What had to happen so that the people could dance together in this video?
2. What are the parts of a good plan?
3. How do you know if a plan is any good?
4. What should you do if a plan isn't working?
5. How do we use planning in this class?

Go to student learning log and create a plan for the week.

Planning Lesson Student responses

- Q: What would you have to plan out?
  - They had to learn the dance steps (knowledge)
  - Someone had to start dancing (initiation)
  - Permission from train station (planning)
- Q: What are the parts of a good plan?
  - Think of possible problems (strategy generation)
  - Organize the dance (organization)
  - Practice the dance steps (initiation)
  - Have a good idea of what to do (knowledge)

Planning Lesson Student responses

- Q3: How do you know if a plan is any good?
  - Put the plan in action and see if it works (self-monitoring)
  - Give it a try (perhaps learn by failing)

1. Q4: What should you do if a plan isn't working?
   1. Fix it. (self-correction)
   2. Go home ! (a bad plan)

Planning Lesson Student responses

Q5: How do you use planning in this class?

1. We don't plan in this class
2. Mrs. XXX does all the planning in this class so you don't have to think about planning

How might students react to being told that now they have to think and planning?

Like the Seinfeld video

This Planning Lesson

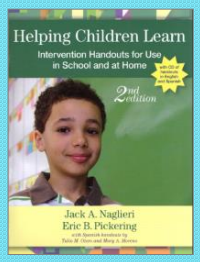
- This lesson brings to light the important distinction between planning over a long time (what was just shown) and real time planning

EF Instruction

- We use posters like this one to remind the students of the importance of PLANNING

Encourage Planning

- 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.

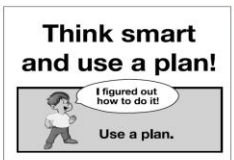
Step 1 – Talk with Students

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.

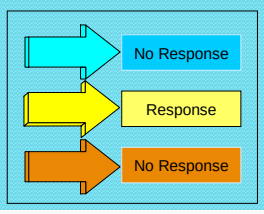
Do you have a favorite plan for learning spelling words? Do you use flashcards or go on the Internet to learn? Do you ask the teacher or another student for help? You can learn more by using a plan for studying that works best for you.



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!

PASS Theory

- **Attention** is a neurocognitive ability that a person uses to selectively attend to some stimuli and ignore others
  - selective attention
  - focused cognitive activity over time
  - resistance to distraction

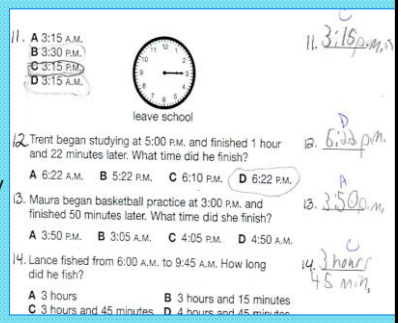


Attention Test Instructions:
You will see words like RED.
Your task: say the COLOR (green) not the word (red)

READY ?

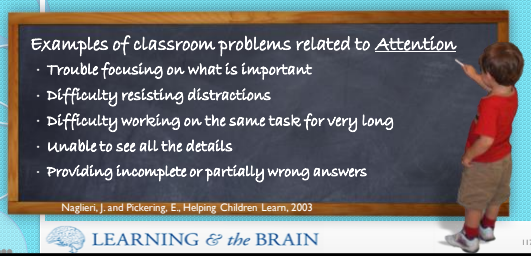
Attention

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



PASS Theory: Attention

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



Attention Lesson

- Start by making students aware of what attention is …
- View Attention video from Apollo Robbins
- Then provide Discussion
  - What did you learn from this video?
  - How can you attend better?
  - How can you resist distractions better?
- Then an Assignment – Make a list of times when you did well, and not so well, paying attention, noticing details, and resisting distractions.

Attention Lesson

- STEP 1 – View the video
- STEP 2 – Discuss the video with the person sitting next to you.
- STEP 3 – Share your ideas with everyone

Attention Lesson

- STEP 1 – View the video
- STEP 2 – Discussion of the video with someone sitting next to you.
- STEP 3 – Share your ideas with everyone

Time to Think and Talk

- **Task:**
- Time: 2 minutes
- Why do you think you were tricked by this video?
- How do you decide what to pay attention to, and what not to, in this class?
- What are you biggest distractions in class?
- What will you have the hardest time ignoring?

START
120 seconds left
100 seconds left
80 seconds left
60 seconds left
40 seconds left
20 seconds left
STOP

LEARNING & the BRAIN

Step 3 – Share your thoughts

Sustained Attention Lesson

Phrase of the week: Where is your focus?

Video: http://www.youtube.com/watch?v=jKCT-simmBo&noredirect=1

Q1: Why do you think you were tricked by this video?

Q2: How do you decide what to pay attention to, and what not to, in this class?

Q3: What are you biggest distractions in class? What will you have the hardest time ignoring?

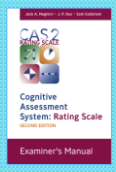
Hand out Learning Logs:

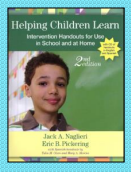
Students go to SA section and create a list they (or the class as a whole) will try to ignore this week.

LEARNING & the BRAIN 122

Planning and Attention = EF

- So far, the first two parts of the PASS theory fit nicely in the concept of EF
- How can EF behaviors be evaluated by the teacher?
  - Two methods…





LEARNING & the BRAIN 123

Helping Children Learn 2nd Edition

- Items scored in the Never and Sometimes columns should be used to build interventions
- Items 1-6 (Planning) and 14-18 (Attention) can be used for Executive Function

PASS Rating Scale (PRS)

Child's name: _____ Person completing the form: _____

Test date: _____ Relationship to the child: _____

Directions: This scale contains descriptions of behaviors that can help determine how well the child can use important cognitive processes. To use this scale, rate the questions on the basis of your knowledge of the child. Read each statement and put a checkmark under the word that tells how often you observed the behavior. If you want to change your answer, cross out your first response and fill in your new choice. Answer every question.

During the past 2 months, how often did the child	Always	Usually	Sometimes	Never
1. Work in a well-organized and neat way				
2. Use strategies and plans when doing work				
3. Evaluate his or her own behavior				
4. Think before acting				
5. Have many ideas about how to do things				
6. Show self-control				
7. Perform well on spatial activities (e.g., maps, diagrams)				
8. Understand how things go together				
9. See the big picture				
10. Understand complex verbal instructions				
11. Work well with patterns				
12. Like to use visual materials				
13. Focus well on one thing				
14. Work without being distracted by people or noises				
15. Pay close attention				
16. Listen to instructions without being distracted				
17. Work well for a long time				
18. Work well in a noisy environment				
19. Work well with information in sequence				
20. Do well with things presented step by step				
21. Remember the order of information				
22. Understand directions presented in sequence				
23. Do well working with sounds in order				
24. Closely follow directions presented in order				

Figure 3.11 The PASS Rating Scale.

LEARNING & the BRAIN 124

CAS2: Rating Scale Planning

Directions for Items 1–14. These questions ask how well the child or adolescent decides how to do things to achieve a goal. They also ask how well a child or adolescent thinks before acting and avoids impulsivity. Please rate how well the child or adolescent creates plans and strategies to solve problems.

During the past month, how often did the child or adolescent . . .	Never	Rarely	Sometimes	Frequently	Always
1. control his or her behavior?	0	1	2	3	4
2. produce a well-written sentence or a story?	0	1	2	3	4
3. evaluate his or her own actions?	0	1	2	3	4
4. produce several ways to solve a problem?	0	1	2	3	4
5. have many ideas about how to do things?	0	1	2	3	4
6. have a good idea about how to complete a task?	0	1	2	3	4
7. solve a problem with a new solution when the old one did not work?	0	1	2	3	4
8. use information from many sources when doing work?	0	1	2	3	4
9. complete work in an organized way?	0	1	2	3	4
10. effectively solve new problems?	0	1	2	3	4
11. accept feedback or corrections well?	0	1	2	3	4
12. have well-described goals?	0	1	2	3	4
13. think before acting?	0	1	2	3	4
14. consider new ways to finish a task?	0	1	2	3	4

125

CAS2: Rating Scale Attention

Directions for Items 30–43. These questions ask how well the child or adolescent pays attention and resists distractions. The questions also ask about how well someone attends to one thing at a time. Please rate how well the child or adolescent pays attention.

During the past month, how often did the child or adolescent . . .	Never	Rarely	Sometimes	Frequently	Always
30. direct his or her attention to one person at a time?	0	1	2	3	4
31. become easily absorbed in an activity?	0	1	2	3	4
32. work well in a noisy area?	0	1	2	3	4
33. stay with one task long enough to complete it?	0	1	2	3	4
34. focus when working alone?	0	1	2	3	4
35. not allow the actions or conversations of others to interrupt his or her work?	0	1	2	3	4
36. stay on task easily?	0	1	2	3	4
37. concentrate on a task until it was done?	0	1	2	3	4
38. listen carefully?	0	1	2	3	4
39. work without getting distracted?	0	1	2	3	4
40. have a good attention span?	0	1	2	3	4
41. listen to instructions or directions without getting off task?	0	1	2	3	4
42. pay attention in class?	0	1	2	3	4
43. attend to the details of a task?	0	1	2	3	4

126

Time to Think and Talk

- **Task:**
- Time: 2 minutes
- Fill out this form for a student you know
- Talk about the behaviors you have seen related to Executive Function
- Report back to the group

START
Take 5 minutes
5 minutes left
4 minutes left
3 minutes left
2 minutes left
1 minutes left
STOP

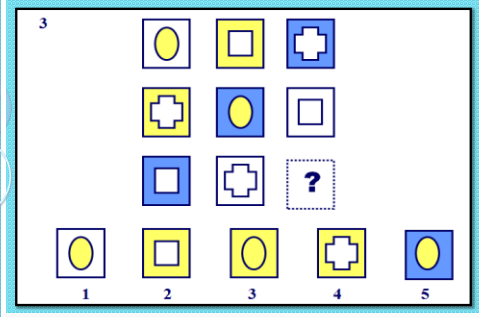
EF ability and the brain

- Planning and Attention have been included in conceptualizations of Executive Function
- The next two abilities are **not** related to EF
  - We will see what they are and …
  - See how we can improve performance when these abilities are required by using EF (strategies) to improve performance

PASS Theory

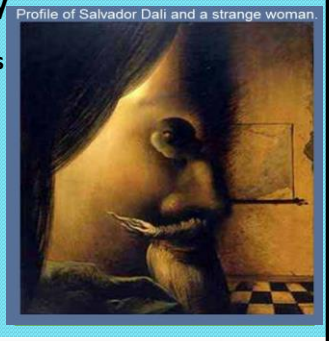
- **Simultaneous** is a neurocognitive ability a person uses to integrate stimuli into groups
  - Parts are seen as a whole
  - Each piece of information is related to others
  - Visual spatial tasks like blocks and puzzles on the Wechsler Nonverbal Scale
  - KABC Simultaneous Scale

Progressive Matrices

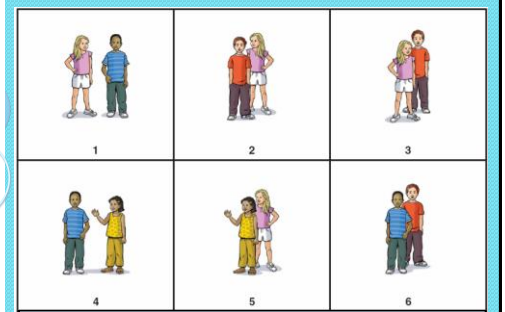


PASS Theory

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



Verbal-Spatial Relations

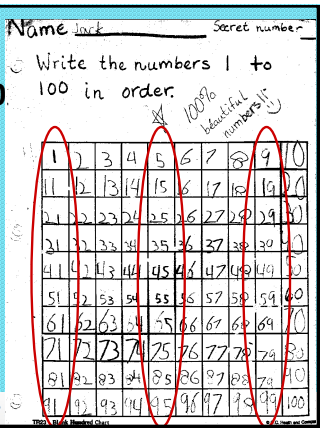


Which picture shows a boy behind a girl?

Numbers from 1 to 100

How can EF be brought to this Work sheet?

Use Simultaneous processing to see that patterns



PASS Theory: Simultaneous

Simultaneous Processing

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

Examples of classroom problems related to Simultaneous Processing

- Difficulty comprehending text
- Difficulty with math word problems
- Trouble recognizing sight words quickly
- Trouble with spatial tasks
- Often miss the overall idea

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

Use EF to manage low Simultaneous

- How do you help a child with low simultaneous ability?
- Teach students to USE STRATEGIES
- What kinds of strategies could you use for tasks that require seeing the whole?

Use EF

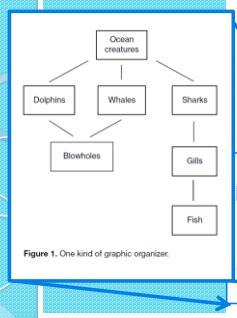
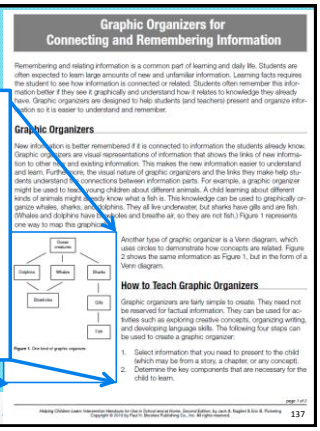


Figure 1. One kind of graphic organizer.

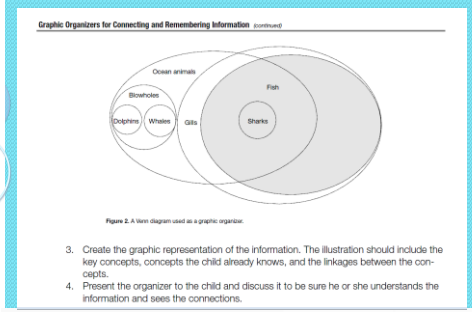


Graphic Organizers for Connecting and Remembering Information

Graphic Organizers

How to Teach Graphic Organizers

Venn Diagram



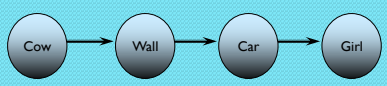
Graphic Organizers for Connecting and Remembering Information (continued)

Figure 2. A Venn diagram used as a graphic organizer.

3. Create the graphic representation of the information. The illustration should include the key concepts, concepts the child already knows, and the linkages between the concepts.
4. Present the organizer to the child and discuss it to be sure he or she understands the information and sees the connections.

Successive Processing Ability

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



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

Sentence Questions (Ages 8-17)

- The child answers a question read by the examiner

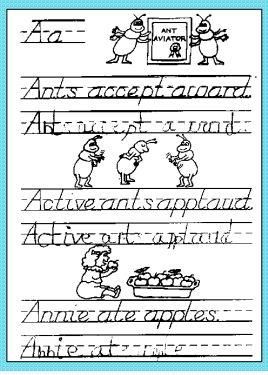
1. The blue is yellow. Who is yellow?

10. The red greened the blue with a yellow. Who used the yellow?

20. The red blues a yellow green of pinks, that are brown in the purple, and then grays the tan. What does the red do first?

Successive

The sequence of the sounds is emphasized in this work sheet



Learning Math Facts

8 + 9 = 17

8 + 9 = 17

8 + 9 = 17

PASS Theory: Successive

Successive Processing

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

Examples of classroom problems related to Successive Processing

- Trouble blending sounds to make words
- Difficulty remembering numbers in order
- Reading decoding problems
- Difficulty remembering math facts when they are taught using rote learning (4 + 5 = 9).

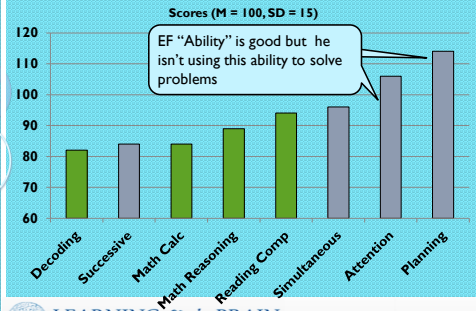
Naglieri, J. and Pickering, E., Helping Children Learn, 2003

Ben's Problem with Successive Processing

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

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

Ben's Problem with Successive processing Ability



LEARNING & the BRAIN 146

Case of Ben

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

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

LEARNING & the BRAIN 147

Ben's Problem with Successive Ability

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

LEARNING & the BRAIN 148

Time to Think and Talk

- **Task:**
- Talk with your partner(s) to answer the question: **"How can you bring Executive Function into a Successive processing task?**
- Time: 2 minutes

START
120 seconds left
100 seconds left
80 seconds left
60 seconds left
40 seconds left
20 seconds left
STOP

LEARNING & the BRAIN

Use EF with Sequencing Tasks

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!

Ben's Problem with Successive Ability

- Teach him to use his strength in Planning

How to Be Smart: Planning

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

What Does Being Smart Mean?

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

Ben's Problem with Successive Ability

- Teach him to recognize sequences

How to Teach Successive Processing Ability

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

Ben's Problem with Successive Ability

- 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 to translate letter sequences into sounds. This demands understanding the sounds represent and how letters work together to make sounds. Sometimes words can into parts for easier and faster reading. The word *into* is a good example because words that a child may already know: *in* and *to*. Segmenting words can be a help reading as well as spelling.

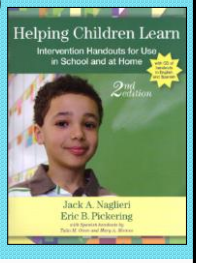
How to Teach Segmenting Words

Chunking & Spelling

An illustration

Use EF with Successive tasks

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



Use EF with Successive tasks

Chunking for Reading/Decoding

Plan	Action
Look at the word.	"I see the word *beginning*."
Find the chunk.	"I see the chunk *ginn* in the middle."
Sound out the chunk.	"I say, 'ginn.'"
Sound out the beginning.	"I say, 'be.'"
Sound out the chunk.	"I say, 'ginn.'"
Sound out the ending.	"I say, 'ing.'"
Say the word.	"I say, 'beginning.'"

Figure 1. Recommended organization of letter groups in a word.

ganizes the letters in groups of two, but that is not as easy to remember as *re-mem-ber* because it does not follow the way people naturally say the sounds.

Use EF with Successive tasks

Segmenting Words for Reading/Decoding and Spelling

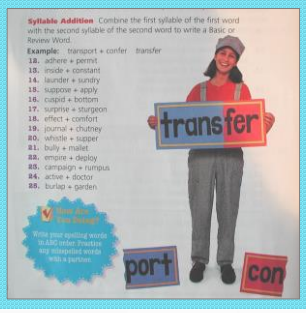
Decoding a written word requires the person to make sense out of printed letters and words and to translate letter sequences into sounds. This demands understanding the sounds that letters represent and how letters work together to make sounds. Sometimes words can be segmented into parts for easier and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

How to Teach Segmenting Words

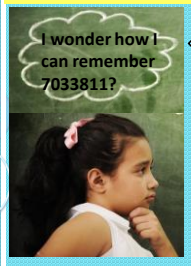
Segmenting words is an effective strategy to help students read and spell. By dividing the words into groups, students also learn about how words are constructed and how the parts are related to one another. Students should be taught that words can be broken down into segments or chunks. The teacher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

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

Segmenting Plan for Spelling

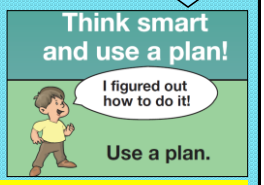


EF strategy changes the ……..→ Knowledge/skill



This requires Executive Function

Do This



When this strategy is well learned it becomes a skill

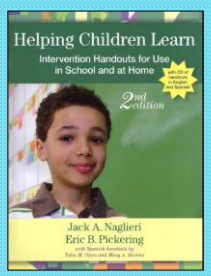
I can remember 7033811 easier if I put the numbers in groups: 70-33-811

Take Away Messages

- CAS Planning and Attention scores tell about Executive Function
  - So CAS *includes* EF as a critical part of ability (aka intelligence)
- Traditional IQ tests do not measure Executive Function
  - So EF is the important ability missed when you look at an IQ score

Teach Children about their Abilities

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

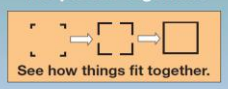


Four Ways to Think Smart!

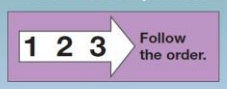
Think smart and use a plan!

Think smart and look at the details!

Think smart and put the pieces together!



Think smart and follow the sequence!



Take Away Messages

- CAS Planning and Attention scores tell about Executive Function
  - So CAS *includes* EF as a critical part of ability (aka intelligence)
- Traditional IQ tests do not measure Executive Function
  - So EF is the important ability missed when you look at an IQ score

Conclusions on PASS abilities and EF as ability /behavior /emotion

- The essential aspects of EF are subsumed under the Planning and Attention portions of the PASS theory of intelligence
- This includes:
  - **Initiation** to achieve a goal, **planning** and **organizing** parts of a task, **attending** to details to notice success of the solution, keeping information in **memory,** having **flexibility** to modify the solution as information from **self-monitoring** is received and demonstrating **emotion regulation** (which also demands **inhibitory control)** to ensure clear thinking so that the task is completed successfully.

Time to Think and Talk

- We have covered the ***EF as one part of intelligence***
- TALK TO YOUR NEIGHBORS about
  - What thoughts do you have about what has been presented
  - Any surprises?
  - Any concern?
  - Any questions?

Presentation Outline

- Comprehensive Model of EF
  - Historical Perspective
  - Definitions of Executive Function
- EF as Behavior
- EF as an Ability (an intelligence)
- EF as Social Emotional Skills
- Research about EF as ability, behavior, and SE
- **Think Smart!** -- EF Skills in the Classroom
  - More lesson plans for improving components of EF
- Conclusions

Phineas had Social Emotional deficit

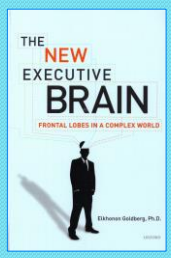
- Phineas had profound social emotional problems after his injury to the frontal lobes
- Phineas is
  - insulting
  - impulsively say things
  - uses vulgar language
  - can't manage his emotions
  - inconsistent in social situations
  - doesn't recognize he is offensive
  - looses control in interactions with others

Frontal Lobes

- Phineas has social and emotional problems
- Social emotional is often described using a variety of terms
  - Social emotional learning (CASEL)
  - Protective factors related to Resilience
  - Mental health
  - Behavior disorders
  - Emotional disturbance

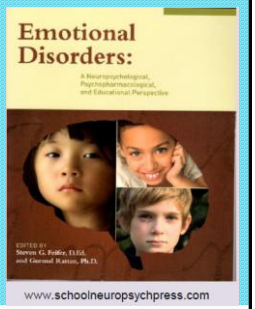
Frontal Lobes and Emotion

- Goldberg (2011, p 116-117)
  - the "emphasis in the classic studies of frontal lobe syndromes was on cognition [intelligence] rather than on affect [social emotional]"
  - 'very few researchers have attempted to merge cognitive and emotional aspects of frontal lobe dysfunction'



Feiffer & Rattan (2009)

- Provide a collection of paper on the relationship between EF and Emotional Disorders
- See Feifer@comcast.net



www.schoolneuropsychpress.com

Feiffer & Rattan (2009) on EF and Frontal Lobes

The Cerebral Orchestra of Emotions: Cortical Regions

(1) Orbitofrontal cortex - region of the brain responsible for ascribing an emotional valence or value judgment to another's feelings. Often triggers an automatic social skills response (Rolls, 2004).

Has rich interconnections with the limbic system by way of the *uncinate fasciculus*.

Responsible for *emotional executive functioning*.

Self-regulation of behavior..... highest levels of emotional decision making dictated by this brain reg

The Cerebral Orchestra of Emotions: Cortical Regions

(2) Ventrolateral prefrontal cortex – responsible for *response inhibition* and *emotional regulation*.

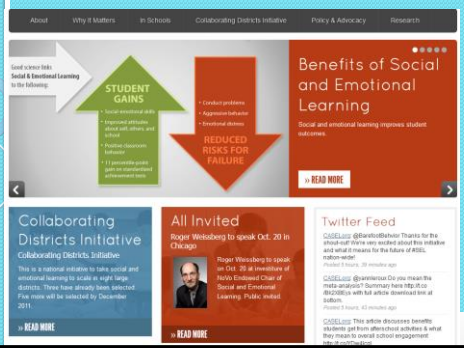
- Has rich interconnections with the limbic system.
- Also involved with *emotional executive functioning*.
- Situated adjacent to orbitofrontal cortex and involved in the ability to take another's perspective on an emotional event (*theory of mind*).

Social Emotional Skills: From Conceptual to Assessment to Instruction

Federal SEL Legislation

- HR 4223 – *"The Academic, Social and Emotional Learning Act."*
  - Establish a National Technical Assistance and Training Center for SEL
  - Provide grants to support evidence-based SEL programs
  - Conduct a national evaluation of SEL programs

www.casel.org



The Collaborative for Academic, Social and Emotional Learning

- CASEL is a nonprofit with a mission to:
- Advance the science of SEL
- Expand effective SEL practice in schools
- Improve state and federal policies
- Responsible for a recent Meta-analyses of the research (next slide)

Skills for Social and Academic Success

Research Links SEL to Higher Success

- 23% gain in SE skills
- 9% gain in attitudes about self/others/school
- 9% gain in pro-social behavior
- 11% gain on academic performance via standardized tests (math and reading)

And Reduced Risks for Failure

- 9% difference in problem behaviors
- 10% difference in emotional distress

Source: Durlak, J.A., Weissberg, R.P., Dymnicki, A.B., Taylor, R.D., and Schellinger, K. (2011). The Impact of Enhancing Students' Social and Emotional Learning: A Meta-Analysis of School-Based Universal Interventions. *Child Development, 82,* 405-432.

LEARNING & the BRAIN

Social Emotional Skills

Five key social-emotional skills from CASEL

These are in many state and local standards

What is Social and Emotional Learning?

The Collaborative for Academic, Social, and Emotional Learning (CASEL) describes SEL as the process of developing the following five sets of core competencies in the context of safe, caring, well-managed, academically rigorous, and engaging learning environments:

1. **Self-awareness**—being able to accurately assess one's feelings, interests, values, and strengths; maintaining a well-grounded sense of self-confidence
2. **Self-management**—being able to regulate one's emotions to handle stress, control impulses, and persevere in overcoming obstacles; setting and monitoring progress toward personal and academic goals; expressing emotions effectively
3. **Social awareness**—being able to take the perspective of and empathize with others; recognizing and appreciating individual and group similarities and differences; recognizing and using family, school, and community resources
4. **Relationship skills**—being able to establish and maintain healthy and rewarding relationships based on cooperation; resisting inappropriate social pressure; preventing, managing, and resolving interpersonal conflict; seeking help when needed
5. **Responsible decision-making**—being able to make decisions based on consideration of reason, ethical standards, safety concerns, social norms, respect for self and others, and likely consequences of various actions; applying decision-making skills to academic and social situations; contributing to the well-being of one's school and community.[1]

LEARNING & the BRAIN 177

U.S. Department of Labor

- Employers want:
  - Learning-to-learn skills
  - Listening and verbal communication
  - Creative thinking and problem solving
  - Personal management: self esteem, motivation
  - Group effectiveness: interpersonal skills, negotiation, teamwork
  - Organizational effectiveness and leadership
  - Competence in reading, writing, and computation

LEARNING & the BRAIN 178

NASP's Integrated and Comprehensive School Psychological Services Model

- School psychologists should have
  - knowledge of…evidence-based strategies to promote social-emotional skills
  - Use assessment methods.. that support socialization, learning and mental health
  - knowledge of varied methods of assessment for identifying social-emotional strengths and needs
  - use valid and reliable assessment techniques

LEARNING & the BRAIN 179

In Goldstein & Brookes (2013)

Measuring Resilience in Children: From Theory to Practice* 14

Jack A. Naglieri, Paul A. LeBuffe, and Katherine M. Ross

Introduction

The concept of resilience, like all psychological constructs, must have certain characteristics in order to be subjected to experimental testing so as to be effectively applied to benefit our constituency. A primary characteristic is that resilience must be operationally defined in a way that is reliable across time, subjects, and researchers. Once a concept is operationalized in a reliable manner, then its validity can be examined. When we have sufficiently operationalized the concept of resilience, and there is evidence that it can be measured in a reliable and valid way, then application in clinical and educational settings becomes possible. This is an ideal sequence for the development tools for testing new concepts, but it is not how many concepts and tests used in education and psychology have been promulgated.

In practice, there is great emphasis on helping clients and pressure to implement new approaches even if they have only been minimally tested. If an idea appears logical and appears to help clients then it seems reasonable to believe that the construct possesses validity, however ill-defined that may be. Unfortunately, what seems logical and consistent with clinical experience may not be true. As noted by Garb (2003, p. 32), "Results

LEARNING & the BRAIN 180

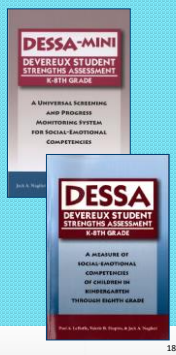
Quality of SEL Measures

Table 14.1 Psychometric characteristics of scales used to measure variables related to resilience

Rating scale	No. of items	Age range	Informants	Scores for scales	Comparison sample size	Sample description	Match to US population
Ages and Stages Questionnaire: Social–Emotional (ASQ-SE)	Varies	3–66 months	Parents	Raw score	2,633	National sample	No
Behavioral and Emotional Rating Scale (BERS)	52	6–9 years	Teachers, parents, self	Raw scores, percentiles, scales scores	2,176	National sample	Yes
Devereux Early Childhood Assessment (DECA)	37	2–5 years	Parents and teachers	*T*-score	2,000	National sample	Yes
Devereux Early Childhood Assessment—Clinical (DECA-C)	62	2–5 years	Parents and teachers	*T*-score	2,000	National sample	Yes
Devereux Early Childhood Assessment—Infant Toddler (DECA-IT)	33 (infant form) and 36 (toddler form)	1–36 months	Parents and teachers	*T*-score	2,183	National sample	Yes
Devereux Student Strengths Assessment (DESSA)	72	5–14 years	Parents and teachers	*T*-score	2,500	National sample	Yes
Devereux Student Strengths Assessment—Mini (DESSA-mini)	Four 8 item forms	5–14 years	Teachers	*T*-score	1,250	National sample	Yes
Devereux Student Strengths Assessment—Second Step Edition (DESSA-SSE)	36 items	5–14 years	Teachers	*T*-score	1,250	National sample	Yes
Penn Interactive Play Scale	32	preK & K	Parents and teachers	*T*-score	312	African American Head Start populations living in high-risk, low income urban populations	No
Preschool Behavioral and Emotional Rating Scale (preBERS)	42	3–6 years	Parents and teachers	Scaled scores	1,471	Typical preschool, head start, and early childhood special education	Yes
Resiliency Scales for Children and Adolescents (RSCA)	64	9–18 years	Self report	*T*-score	650	National sample	No

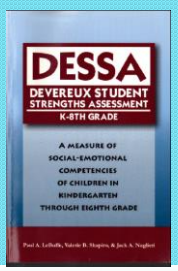
The DESSA Comprehensive System

- Universal screening with an 8-item, strength-based behavior rating scale, the *DESSA-mini*
  - Provides an overall measure of social-emotional competence for universal screening and ongoing progress monitoring
- Follow-up with at-risk students with the 72-item *DESSA* to identify specific areas of need



http://www.centerforresilientchildren.org/

Assessment of Social Emotional Skills with the DESSA



The DESSA

- Based on resilience theory & SEL principles described by CASEL
  - Identify social-emotional strengths and needs of elementary and middle school children (for K-8th grade)
  - 72 items and 8 scales
  - Completed by parents, teachers, and/or after-school / community program staff
  - Takes 15 minutes to complete
  - On-line administration, scoring and reporting available

DESSA Norms

- 2,475 children, grades K-8
- All 50 states included in sample
- Representative of US Population

TABLE 2.1

DESSA Standardization Sample Characteristics by Grade and Gender

	Males		Females		Total	
	n	%	n	%	n	%
Kindergarten	256	52.0	236	48.0	492	19.8
1st Grade	186	50.0	186	50.0	372	15.1
2nd Grade	161	50.0	161	50.0	322	13.1
3rd Grade	160	50.0	160	50.0	320	12.9
4th Grade	134	47.5	148	52.5	282	11.4
5th Grade	138	49.1	143	50.9	281	11.3
6th Grade	88	48.9	92	51.1	180	7.2
7th Grade	57	46.7	65	53.3	122	4.9
8th Grade	46	44.2	58	55.8	104	4.2
Total Sample	1,226	49.5	1,249	50.5	2,475	
U.S. %		51.2		48.8		

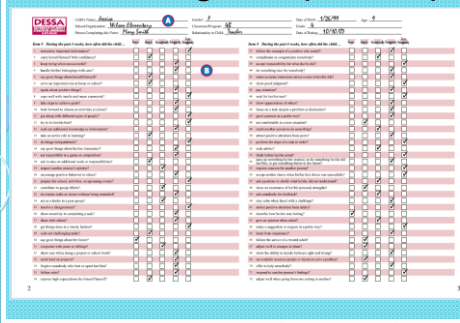
CASEL and DESSA Scales

1. **Self-awareness**—being able to ac… and strengths; maintaining a well…
2. **Self-management**—being able to… control impulses, and persevere… progress toward personal and ac…
3. **Social awareness**—being able to… others; recognizing and appreci… differences; recognizing and usin…
4. **Relationship skills**—being able t… relationships based on cooperati… preventing, managing, and resolv… needed
5. **Responsible decision-making**—b… consideration of reason, ethica… for self and others, and likely co… making skills to academic and so… one's school and community.[1]

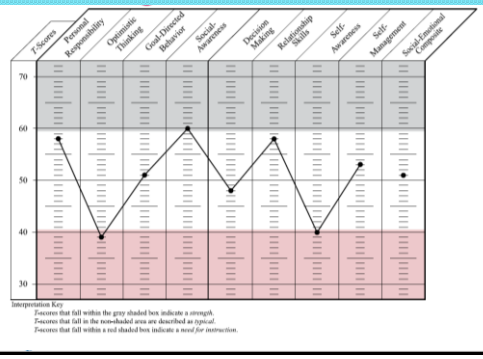
Social Emotional Composite

- Self Awareness
- Self Management
- Social Awareness
- Relationship Skills
- Decision Making
- Goal Directed Behavior
- Personal Responsibility
- Optimistic Thinking

DESSA Rating Form (72 items)

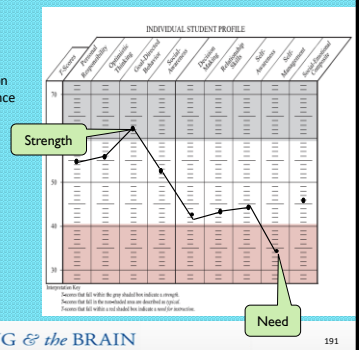


DESSA Individual Student Profile



Charles' Individual Student Profile

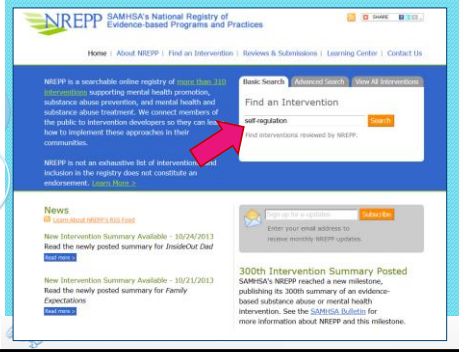
- Charles
  - 11 year old / 5th Grade
  - Special education student (EBD) since age 7
  - Born into foster care, adopted at age 2.5
  - History of behavioral concerns



Intervention

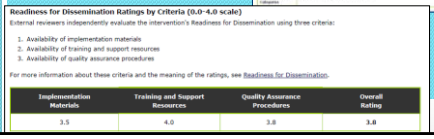
- Step 1 – identify goal(s) of most concern
- Step 2 – identify *relevant* strengths that can be leveraged
- Step 3 – identify strategy
  - Communicate by beginning with strengths
  - Many good existing curricula
  - SAMHSA
    - The National Registry of Evidence-Based Programs and Practices (http://nrepp.samhsa.gov)

http://nrepp.samhsa.gov



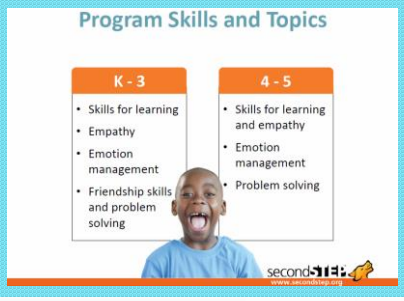
http://nrepp.samhsa.gov

- Research on this intervention is described and published references provided



Second Step Method for Teaching Social Emotional Skills

Second Step Method for Teaching Social Emotional Skills

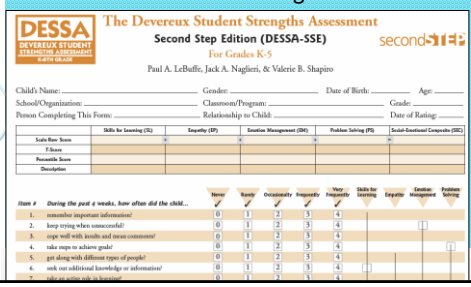


Second Step Method for Teaching Social Emotional Skills

Back of Lesson Card

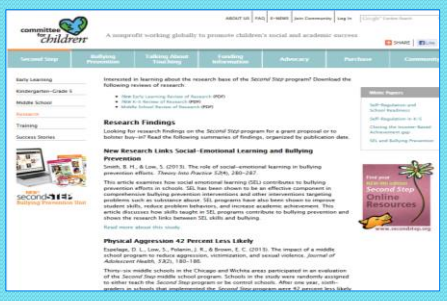
Treatment Effectiveness 2nd Step

- Pretest-Posttest Comparisons to evaluate the effectiveness of strategies



Effectiveness of Second Step

http://www.cfchildren.org/second-step/research.aspx



Universal Screening of Social-Emotional Skills

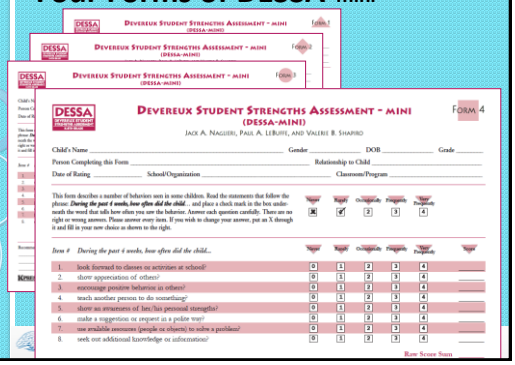
The DESSA-mini

- The DESSA-mini allows for:
  - Universal screening
  - Determination of need for instruction
- Four equivalent 8-item forms
  - Ongoing Progress Monitoring
  - Completed in 1-2 minutes by teachers
  - Yields one score – Social-Emotional Total Score

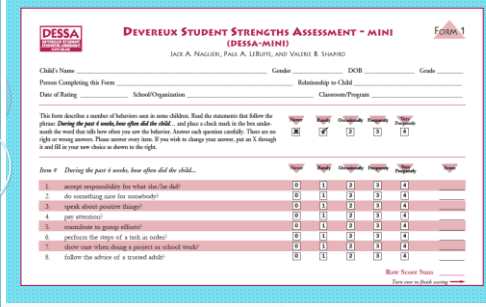
DESSA mini

- DESSA mini normative group
  - Standardization data for Teacher Raters (N = 1,249)
  - Region: NE = 24.6%; South = 39.1%; Midwest = 22.3%; West = 14.0%
  - 50.8% Males
  - Grades Kindergarten through 8

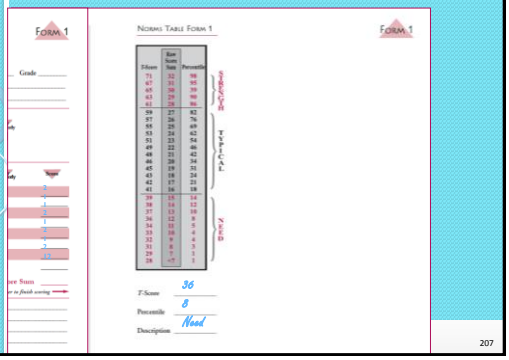
Four Forms of DESSA-mini



Fill Out a DESSAmini

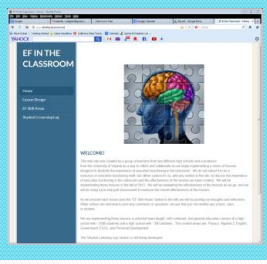


Four Forms of DESSA-mini

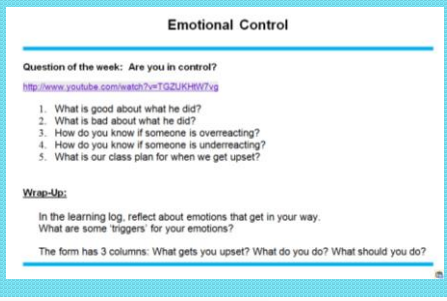


Other Lessons from www.efintheclassroom.net

Emotional Control



www.efintheclassroom.net



Emotional Control

Question of the week: Are you in control?

http://www.youtube.com/watch?v=TGZUKHW7vg

1. What is good about what he did?
2. What is bad about what he did?
3. How do you know if someone is overreacting?
4. How do you know if someone is underreacting?
5. What is our class plan for when we get upset?

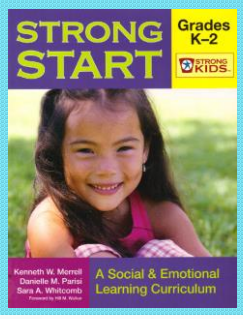
Wrap-Up:

In the learning log, reflect about emotions that get in your way. What are some 'triggers' for your emotions?

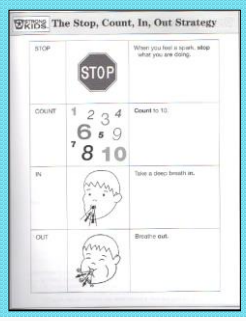
The form has 3 columns: What gets you upset? What do you do? What should you do?

Ken Merrell Strong Start

- Strong Start includes Social & Emotional learning curriculum for Kindergarten through 12th grade students



Ken Merrell Strong Start



Take Away Messages

- Social Emotional Skills are the result of EF and what the person has learned in all aspects of the environment
- Children CAN BE TAUGHT good, or bad, social emotional skills

Time to Think and Talk

- We have covered the ***EF as the foundation for social-emotional skills***
- TALK TO YOUR NEIGHBORS about
  - What thoughts do you have about what has been presented
  - Any surprises?
  - Any concern?
  - Any questions?

Presentation Outline

- Comprehensive Model of EF
  - Historical Perspective
  - Definitions of Executive Function
- EF as Behavior
- EF as an Ability (an intelligence)
- EF as Social Emotional Skills
- Research about EF as ability, behavior, and SE
- **Think Smart!** -- EF Skills in the Classroom
  - More lesson plans for improving components of EF
- Conclusions

Executive Function Behaviors, Intelligence, and Achievement test scores

EF and Achievement (Naglieri & Rojahn, 2004)

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 cog-

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

EF and Achievement (Naglieri & Rojahn, 2004)

- Correlation between Executive Function (Planning + Attention) and overall achievement (Skills Cluster) = **.51** (N = 1,559; $p < .001$)
- P&A added significantly to the prediction of achievement after Simultaneous and Successive scores were used in the regression equation

Table 3
Pearson Product-Moment Correlations Between the CAS Basic Battery and Standard Battery Full Scale Scores and the WJ-R Subscale and Cluster Scores (N = 1,559)

Scale	CAS Standard Battery subtests			
	Planning	Simultaneous	Successive	Attention
WJ-R subtests				
Letter-Word Identification	.47	.53	.49	.42
Passage Comprehension	.43	.50	.47	.39
Calculation	.50	.47	.36	.43
Applied Problems	.49	.60	.47	.44
Dictation	.50	.53	.49	.44
Word Attack	.41	.48	.44	.37
Reading Vocabulary	.42	.53	.50	.35
Quantitative Concepts	.51	.59	.49	.44
Proofing	.44	.48	.44	.40
WJ-R clusters				
Broad Reading	.48	.55	.50	.43
Basic Reading	.47	.54	.49	.42
Reading Comprehension	.44	.54	.50	.39
Broad Math	.54	.58	.45	.47
Basic Math	.55	.58	.46	.47
Math Reasoning	.49	.60	.47	.44
Basic Writing	.51	.55	.48	.45
Skills Cluster	.54	.62	.53	.48

Note. CAS = Cognitive Assessment System; WJ-R = Woodcock-Johnson Revised Tests of Achievement.

EF and Achievement (Best, et al, 2011)

Contents lists available at ScienceDirect

Learning and Individual Differences

journal homepage: www.elsevier.com/locate/lindif

Relations between executive function and academic achievement from ages 5 to 17 in a large, representative national sample

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ABSTRACT

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EF and Achievement (Best, et al, 2011)

- All Correlations Significant

Table 4
Correlations between EF subtests and WJ-R reading subtests.

Age	Letter-Word Identification			Passage Comprehension			Word Attack			Reading Vocabulary		
	MN	PC	PCn	MN	PC	PCn	MN	PC	PCn	MN	PC	PCn
5 (n = 181)	.36**	.32**	.32**	.42**	.39*	.41**	.35**	.27**	.38**	.42*	.39**	.34**
6 (n = 195)	.49**	.48**	.35**	.45**	.47**	.38**	.40**	.44**	.44**	.38**	.44**	.39**
7 (n = 203)	.33**	.41**	.32**	.35**	.38**	.31**	.41**	.42**	.35**	.39**	.41**	.29**
8–9 (n = 243)	.48**	.32**	.55**	.44**	.27**	.47**	.51**	.30**	.59**	.50**	.28**	.53**
10–11 (n = 191)	.50**	.32**	.47**	.49**	.31**	.44**	.43**	.30**	.45**	.47**	.26**	.47**
12–13 (n = 118)	.47**	.35**	.35**	.44**	.35**	.34**	.41**	.30**	.48**	.45**	.30**	.41**
14–15 (n = 124)	.31**	.18	.43**	.30**	.21*	.43**	.32**	.25**	.40**	.42**	.21*	.37**
16–17 (n = 140)	.36**	.34**	.40**	.41**	.33**	.40**	.46**	.41**	.51**	.51**	.40**	.47**

Note. MN = Matching Numbers; PC = Planned Codes; PCn = Planned Connections.
*p < .05 **p < .01.

EF, WISC-IV, CAS, Achievement

- Data from Sam Goldstein's evaluation center in Salt Lake City, UT
- Children given the WISC-IV (N = 43), CAS (N = 62), and the WJIII achievement (N = 58) as part of the typical test battery

Table 8.26. Demographic Characteristics of the CAS, WISC-IV, and WJ III ACH Validity Samples

Demographic		Sample					
		CAS		WISC-IV		WJ III ACH	
		N	%	N	%	N	%
Gender	Male	38	61.3	29	67.4	36	62.1
	Female	24	38.7	14	32.6	22	37.9
Race/Ethnic Group	Hispanic	1	1.6	1	2.3	1	1.7
	Asian	2	3.2	2	4.7	2	3.4
	White	55	88.7	38	88.4	52	89.7
	Other	4	6.5	2	4.7	3	5.2
Parental Education Level	High school diploma or less	1	1.6	0	0.0	1	1.7
	Some college or associate's degree	21	33.9	12	27.9	18	31.0
	Bachelor's degree or higher	36	58.1	26	60.5	34	58.7
	Missing information	4	6.5	5	11.6	5	8.6
Diagnostic or Educational Group	ADHD	24	38.7	15	34.9	20	34.5
	Anxiety	15	24.2	9	20.9	14	24.1
	ASD	7	11.3	5	11.6	7	12.1
	LD	3	4.8	3	7.0	3	5.2
	Mood	4	6.5	3	7.0	5	8.6
	Other	9	4.8	8	4.6	9	5.1
Total		62	100.0	43	100.0	58	100.0
Age *M* (*SD*)		10.4 (2.9)		10.2 (2.6)		10.5 (2.7)	

Note. ADHD = Attention-Deficit/Hyperactivity Disorder; Anxiety = Anxiety Disorder; ASD = Autism Spectrum Disorder; LD = Learning Disorder; Mood = Mood Disorder.

EF Behaviors (CEFI) & CAS

	WISC-IV				
	FS	VC	PR	WM	PS
CEFI					
Full Scale	.39	.44	.27	.30	.34

	CAS				
	FS	Plan	Sim	Att	Suc
CEFI					
Full Scale	.45	.49	.43	.37	.32

	WJ-III Achievement Tests				
CEFI Scales	Total	Broad Reading	Broad Math	Broad Written Language	Median
Full Scale	.51	.48	.49	.47	.49

Take Away Messages

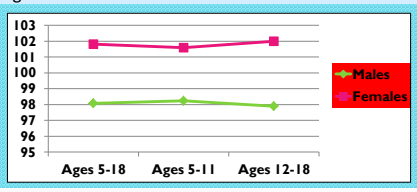
- EF behaviors are significantly correlated with scores from a nationally normed test of academic skills (WJ-III)
- EF behaviors are significantly correlated with all four PASS scales
- EF behaviors are mostly correlated with WISC-IV Verbal scale which requires a lot of knowledge

Sex Differences in Executive Function

CEFI Sex Differences: Parent Raters

- Girls are Smarter than Boys

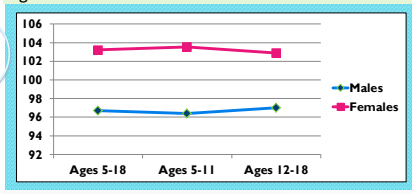
Parents	N	Mn	SD	N	Mn	SD	ES
Ages 5-18	700	**98.1**	14.9	699	**101.8**	15.0	**-0.25**
Ages 5-11	350	**98.2**	14.3	349	**101.6**	15.6	**-0.22**
Ages 12-18	350	**97.9**	15.4	350	**102.0**	14.4	**-0.28**



CEFI Sex Differences: Teacher Raters

- Girls are Smarter than Boys

Teachers	N	Mn	SD	N	Mn	SD	ES
Ages 5-18	700	**96.7**	14.4	700	**103.2**	15.0	**-0.44**
Ages 5-11	350	**96.4**	14.5	350	**103.5**	14.9	**-0.49**
Ages 12-18	350	**97.0**	14.4	350	**102.9**	15.0	**-0.40**



Sex Differences: Ability

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

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

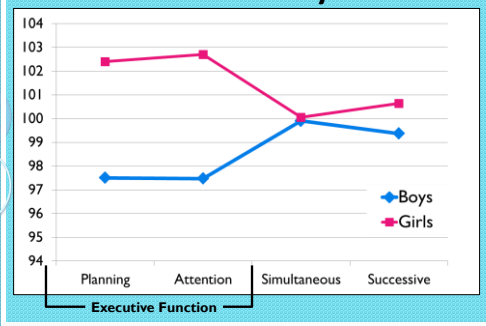
Gender Differences in Planning, Attention, Simultaneous, and Successive (PASS) Cognitive Processes and Achievement

Jack A. Naglieri
George Mason University

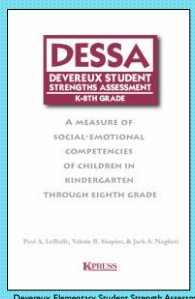
Johannes Rojahn
Ohio State University

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

Sex Differences: Ability



Sex Differences: Social Emotional



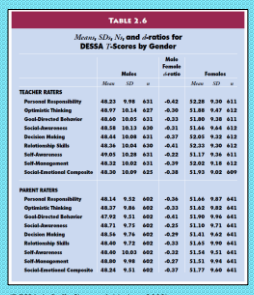


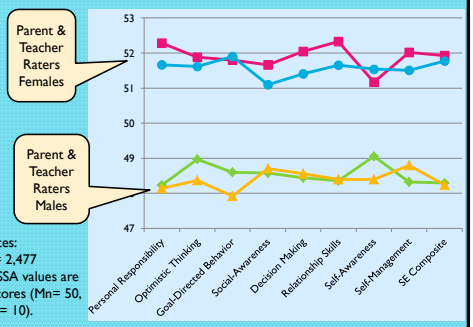
TABLE 2.6

Means, SDs, Ns, and *d*-ratios for DESSA *T*-Scores by Gender

	Males			Male-Female *d*-ratio	Females		
	Mean	*SD*	*n*		*Mean*	*SD*	*n*
TEACHER RATERS							
Personal Responsibility	48.33	9.98	631	-0.42	52.28	9.30	611
Optimistic Thinking	48.97	10.14	627	-0.30	51.88	9.47	612
Goal-Directed Behavior	48.60	10.05	631	-0.33	51.80	9.30	611
Social-Awareness	48.58	10.13	630	-0.31	51.66	9.64	612
Decision Making	48.44	10.08	631	-0.27	52.05	9.32	612
Relationship Skills	48.36	10.04	630	-0.41	52.32	9.30	612
Self-Awareness	49.05	10.28	631	-0.22	51.17	9.36	611
Self-Management	48.33	10.02	631	-0.39	52.02	9.18	612
Social-Emotional Composite	48.30	10.09	625	-0.38	51.92	9.02	609
PARENT RATERS							
Personal Responsibility	48.14	9.32	602	-0.36	51.66	9.87	641
Optimistic Thinking	48.37	9.86	602	-0.33	51.62	9.82	641
Goal-Directed Behavior	47.93	9.51	602	-0.41	51.90	9.96	641
Social-Awareness	48.71	9.73	602	-0.25	51.10	9.71	641
Decision Making	48.56	9.76	602	-0.29	51.41	9.62	641
Relationship Skills	48.40	9.72	602	-0.33	51.61	9.90	641
Self-Awareness	48.40	10.03	602	-0.32	51.54	9.51	641
Self-Management	48.00	9.98	602	-0.37	51.51	9.94	641
Social-Emotional Composite	48.34	9.51	602	-0.37	51.77	9.60	641

Devereux Elementary Student Strength Assessment (DESSA, LeBuffe Shapiro & Naglieri, 2009)

Sex Differences: Social Emotional



Notes:
N = 2,477
DESSA values are T-scores (Mn= 50, SD = 10).

Developmental Differences in Executive Function

Developmental Changes in EF

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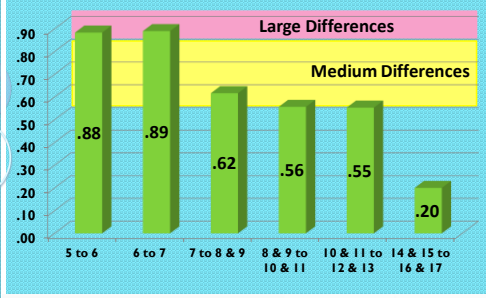
Developmental Changes in EF

- Best, et al (2011) reported means score differences between adjacent age groups of a large (N = 2, 036) nationally representative sample (CAS normative group)
- Results showed that EF does **not** develop consistently across the 5 year to 18 year age range
- Age differences were reported in effect sizes (.2 to .4 = small; .5 to .7 = medium; .8 and above = large)

Developmental Changes in EF



Developmental Changes in EF

- These developmental data suggest that instruction in EF Skills should be stressed when growth is most rapid, that is, during early elementary and middle school years
- Students need to be TOLD what EF is and how it can be used to help them learn, especially during the early years when growth in ABILITY is ….so that growth in BEHAVIOR and EMOTION follow

Take Away Messages

- As a group, boys need more help developing Executive Function skills than girls
- Because of the rapid growth of EF skills in the early grades -- intervene ASAP

Presentation Outline

- Comprehensive Model of EF
  - Historical Perspective
  - Definitions of Executive Function
- EF as Behavior
- EF as an Ability (an intelligence)
- EF as Social Emotional Skills
- Research about EF as ability, behavior, and SE
- **Think Smart!** -- EF Skills in the Classroom
  - More lesson plans for improving components of EF
- Conclusions

Kryza Practical EF Instruction

Practical Strategies for Developing Executive Functioning Skills for ALL Learners in the Differentiated Classroom

29

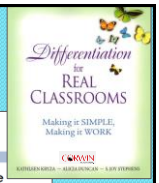
Kathleen Kryza

It's the first week of school for Alicia, a middle school teacher in a large school district in Michigan. She's been prepping for the first days of school for weeks, getting her room ready, and planning lessons. Last week she attended staff development sessions to learn about the new district and state initiatives and mandates that must be followed this year. Starting tomorrow, she will be immersed for the next 180 school days with a full day's schedule of three different preps—seven 50-minute classes with at least 32 students in each class. She can't imagine adding one more thing to her already overfull "To Do" list. But over the summer, Alicia read a book on teaching executive functioning skills to special needs learners. She really sees the value in teaching these important skills to her most at-risk students, but when can she possibly find time to do this? And how?

Alicia, like many teachers, understands the importance of developing executive functioning skills in her students, but given the full schedule of required academic content she needs to teach, that benefit all learners by looking at the skills

According to Judy Willis, a neurologist turned middle school teacher and international educational consultant, "We can identify the practices

Kryza et al (2011)



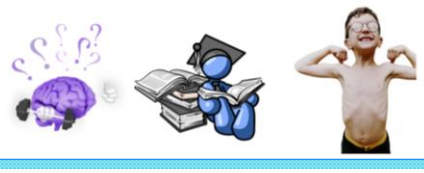
Intentional and Transparent

- YOU know WHY you are teaching what you are teaching (Intentional).
- STUDENTS know why they are learning what they are learning (Transparent).
- Talk the talk! Tell students:
  - What they are learning
  - Why it's important to learn
  - What strategies grow effective learners
  - Reflect on learning *with* your students
  - Notice and name how they learn and what strategies help them win the learning game.

Kryza et al (2011)

Winning Formula for Success in Your Co-Taught Classroom

Mindsets plus Skill Sets equals RESULTS!



Mindset Matters

- This work is about changing "HOW YOU DO WHAT YOU DO" (i.e. Executive Function)
- **Fixed mindset:**
  - Effort will not make a difference
  - You either get it or you don't.
- **Growth mindset:**
  - Dedication and hard work will pay off
  - A love of learning and a persistence is essential
  - Consistent effort makes a difference EVEN in the face of failure

Kryza et al (2011)

- Activities that reveal students' mindset
- Questions that help the teacher draw our the students' feelings

The following are possible activities you could use to have students feel their mindsets (*Developing Growth Mindsets in the Inspiring Classroom*, Kryza, Stephens, & Duncan, 2011):

- **Take a Quiz** (linguistic or logical): Give students a surprise quiz on what they've been learning in your class.
- **Try Toothpick Puzzles** (logical): Have students try to solve a toothpick puzzle. Many examples and solutions at various levels can be found at: http://www.madras.fife.sch.uk/departments/maths/toothpickworld/toothpick13s.html.
- **Tie Knots** (visual/tactile): Provide rope and written directions with no pictures and have students try tying knots.

Reflection: After each activity, ask students to respond to the following questions:

- So, how did you feel before you started this activity? What were you saying to yourself?
- What did you feel and say to yourself during the activity?
- How did you feel and speak to yourself after the activity?

Students then categorize their comments into growth or fixed mindset categories.

Kryza et al (2011)

- Guidelines for talking about mindset before, during and after working on a hard task

Before Learning

- Today you might find there are some things that are new to you and you are going to get to grow from trying them.
- Does this remind you of something you've done before? How can you use that experience to help you with this new learning?
- Looking at today's work, what part do you think will be the most challenging for you? What can you do when learning gets to the GOOD part (the hard part) to help you continue learning?

During Learning

- What parts are going well? What parts are making you grow?
- Why do you think this part is challenging for you? What do you need to help you? Do you need more information? More practice? A different way to practice?
- Have you done something like this before? What did you do when it got hard? Can you do it again?
- What do you know about yourself as a learner that can help you continue learning?

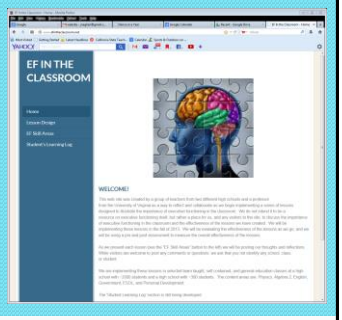
After Learning

- How did you grow as a learner?
- Did you learn something new about yourself and how you learn?
- Howcan you use that in the future when something gets tough?

EF Lessons for High School

www.efintheclassroom.net

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



EF Lesson Plan

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

EF Lesson Plan Logistics

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

EF Lesson Plan Logistics

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

EF Lesson Plan *Themes*

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

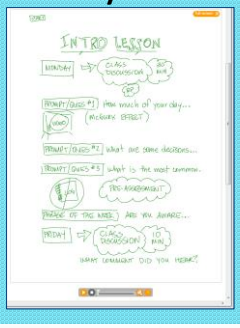
Structure of the lessons

- Each topic is discussed for one week
- Monday – class lesson
- Tues-Thurs reminders
- Friday – class reflection

EF Posters in the Class

Introductory Lesson: "Are you Aware"

- Ask for volunteers to NOT look at the video and report what word they hear



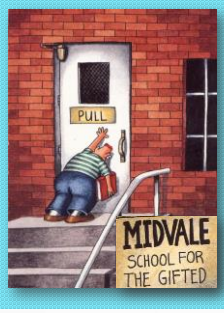
Time to Think and Talk

- **Task:**
- Time: 2 minutes
- This lesson is designed to help students be more observant
- When are you doing without being aware of subtle things your seeing?
- How does this fit to EF?

START
120 seconds left
100 seconds left
80 seconds left
60 seconds left
40 seconds left
20 seconds left
STOP

EF and Gifted/Talented Students

- Why do we see gifted students with low EF?
  - Because of the methods used to find them
- How do we help this student at the school for the gifted?



Using EF to Help with Attention

Frankie

Severe Attention Problem with poor academics and anxiety

Frankie – Attention

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

Frankie

- High level of anxiety
  - he was too anxious to look closely at the words, and he would rather get the task completed and move on.
  - Frankie could not attend to the details of the sequence of letters for correct spelling, and the order of sound–symbol associations

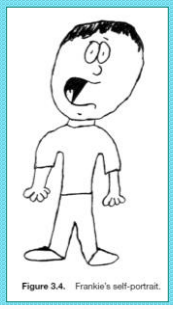
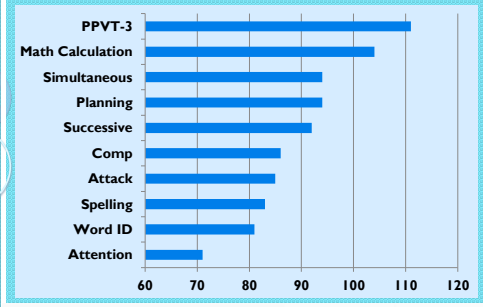


Figure 3.4. Frankie's self-portrait.

Frankie

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

Frankie



Frankie

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

What Should Teachers & Parents do?

How to Teach Students to Attend

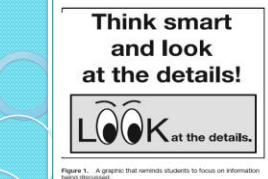


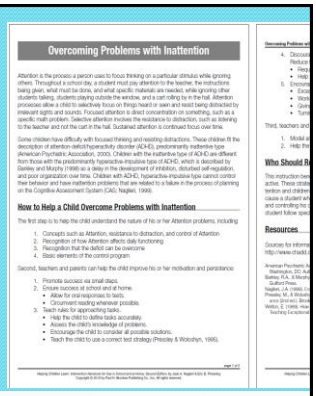
Figure 1. A graphic that reminds students to focus on information being discussed.

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

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

Frankie

Help Frankie use strategies (EF) to manage his attention problem



Overcoming Problems with Inattention

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

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

How to Help a Child Overcome Problems with Inattention

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

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

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

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

Frankie - Intervention

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

Frankie - Intervention

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

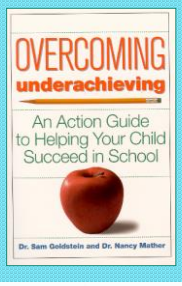
Frankie - Intervention

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

Frankie - Intervention

Improve resilience and self-esteem

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

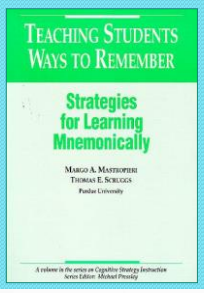


Frankie - Intervention

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

Mastropieri & Scruggs (1991)

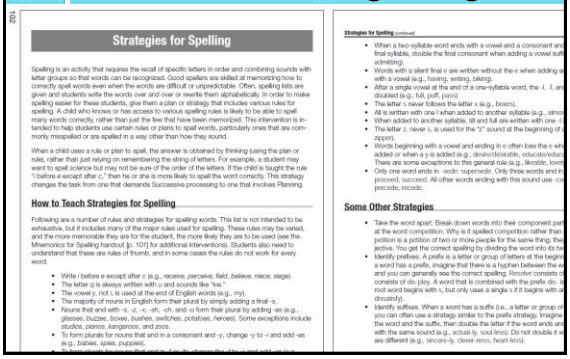
- Mnemonics are strategies:
  - for learning
  - for improving memory
- Topics include:
  - vocabulary, science, reading, spelling, math



Frankie

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

Frankie - Use Planning Strength



Strategies for Spelling

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

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

How to Teach Strategies for Spelling

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

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

Strategies for Spelling (continued)

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

Some Other Strategies

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

Frankie - Use Planning Strength

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

Segmenting Words for Reading/Decoding and Spelling

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

How to Teach Segmenting Words

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

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

What Should Teachers & Parents do?

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

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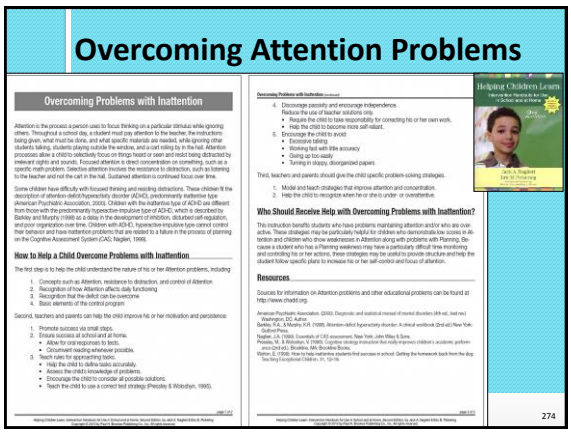
Overcoming Attention Problems



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   - Assess the child's knowledge of problems.
   - Encourage the child to consider all possible solutions.
   - Teach the child to use a correct test strategy (Pressley & Woloshyn, 1995).

4. Discourage passivity and encourage independence.
   Reduce the use of teacher solutions only.
   - Require the child to take responsibility for correcting his or her own work.
   - Help the child to become more self-reliant.
5. Encourage the child to avoid:
   - Excessive talking
   - Working fast with little accuracy
   - Doing up too easily
   - Turning in sloppy, disorganized papers

Third, teachers and parents should give the child specific problem-solving strategies.

1. Model and teach strategies that improve attention and concentration.
2. Help the child to recognize when he or she is under- or overstretched.

Who Should Receive Help with Overcoming Problems with Inattention?

This instruction benefits students who have problems maintaining attention and/or who are overactive. These strategies may be particularly helpful for children who demonstrate low scores in Attention and children who show weaknesses in Attention along with problems with Planning. Because a student who has a Planning weakness may have a particularly difficult time monitoring and controlling his or her actions, these strategies may be useful to provide structure and help the student follow specific plans to increase his or her self-control and focus of attention.

Resources

Sources for information on Attention problems and other educational problems can be found at http://www.chadd.org.

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text rev.). Washington, DC: Author.

Barkley, R., & Murphy, K.R. (1998). *Attention-deficit hyperactivity disorder: A clinical workbook* (2nd ed.) New York: Guilford Press.

Naglieri, J.A. (1999). *Essentials of CAS assessment*. New York: John Wiley & Sons.

Pressley, M., & Woloshyn, V. (1995). *Cognitive strategy instruction that really improves children's academic performance* (2nd ed.). Brookline, MA: Brookline Books.

Walton, E. (1998). How to help inattentive students find success in school. Getting the homework back from the dog. *Teaching Exceptional Children, 31*, 12–16.

Overcoming Attention Problems

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- Level II: Improve Motivation & Persistence
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- Discourage passivity / encourage independence
  - Teacher should only provide as much assistance as is needed
  - Discourage exclusive use of teacher's solutions
  - Child needs to correct own work
  - Child needs to learn to be self-reliant (Scheid, 1993)
- Frankie became very self-reliant – VERY IMPORTANT as shown in the next slide

Teach Self-reliance

- Students with any kind of learning challenge and many without any limitations need to be self-reliant
- Show the Stuck on the Escalator video
- Discuss what the message is with the students

Time to Think and Talk

- **Task:**
- Time: 2 minutes
- Discuss
  - Why were the people unable to do something?
  - What life experiences likely made them rely on others to fix their problem?

START	120 seconds left
	100 seconds left
	80 seconds left
	60 seconds left
	40 seconds left
	20 seconds left
	STOP

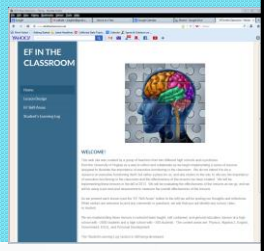
Stuck on the Escalator

- "A student in 4th period (we are doing the EF lessons in that class) was working in her Chemistry class (that teacher is NOT doing the EF lessons) spontaneously said, "Man, I am stuck on the escalator" (a phrase of the week) even though that phrase is not used in Chem. I took this as evidence that the (cuing) skills being learned in one class are transferring to another. It is encouraging."

Other Lessons from www.efintheclassroom.net

www.Efintheclassroom.net

Research support?



www.efintheclassroom.net

Planning Lesson

Phrase of the week: What is your plan?

http://www.youtube.com/watch?v=bQLCZOG202k

1. What had to happen so that the people could dance together in this video?
2. What are the parts of a good plan?
3. How do you know if a plan is any good?
4. What should you do if a plan isn't working?
5. How do we use planning in this class?

Go to student learning log and create a plan for the week.

Planning

Teaching Students About Planning

How Learning Depends on Planning Ability

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

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

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

How to Teach Planning

Think smart and use a plan!

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

Planning

Planning Facilitation for Math Calculation

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

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

How to Teach Planning Facilitation

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

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

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Effectiveness of a Cognitive Strategy Intervention in Improving Arithmetic Computation Based on the PASS Theory

Jack A. Naglieri and Deanne Johnson

Abstract

The purpose of this study was to determine if an instruction designed to facilitate planning, given by teachers to their class as a group, would have differential effects depending on the specific Planning, Attention, Simultaneous, Successive (PASS) cognitive characteristics of each child. A cognitive strategy instruction that encouraged planning was provided to the group of 19 students with learning disabilities and mild mental impairments. All students completed math worksheets during 7 baseline and 14 intervention sessions. During the intervention phase, students engaged in self-reflection and verbalization of strategies about how the arithmetic computation worksheets should be completed. The sample was sorted into one experimental and four contrast groups after the experiment was completed. There were four groups with a cognitive weakness in each PASS scale from the Cognitive Assessment System and one group with no cognitive weakness. The results showed that children with a cognitive weakness in Planning improved considerably (large effect size of 1.4), in contrast to those with a cognitive weakness in Attention (small effect size of 0.3), Simultaneous weakness (a slight deterioration and effect size of -0.2), Successive weakness (medium effect size of 0.4), and no cognitive weakness (small effect size of .2). These data showed that children with a Planning weakness benefitted from the instruction designed to help them be more planful. Those childrne who received the planning-based instruction who were not low inplanning did not show the same level of improvement.

Children with PASS Profiles

- 21 children with LD and mild mental impairments
- Teachers followed Planning Facilitation method described by Naglieri and Gottling (1997, 1997)
- Students were given instruction that facilitated the use of Planning

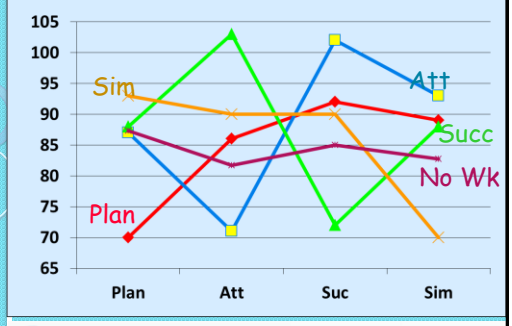
Illustration of a Math Worksheet Used in this Study.

Name:		Page 1	2	12	5	1	2
Date:			2	12	14	10	3
			+	+	+	+	+
988	98,923	7,344	5	6	3	3	13
- 335	287	- 3,740	5	13	3	5	26
	-						
15	50	154					
X 1	X 2	X 68	5	18	24	25	13
			-	-	-	-	-
			11	1	3	3	5
864	99,979	9,424	11	5	6	3	9
+ 192	+ 241	+ 6,430					
83,052	71,085	81,747	9	9	7	7	8
- 44,247	24,408	- 12,688	9	13	11	11	9
	-		-	-	-	-	-
			3	10	4	1	4
1304	934	1918	5	14	9	6	7
X 39	X 533	X 767					

Children with PASS Profiles

- Naglieri & Johnson (1998)
  - Seven 10-minute Baseline sessions
  - Fourteen 10-minute Intervention sessions
  - Children completed math computation worksheets that came from the curriculum
  - Children with a cognitive weakness in each of the PASS areas were identified
  - Cognitive Weakness = significant PASS ipsative score *and* the weakness must be a score < 90.

Cognitive Weaknesses



Children with PASS Profiles

	# Correct Baseline	Inter-vention	% Change	Effect Size
Plan				
Sim				
Att				
Suc				
NoCW	26	29	11	0.2

Note: Total number correct for all 7 sessions. 7 baseline, 14 intervention sessions (intervention number correct was weighted by .5). The % change = (Int - Base) /Base. Effect sizes are averages across subjects using (mean Int - mean Base) / SD baseline.

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http://journaloflearningdisabilities.sagepub.com
SAGE

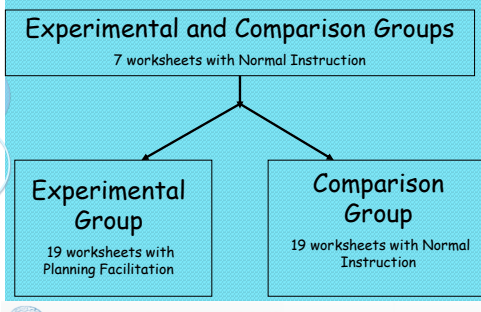
A Cognitive Strategy Instruction to Improve Math Calculation for Children With ADHD and LD: A Randomized Controlled Study

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

Abstract

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

Design of the Study



Instructional Sessions

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

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

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Normal Instruction and Planning Facilitation Sessions

- Normal Instruction
  - 10 minute math worksheet
  - 10 - 20 of math instruction
  - 10 minute math worksheet
- Planning Facilitation
  - 10 minute math worksheet
  - 10 minutes of planning facilitation
  - 10 minute math worksheet

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Planning Strategy Instruction

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

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Student Plans

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

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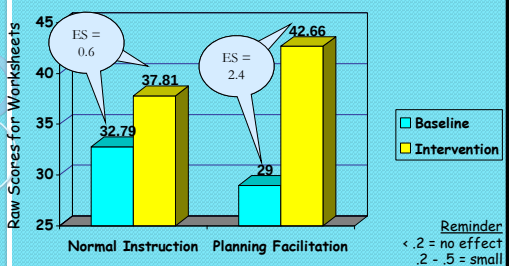
Worksheet Means and Effect Sizes for the Students with ADHD



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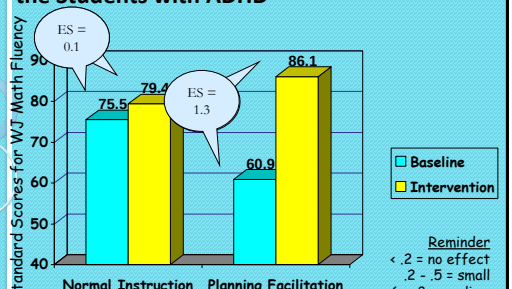
WJ Math Fluency Means and Effect Sizes for the Students with ADHD



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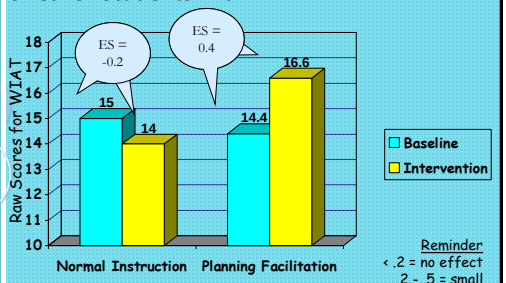
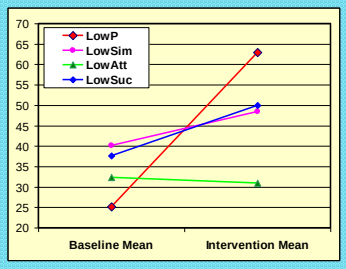
WIAT Numerical Operation Means and Effect Sizes for Students with ADHD



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

Iseman (2005)

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



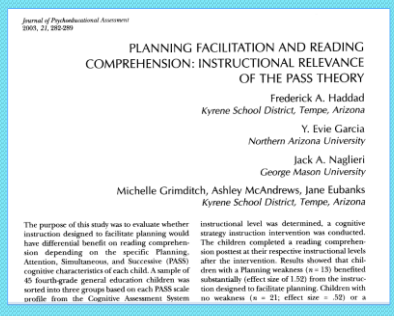
One Year Follow-up

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

Instructional Implications

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

EF and Reading Comprehension



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2003, 21, 282-289

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

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The purpose of this study was to evaluate whether instruction designed to facilitate planning would have differential benefit on reading comprehension depending on the specific Planning, Attention, Simultaneous, and Successive (PASS) cognitive characteristics of each child. A sample of 45 fourth-grade general education children was sorted into three groups based on each PASS scale profile from the Cognitive Assessment System instructional level was determined, a cognitive strategy instruction intervention was conducted. The children completed a reading comprehension posttest at their respective instructional levels after the intervention. Results showed that children with a Planning weakness (n = 13) benefited substantially (effect size of 1.52) from the instruction designed to facilitate planning. Children with no weakness (n = 21; effect size = .52) or a

Planning Facilitation & Reading

- 45 fourth grade general education children occurred
- The children completed a reading comprehension pre and posttest at their respective instructional levels
- The sample was sorted into one experimental
  - a weakness in planning group
- Two contrast groups
  - a weakness in successive processing
  - and no PASS weakness

EF and Reading Comprehension

- Haddad et al., (2003) helped children see the value of strategies when doing a reading comprehension task

The classroom teacher led the two 30-minute Planning Facilitation intervention sessions. The teacher initiated discussion for the first 5 minutes, asking six different children to describe the procedure during the reading pretest. The procedure was recalled and presented accurately by the children. Next, the teacher led the remainder of each intervention by saying, "This Friday each of you will read another passage and answer questions about it the same way you did the first time. I want you to think about how you can answer more questions correctly." The teacher facilitated discussion that encouraged the children to consider ways to be more successful but made no direct statements such as "That is correct" or "Remember to use that strategy," nor did the teacher provide any direct reading instruction.

Planning Facilitation & Reading

- The following probes were used by the author when deemed appropriate.
  - Talk about how you completed them.
  - Why did you do it that way?
  - What can be done to get more correct?
  - What else did you notice about the questions?
  - What will you do next time?

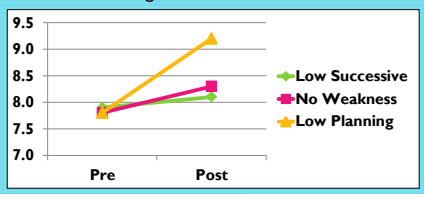
EF and Reading Comprehension

- Teachers helped children reflect on how they did the task

The role of the teacher was to help the children reflect on how they completed the reading comprehension task and to help clarify what was said and encourage self-reflection. The teacher used the following probes when appropriate: "Talk about how you completed them. Why did you do it that way? What can be done to get more correct? What else did you notice about the questions? What will you do next time?" The children made responses during the two intervention sessions as follows: "Read slower to remember better. Think back in your head. Try to remember important parts. Read slower and get it in your mind. Don't get distracted. Read the story more carefully. Think of the best answer. Answer from words in the story. Think back. Try to remember in your eyes. Listen to what the story is about as I read."

Planning Facilitation & Reading

	Pre	Post	Effect Size
Low Successive	7.9	8.1	0.1
No Weakness	7.8	8.3	0.4
Low Planning	7.8	9.2	1.6

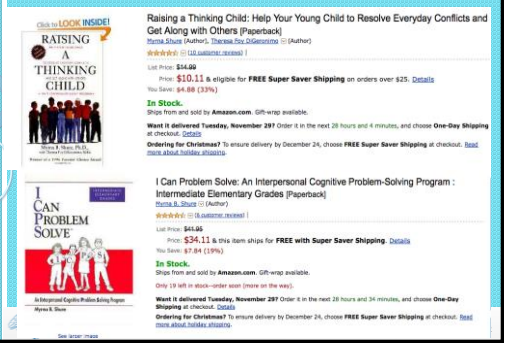


Cognitive Strategy = EF Instruction

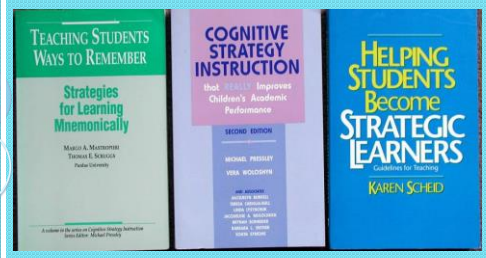
- A strategy is a procedure that the learner uses to perform academic tasks
- Using a strategy means the child thinks about 'how you do what you do'
- Successful learners use many strategies.
- Some of these strategies include visualization, verbalization, making associations, chunking, questioning, scanning, using mnemonics, sounding out words, and self-checking and monitoring.

EF Instruction

Cognitive Strategy = EF Instruction



Cognitive Instructional Methods



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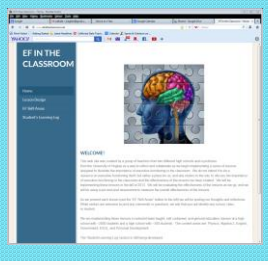
Other Lessons from www.efintheclassroom.net

Working Memory Lesson



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What is Working Memory

- Georgiou, Das, and Hayward (2008) described ***working memory*** as the capacity of the individual to store information for a short period of time and manipulate it using a phonological loop and visual–spatial sketchpad (Baddeley & Hitch, 1974)
- The ***visual–spatial sketchpad*** is described as a mental image of visual and spatial features (Engle & Conway, 1998)
- The ***phonological loop*** refers to retention of information from speech-based systems that are particularly important when order of information is required (Engle & Conway, 1998)

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Working Memory Game

- You will see a series of words presented at 2 per second. The words are from two different categories. For example, Man - Hammer - Boat - Woman, would be organized into Man and Woman (people), Hammer and Saw (tools)
- When you see the STOP sign, that is the time for you will write the words down in two columns.

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Put the words into groups. Write them down.

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Time to Think and Talk

- **Task:**
- Time: 2 minutes
- What Strategies did you use?
- Who do you know about how you learn?

START
120 seconds left
100 seconds left
80 seconds left
60 seconds left
40 seconds left
20 seconds left
STOP

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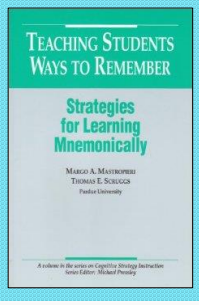
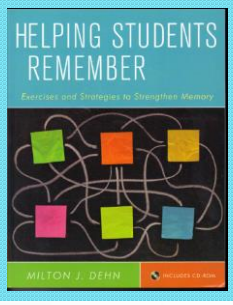
Memory Training Engages EF





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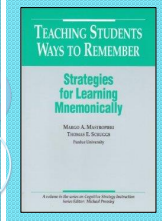
319

Mnemonics for sequence



- Mnemonics are EF strategies that help students remember

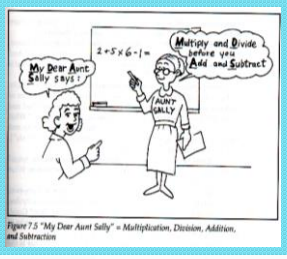


Figure 7.5 "My Dear Aunt Sally" = Multiplication, Division, Addition, and Subtraction

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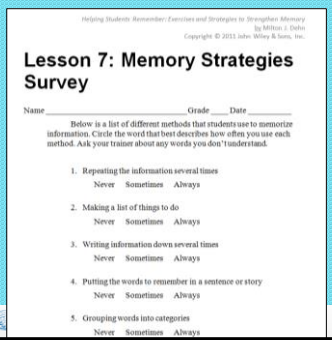
320

Teaching Students What Works For Them

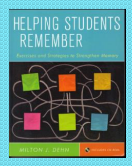


Lesson 7: Memory Strategies Survey

Name _____ Grade ____ Date _____

Below is a list of different methods that students use to memorize information. Circle the word that best describes how often you use each method. Ask your trainer about any words you don't understand.

1. Repeating the information several times
   Never Sometimes Always
2. Making a list of things to do
   Never Sometimes Always
3. Writing information down several times
   Never Sometimes Always
4. Putting the words to remember in a sentence or story
   Never Sometimes Always
5. Grouping words into categories
   Never Sometimes Always



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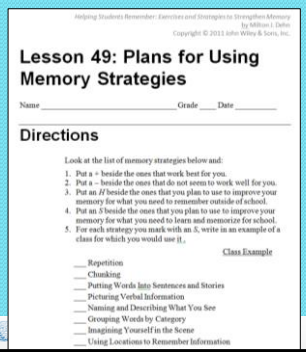
321

Teaching Students What Works For Them



Lesson 49: Plans for Using Memory Strategies

Name _____ Grade ____ Date _____

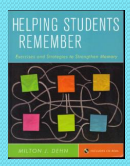
Directions

Look at the list of memory strategies below and:

1. Put a + beside the ones that work best for you.
2. Put a – beside the ones that do not seem to work well for you.
3. Put an *H* beside the ones that you plan to use to improve your memory for what you need to remember outside of school.
4. Put an *S* beside the ones that you plan to use to improve your memory for what you need to learn and memorize for school.
5. For each strategy you mark with an *S*, write in an example of a class for which you would use it.

Class Example

___ Repetition
___ Chunking
___ Putting Words Into Sentences and Stories
___ Picturing Verbal Information
___ Naming and Describing What You See
___ Grouping Words by Category
___ Imagining Yourself in the Scene
___ Using Locations to Remember Information



322

Time to Think and Talk

- **Task:**
- Time: 2 minutes
- Talk with your partner and make a list of all the mnemonics you use to remember things
- And all the things you do to help you remember
- **REPORT TO THE GROUP**

START
120 seconds left
100 seconds left
80 seconds left
60 seconds left
40 seconds left
20 seconds left
STOP

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Benefits of Strategy Instruction

- Students trust their minds
- Students know there is more than one right way to do things
- They acknowledge their mistakes and try to rectify them
- They evaluate their products and behavior
- Memories are enhanced
- Learning increases
- Self-esteem increases
- Students feel a sense of power
- Students become more responsible
- Work completion and accuracy improve
- Students develop and use a personal study process
- They know how to "try"
- On-task time increases: students are more "engaged"

Presentation Outline

- Comprehensive Model of EF
  - Historical Perspective
  - Definitions of Executive Function
- EF as Behavior
- EF as an Ability (an intelligence)
- EF as Social Emotional Skills
- Research about EF as ability, behavior, and SE
- **Think Smart!** -- EF Skills in the Classroom
  - More lesson plans for improving components of EF
- Conclusions

Conclusions

- The concept of EF is evolving
- CEFI results indicate that when measured using observable behaviors the term Executive Function is supported
- CEFI provides a well normed measure of EF that has demonstrated reliability & validity
- There is evidence that children can better use EF and improve achievement and behavior

Conclusions-- on Education

- Benjamin Franklin – Tell me and I forget. Teach me and I remember. Involve me and I learn.
- Teacher's role is to give only as much help as is necessary, **NOT to be the frontal lobes for the student**

Conclusions

- The teacher's role is to give the student knowledge of facts ***and*** to encourage the use of Executive Function
- When we give students the responsibility to figure out how to do things we teach them to **THINK SMART! and use EF**
- **This is the gift of smarter thinking**
- **This is a gift of optimism**
- **This is a gift for life success**
- **EF is about LIFE not just school**

Thank you for attending